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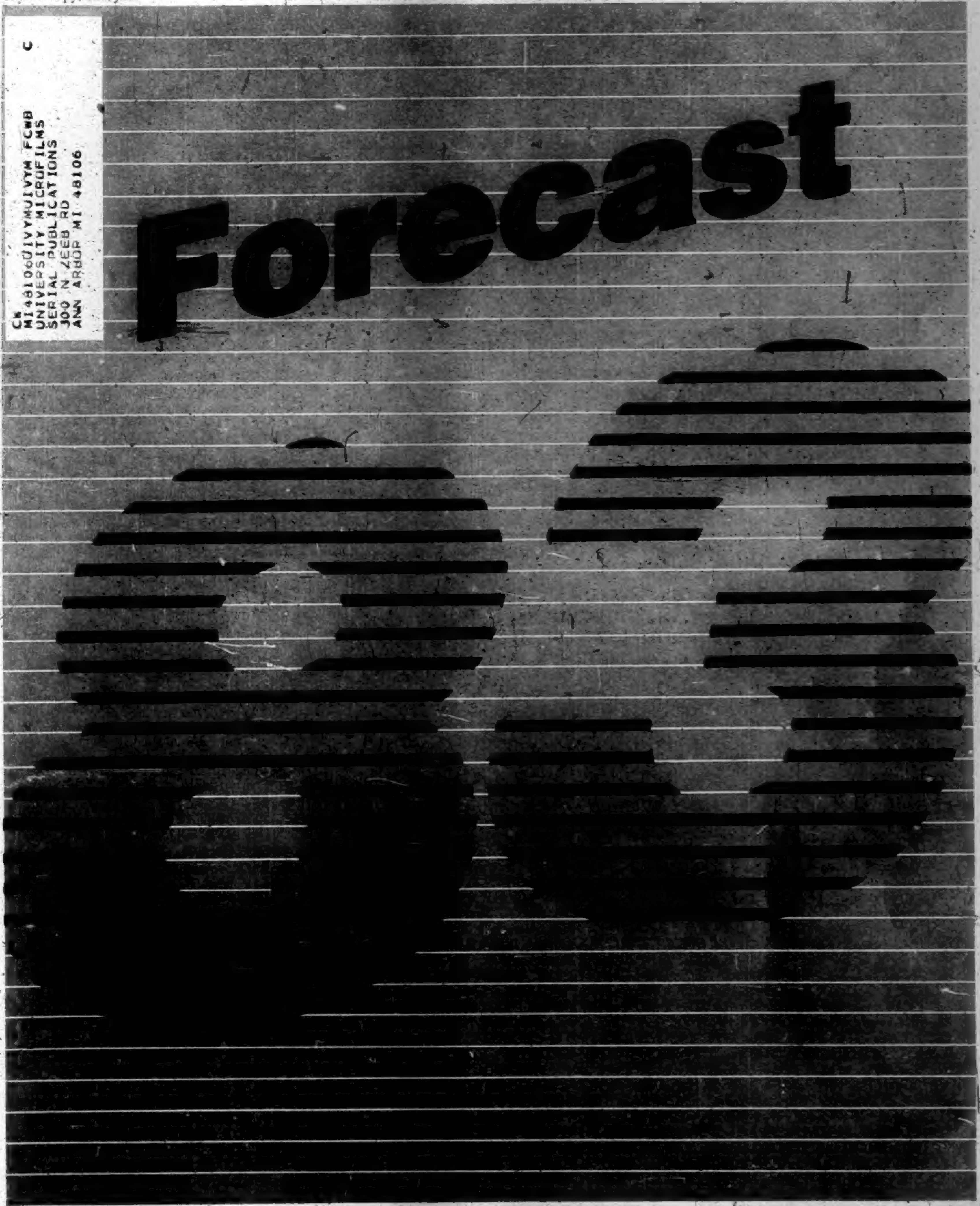

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Editor Jack B. Rochester
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Editor Ann Dooley
Copy Editor Nancy Fleming

Please address all correspondence to the appropriate department at Box 880, 375 Cochituate Road, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153.

OTHER EDITORIAL OFFICES:

New York City: Suite 7G, 401 East 80th St., New York, N.Y. 10021. Telephone: (212) 570-2135.

West Coast: 257 Lytton Ave., Palo Alto, Calif. 94301. Phone: (415) 328-8064.

Washington, D.C.: 880 National Press Building, 529 14th St. N.W., Washington, D.C. 20045. Phone: (202) 347-6718.

England: Bill Dunlop, Stephen Thomas, Berry Hobson Assoc., 345 Goswell Rd., Islington, London EC1V 7HN. Phone: 01/278 3415/6.

W. Germany: Eckhard Utpadel, CW Publikationen, Friedrichstrasse 31, 8000 Munich 40. Phone: (089) 34-60-61. Telex: 5215350.

France: Patrick Morel, Le Monde Informatique, 42, Avenue Montaigne, 75008 Paris. Phone: 720.85.66.

Asia: Mr. Shohei Kurata, Computerworld Japan, 4-19-7 [illegible], Tokyo 104. Phone: (03) 561-3862. Telex: 252-4217.

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133. Telex: [illegible] AA25468.

Brazil: Eric Hippeau, Data News, Computerworld do Brasil, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25, 10th Floor 20031 Rio de Janeiro, RJ Brazil. Phone: (021) 240-8225. Telex: 2130838 WORD BR.

Mexico: Richard Small, Computerworld de Mexico, Oaxaca 21-2, Colonia Roma, Mexico City 7 D.F. Phone: (905) 514-4218; (905) 514-6309.

Spain: Neil Kelley, Computerworld Espana, Barquillo 30, Madrid 4.

Denmark: Preben Engell, Computerworld Denmark, Gammel Strand 34, 1202 Copenhagen K. Phone: 01-1234-11. Telex: 27566 cwdan.

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Forecast

4
Next Year's Budgets

MAKING DO

Travel, education and other extras have disappeared from 1983 DP budgets. But increasing user demands have made many budgets appear recession-proof.

8
IBM One Year
After the Reorganization

LEAN, MEAN AND HUNGRY

Freed from a lengthy antitrust suit and trimmer after a timely reorganization, IBM is a $29 billion force on the move.

12
The AT&T Settlement

MAKING THE USER CONNECTION

Deregulation is leading to increasing competition in the telecommunications marketplace. Users will pay the price, but when do they get the benefits?

16
MIS Execs Explore
The Near Future

PREDICTIONS FROM THE HOME FRONT

MIS executives examine the issues that face DP departments in the near future.

21
Personal Computing
In Big Business

NO TURNING BACK

Like it or not, microcomputers are here to stay in large corporations.

25
The New End User

LESS FEAR, MORE SAVVY

DP information technocrats, beware! There is a revolution brewing among your end users.

29
1983 Software Budgets

A TEMPORARY HALT

Economic recession and cutbacks in new development projects add up to a flat year for software package budgets.

33
Business Graphics in '83

ART FOR ART'S SAKE?

The graphics market is expected to be a $4.6 billion industry within two years. But generating pretty pictures isn't enough to reach that goal.

36
Benchmarking
The Big Machines

HORSEPOWER OR HORSE FEATHERS?

Increasingly complex interactive and networking environments are making benchmark runs more of an art than a science.

39
Computer Economics in '83

LEASE, RENT OR BUY?

Cash position, technological obsolescence and flexibility are three factors to consider . . . and the final decision should be passed on to the finance department, according to the experts.

42
Local-Area Network Standards

THE LONG WAIT

Prospective users of local-area networks may finally get some standards, thanks to year-end action from IEEE 802.

48
Last Year's Layoffs

WHAT HAPPENS TO VENDOR REJECTS WHEN THE REJECTS ARE PEOPLE?

Economic hard times forced computer industry vendors to lay off thousands in 1982. *Computerworld* takes a close look at how the layoffs affected those people and what their prospects are for 1983.

54
The Worldwide
Computer Market

IS RECOVERY ON THE WAY?

President Reagan's predictions for economic recovery during 1982 were not borne out by computer industry performance. If analysts' prognostications hold true, 1983 may not be much better.

59
Free Trade vs. Protectionism

SELLING HIGH TECHNOLOGY

As advocates of U.S. protectionism gain influence, free traders predict a major trade war.

67
The Semiconductor Industry

1983 WILL GET BETTER. . .

Double-digit earnings have been the impossible dream for most semiconductor vendors in recent years. They are crossing corporate fingers that things will improve.

79
Technology
Under Development

A LOOK BEHIND CLOSED DOORS

Artificial intelligence systems, optical recording techniques, digital termination systems, cellular radio — a peek at the array of technologies that work in the labs but are still on the threshhold of commercial feasibility.

83
A Conversation
With Hank Koehn

A GLIMPSE AT THE FUTURE

A futurist whose speculations are rooted in real-world DP management ponders the fate of traditional information processing over the next decade.

Editorial 90
Software 93
Communications 97
Systems & Peripherals 99
Miniworld 103
Office Automation 105
Computer Industry 107
Advertising Index 142

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Next Year's Budgets

Making Do

By Susan Blakeney

Although many U.S. corporations are tightening their belts, most of next year's DP budgets have passed unscathed before watchful corporate eyes.

In fact, the majority of DP installations — 66% — were allowed to let out their 1983 budget belts an average of 17% compared with 1982, *Computerworld*, found when it surveyed 50 DP managers from companies of different sizes around the country. Ten percent experienced budget cuts, and 20% said their budgets were the same as last year.

The average DP budget accounts for 2% of a corporation's annual gross revenues, regardless of the company's size, according to the survey.

The survey did uncover some disturbing news: Three companies have had to defer DP projects because of the unfavorable economic climate, two have imposed hiring freezes and one company has filed for Chapter 11 bankruptcy protection. However, while 27 of the 50 DP executives surveyed admitted that the recession has brought belt-tightening in the areas of travel, education and other "extras," 30% said the recession has had no adverse effect at all on their spending habits.

Why are so many DP budgets seemingly recession-proof? Some DP directors suggested that the answer may lie in the fact that ever-increasing demands are being made on DP, coupled with the general belief that it pays to automate most procedures.

"In spite of a depressed economy, we're gearing up for the future of our company," observed John Shields, vice-president of management information systems (MIS) at Flexi-Van Corp., a $200 million lessor of transportation equipment. "The executives are very supportive of MIS, and we've been treated very well — so we can stay competitive for the future."

Next year, salaries will once again consume the lion's share of the DP budget — 46%, up 3.7% from 1982. However, the amount of money budgeted for salaries is up 12.9% from '82, whereas spending for '82 salaries was up 17% from the previous year. Nineteen of the 50 installations canvassed said they asked for the same percent of the corporate coffer to pay salaries as last year; nine expected less because of corporate cutbacks.

Eleven percent of 1983's DP budgets will go for managers working in DP departments. Programmers will account for 12% and systems analysts for 11% of the budget. Data entry workers, computer operators and other support and administrative personnel will claim 6%, 5% and 1%, respectively.

Among those DP executives surveyed, 56% said they will not be hiring additional staff in 1983, except to replace people who leave. Morris Fusco, director of data processing at Publix Shirt Corp. in New York, said his company has imposed a salary and hiring freeze until July 1.

The remaining 44% of the DPers polled said they will be hiring, mainly in the areas of programming and analysis, with a few jobs open for technicians, communications specialists and support personnel. Only one person will be hiring a manager.

Asked if they have any trouble finding qualified DP people, 82% replied in the affirmative. Only half the managers surveyed last year reported similar trouble.

The flip side of this coin, however, contains good news: 62% of the managers said the turnover rate has fallen in the past year. The remaining 38% said there

---

Staff Writer Susan Blakeney led the team of Computerworld writers who conducted the survey upon which the above story is based. The survey team included Jim Bartimo, Robert Batt, Jenny Charlesworth, Paul Gillin and Bruce Hoard.

has been no change. No one claimed that turnover is increasing.

Turnover or no, 27 of the managers surveyed do not or would not hire people without some kind of DP background. "I have enough problems," Fusco commented.

The other 23 DP directors do hire people without DP experience, but primarily for entry-level spots. People from in-house are the strongest candidates for these jobs ("We give in-house people aptitude tests and look at their job performance history," said one senior vice-president of DP), followed by people with liberal arts degrees and then by people with industry-specific or accounting expertise. Two managers in the survey said they also consider people looking to change fields; four others consider people who have taken some kind of DP course.

Positive Toward Non-DP Types

Asked whether the non-DP types are effective, all the survey participants responded positively. Several said they are extremely effective. "I think people have a tendency to reward you when you give them a chance at something new," one DP manager observed.

The average amount of money allocated for training next year is 1.7% of the DP budget, although 23 of the 50 DP managers polled will spend less than 1% on training. Last year's budget survey found that managers would be spending 2.6% in 1982.

Programmers average as much time on maintenance as on development work, according to *Computerworld's* survey. However, the gamut runs from 90% of time spent for systems maintenance to 90% for system development. This is close to last year's finding.

Software Expenditures

Application software will cost DP managers about 5.4% of the 1983 DP budget, the survey found. Fourteen of the DP managers surveyed said this figure is up from last year, with increases from 2% to 150%.

Eighteen DPers said the figure represents no change from the previous year, while four projected decreased application software costs for 1983.

Utility software has been allotted 5% of the 1983 DP budget. Eleven DP managers said this figure is up from last year; four said it is down; 16 reported no change.

Communications Costs

An average 5.6% of next year's DP budget will go for communications. In 42% of the installations surveyed, this includes expected expenditures for both voice and data communications. Eleven of the 50 DP managers' budgets cover only data communications.

Only one person said he will spend less on communications in 1983. About half will spend the same as this year and half will spend more (two managers are increasing their communications budgets by 100% each).

> *'. . . Unlike last year, when salaries were the issue of greatest concern for DP managers, this year's managers cited the increasing demands on the DP department and the integration of new technologies such as decision support, telecommunications, office automation and microcomputers.'*

While only 12 of 50 managers have funds in their budgets (an average 6%) for local-area networks, none of the managers surveyed last year budgeted for local-area nets. Half of this year's surveyed managers said they will be spending the same amount in 1983 as they did in 1982 for local-area networks; two will spend "slightly more." Four other managers could not separate local-area network expenditures from communications costs in general.

The purchase and license fees for minicomputers will eat up an average 6% of the managers' budgets, and the maintenance of these systems will cost an additional 2%. However, 60% of the DP managers will spend nothing on minicomputers.

Mainframes will cost managers a whopping 15% of their budgets; only one manager indicated he will spend less than before. But the range was wide: Some managers will spend as much as 62% of their budgets in this category, other managers as little as 1%.

Service and maintenance costs for

(Continued on Page 6)

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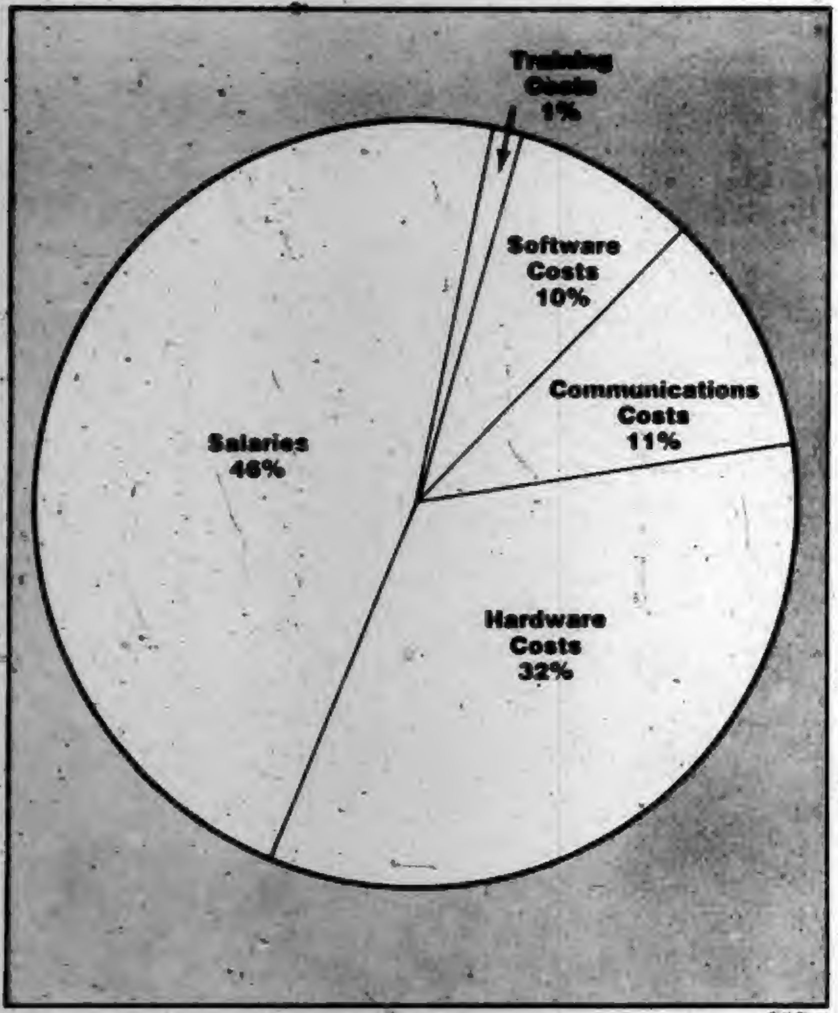

CW Chart

Estimated User Budgets in 1983

(Continued from Page 5)

those mainframes comprise another 2% of the DP budget. Managers will spend approximately 4% of their funds on peripherals.

All told, hardware costs will average 32% of the 1983 DP budget.

Of the 50 executives surveyed, 13 are responsible for selecting and buying personal computers in their organizations. Nineteen said the micros come out of end-user department budgets, six managers said the costs are charged to both the DP department and the end users' departments. The remaining 12 managers have no personal computers in their companies.

Of those that do buy personal computers, only three managers will spend 1% or more.

Whose idea was it to introduce personal computers into these organizations? In 45% of the cases, the DP department was responsible; 34% of the time it was end-users; and the remaining 21% of the time, it was a combination.

Seventy-eight percent of those surveyed are also responsible for purchasing office automation equipment. The other 22% said these expenditures are made by the individual user departments.

New equipment will be purchased by 35 (70%) of the DPers polled. The planned acquisitions mentioned most often include word processing/office automation equipment (14 responses), mainframes (12), peripherals (11), minicomputers (8), personal computers (4) and software (2). Mentioned once each: graphics systems and communications products.

Issues of Concern

When asked what single item in their budget has gone up the most since last year, the DP managers agreed that salaries top the inflation list, with software a close second. Also mentioned seven times each were peripherals and maintenance.

Communications came up three times, and one manager said the rising cost of energy is his pet peeve.

But unlike last year, when salaries were the issue of greatest concern for DP managers, this year's managers cited the increasing demands on the DP department and the integration of new technologies such as decision support, telecommunications, office automation and microcomputers.

The primary concern of Dick Hudson, corporate director of MIS at Global Marine, Inc. in Houston, is "the introduction of computers as an effective tool to the user community. We're hoping to have awesome amounts of processing in the end users' hands by the end of '83."

For Howard Jones, director of information services at Westmoreland Coal Co. in Philadelphia, the primary concern is "building a distributed processing network and interfacing office automation with data processing."

Other major concerns included salaries, the economy, turnover, productivity, motivation and escalating costs of equipment.

However, the DP chief for a major valve manufacturing company said, "We don't have any concerns. We only have opportunities." ■

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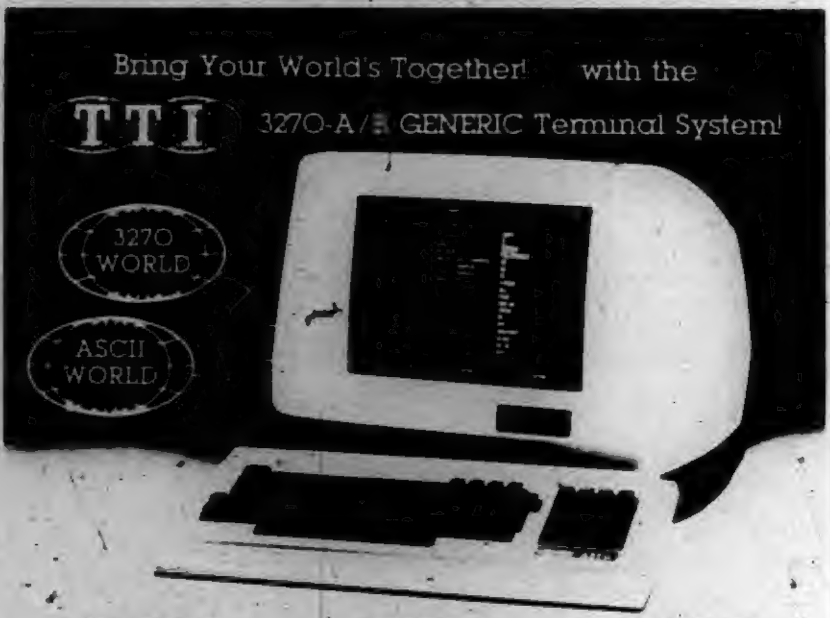
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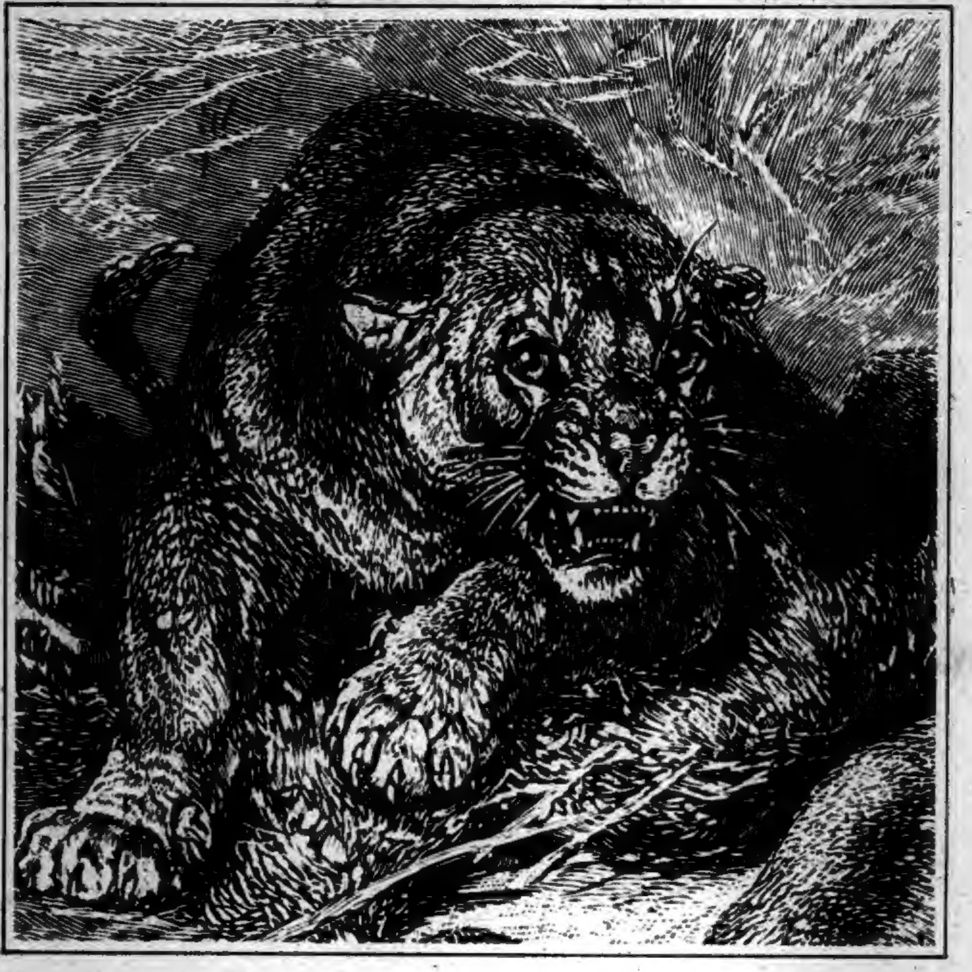

IBM One Year After the Reorganization

Lean, Mean And Hungry

By Paul Gillin

In 1982 the lion roared, and the jungle is not likely to be the same again.

With the chains of antitrust broken and its physique trimmed by a well-timed reorganization, IBM arose in 1982 to remind the computing world of just how much power a $29 billion company can wield in a crowded marketplace.

It has been 15 months since the Armonk, N.Y.-based computer giant revamped its marketing and service structure in a shakeup one analyst termed "massive, just outrageous," and nearly a year since the Justice Department dismissed its 13-year-old antitrust suit against IBM as being "without merit." In that time, most analysts, competitors and customers agree, IBM has become a formidable company indeed.

Its awkward three-pronged marketing force has been consolidated into a single structure. Large new accounts have been pursued with aggressive marketing campaigns featuring expanded product lines and aggressive pricing. At the same time, IBM has implemented a broad-based retail marketing plan for the Personal Computer which has been remarkably successful.

All of this has combined to ensure IBM's continued dominance in the mainframe market in which it already holds a 70% share, to demonstrate the company's leverage in the more competitive minicomputer arena and to establish an industry standard in personal computing — all in the space of only 18 months.

Key to this strategy was the October 1981 reorganization which folded all of the U.S. marketing and sales organizations into a single Information Systems Group split between large and small accounts. The move enabled IBM to regulate its product strategy closely while cutting down on the internal problems of the old arrangement, which often had salesmen scrambling over each other for the same accounts.

"IBM has evolved into a more aggressive, hard-hitting, leaner, meaner competitor," said Ulric Weil, analyst at Morgan Stanley & Co. "They're offering volume discounts, special bids, tough pricing and announcing new machines that are priced lower than their competitors."

Jack Hart, an analyst at International Data Corp. (IDC), reiterated Weil's view. "The divisions had become very autonomous," he explained. "In many cases, you had General Systems salesmen trying to figure out solutions to data processing problems. It was almost embarrassing for IBM. They would argue over what division would take the business, and Wang [Laboratories, Inc.] would finally come in and take it."

"A lot of us found it very frustrating,

Paul Gillin is a Computerworld *staff writer.*

especially when the product lines were competing head to head," said Thomas Kelly, assistant vice-president in the business economics department at Metropolitan Life Insurance Co. and president of Common, an IBM small systems users group. "One salesman would say the System/38 is our obvious solution while another would say a 4300 is the obvious solution. Not everyone in our group made the right decision."

IBM indicated that the ultimate beneficiary of the reorganization would be the customer, a promise the company seems to have borne out. [See accompanying story.]

The shakeup also sent a clear message to the competitive community that IBM saw little substance in the U.S. Justice Department's antitrust suit. Three months later, the Justice Department concurred. "That gave IBM clean sailing to become aggressive in entering new markets," Weil said.

A Flurry of Products

A flurry of product activity has characterized the 15 months since the reorganization. IBM has twice extended its high-end processor line, with the 3081 Model Group K announced in October 1981 and the 3084 unveiled last September. The company also introduced its MVS/XA and VM/XA operating systems with extended 31-bit addressing capability, and indicated these will be the flagship operating systems for the 1980s. Additional versions of the 3033 Model Group S processor have been introduced and the 4300 series extended with the addition of six new models and an updated operating system.

To the delight of customers and woe of the competition, IBM has also unleashed a campaign to recapture market share lost steadily during the 1970s. This year the market began to feel the impact of a strategy begun in 1978 when, "IBM made some decisions that were significant to the industry," according to Bill Easterbrook, a Kidder, Peabody & Co. analyst.

Those decisions included price reductions, capital expansion (IBM increased its production space fourfold between 1978 and 1980, according to one analyst), creation of the IBM Credit Corp., moves into microcomputers and the decrease of rental income as a proportion of revenue.

The strategy has been successful on nearly all fronts. New pricing policies which emerged this year have left competitors gasping and analysts shaking their heads in admiration.

"It used to be that you could predict IBM's bid on a contract within one or two percent," said IDC's Hart. "You can't do that any more. We've been seeing discounts of 30%, 35%, even 40% in the high-end market."

"Some of their product pricing has been company-killing," said P. David Pappert, president of Vion Corp., a seller of IBM-compatible equipment to the Federal government. Vion filed and subsequently withdrew a suit against the Federal Bureau of Investigation this summer over the FBI's awarding of a $17 million competing contract to IBM. Although Vion undercut the computer giant's bid by $1 million, Pappert said, he was stunned by the competitiveness of IBM's offer. "We were prepared for a lot more money between IBM and us than a paltry $1 million," he said."

Some see IBM's now-frequent price cuts and product enhancements as a deliberate strategy to undercut competition from supermini vendors such as Digital Equipment Corp., Hewlett-Packard Co., Data General Corp. and Prime Computer, Inc. For example, said Frank Gens, analyst at the Yankee Group, IBM can draw on its vast advantage in installed mainframes and their entrenched Systems Network Architecture (SNA) to offer new products which are fully SNA-compatible. "In order to provide users with communications functionality, the competing vendor has to be able to hook into SNA," Gens said. The lag time of 18 to 24 months required to develop that capability gives IBM time to cut prices or release a new version of SNA, he added.

Profits sacrificed through price cuts will be recovered both through the heavier volumes and by regular price increases on unbundled software. Weil predicts "Operating margins on hardware programs are likely to decline to the vicinity of 20% from the typical 30% achieved for hardware and software combined. However, substantial earnings from unbundled, separately priced systems software and other support services should compensate for the lower profitability." The company has

(Continued on Page 10)

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(Continued from Page 9)

also moved strongly this year to promote harmony with independant applications software vendors, a move which, Gens said, "will make it easy to use IBM systems in as many environments as possible."

This year, IBM has provided strong inducement for customers to buy rather than lease those systems, an indication that future announcements will come with increasing rapidity. "In round numbers, they've decreased purchase prices 30% and increased lease prices 30%," said Harry Edelson, analyst at First Boston Corp. "This is a sign that obsolescence is going to come more quickly. They can't have machines out there as long as they used to."

Virtually all leasing is destined to be handled by the IBM Credit Corp., created in March 1981, which buys equipment from the parent company and offers third-party financing. The arrangement allows IBM to increase cash flow and turn over new products without worrying about liability for old machines in the field. The change also looks good on the bottom line. In the nine months ending Sept. 30, IBM reported a 5% increase in rental revenue against a nearly 24% jump in sales income.

Wooing Customer Loyalty

The past year has also seen IBM take new steps to ensure customer loyalty by offering smoother migration paths at the high end of the product lines. Significant expansion has occurred in the field-upgradable 4341 and 3080 series, allowing a 4341 user to expand from .4- to 1.2 million instructions per second (Mips) or a 3080 user to move from a 3 Mips 3083 to a 27 Mips 3084 by simply upgrading CPUs. "In the past, the closest they've come to field upgradability was hooking two machines together," Hart said. IBM has also recently offered its 3087 Model 2 air-cooling unit on the 3080, making migration more attractive to users of the air-cooled 370s and 4300s.

But perhaps the most dramatic IBM success story of the year has been the Personal Computer. Announced in August 1981, the Personal Computer has almost singlehandedly legitimized the microcomputer market and set the scene for new IBM forays into office automation and distributed data processing.

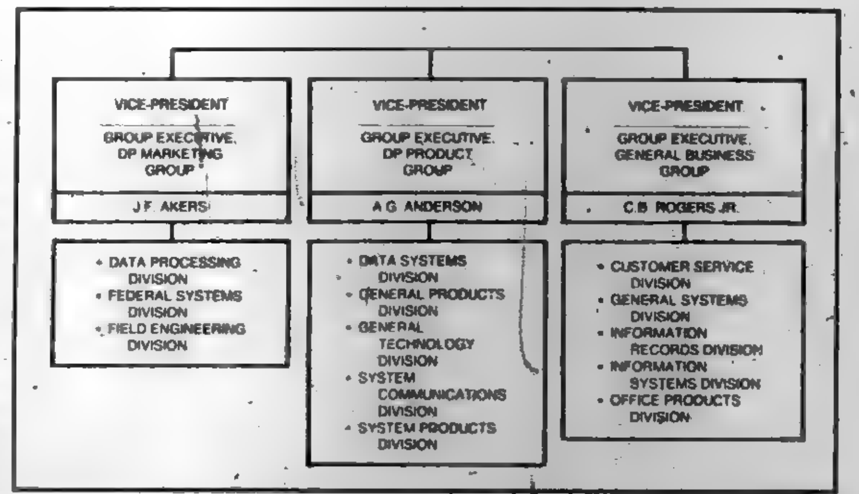
IDC expects IBM to ship over 180,000 Personal Computers in 1982, accounting for over $1 billion in revenues. First Boston expects more than 300,000 Personal Computers will be sold in 1983. Analyst Hart believes that fully one-half of all micro software activity is now oriented toward the Personal Computer. "The enormous success of the Personal Computer this year has blown everybody's mind," he said.

Other observers, though less impressed, say the Personal Computer represents an important new strategic direction for IBM. "From announcement day on, we weren't surprised at the Personal Computer's success," said Gideon Gartner, president of the Gartner Group, a Stamford, Conn.-based firm. "They showed an attitude toward distribution and the open architecture concept which marked it as an immense success."

With casual aplomb, IBM entered the Personal Computer into the uncharted retail market and settled in comfortably. "For a company of that size and complexity to establish channels of distribution with Sears Roebuck & Co. and Computerland and have it succeed that quickly is surprising," Hart said.

Other advances into end-user marketing include an expanding chain of IBM-operated retail stores and a commitment to establish permanent exhibits in computer market centers around the country. IBM's ability to sell directly to the end user

(Continued on Page 11)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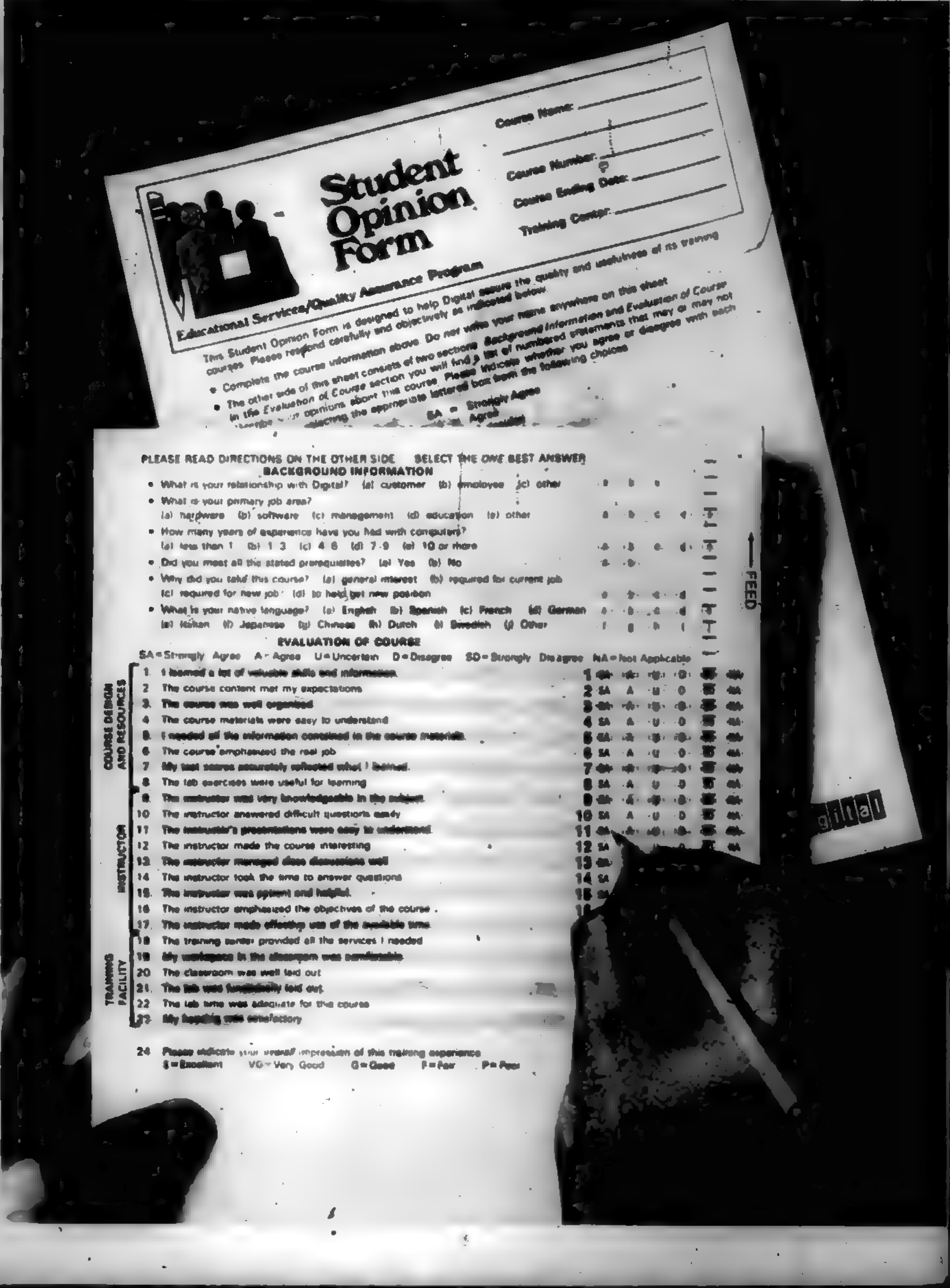
Source: IBM

IBM's Information Systems Business (March 1981) . . .



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Course Name:

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Course Ending Date:

Training Center:

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- Complete the course information above. Do not write your name anywhere on this sheet.
- The other side of this sheet consists of two sections: *Background Information* and *Evaluation of Course*. In the *Evaluation of Course* section you will find a list of numbered statements that may or may not describe your opinions about this course. Please indicate whether you agree or disagree with each statement by selecting the appropriate lettered box from the following choices:

SA = Strongly Agree

A = Agree

PLEASE READ DIRECTIONS ON THE OTHER SIDE   SELECT THE *ONE* BEST ANSWER

BACKGROUND INFORMATION

- What is your relationship with Digital? (a) customer (b) employee (c) other
- What is your primary job area? (a) hardware (b) software (c) management (d) education (e) other
- How many years of experience have you had with computers? (a) less than 1 (b) 1-3 (c) 4-6 (d) 7-9 (e) 10 or more
- Did you meet all the stated prerequisites? (a) Yes (b) No
- Why did you take this course? (a) general interest (b) required for current job (c) required for new job (d) to help get new position
- What is your native language? (a) English (b) Spanish (c) French (d) German (e) Italian (f) Japanese (g) Chinese (h) Dutch (i) Swedish (j) Other

EVALUATION OF COURSE

SA = Strongly Agree A = Agree U = Uncertain D = Disagree SD = Strongly Disagree NA = Not Applicable

COURSE DESIGN AND RESOURCES

1. I learned a lot of valuable skills and information.
2. The course content met my expectations
3. The course was well organized
4. The course materials were easy to understand
5. I needed all the information contained in the course materials.
6. The course emphasized the real job
7. My test scores accurately reflected what I learned.
8. The lab exercises were useful for learning

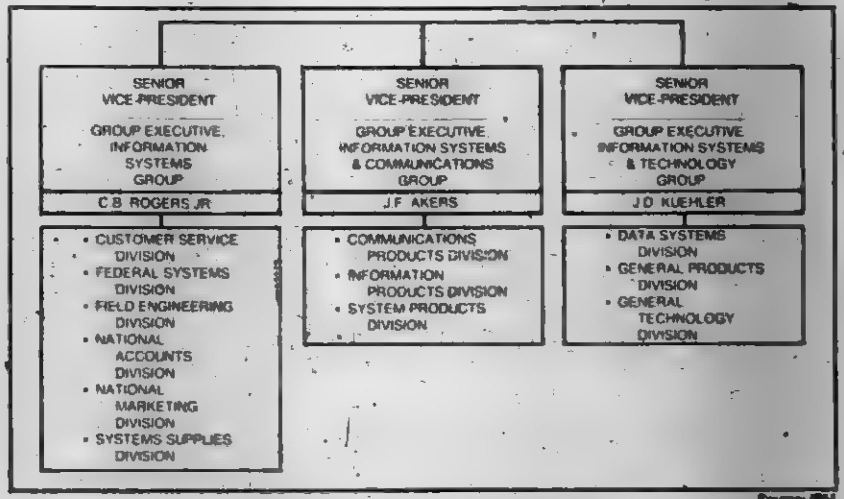
INSTRUCTOR

9. The instructor was very knowledgeable in the subject.
10. The instructor answered difficult questions easily
11. The instructor's presentations were easy to understand.
12. The instructor made the course interesting
13. The instructor managed class discussions well
14. The instructor took the time to answer questions
15. The instructor was patient and helpful.
16. The instructor emphasized the objectives of the course.
17. The instructor made effective use of the available time.

TRAINING FACILITY

18. The training center provided all the services I needed
19. My workspace in the classroom was comfortable.
20. The classroom was well laid out
21. The lab was functionally laid out.
22. The lab time was adequate for the course
23. My lodging was satisfactory

24. Please indicate your overall impression of this training experience
E = Excellent VG = Very Good G = Good F = Fair P = Poor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Source: IBM

. . . And After the Reorganization (September 1982)

(Continued from Page 10)

will become vital as mainframe revenues shrink from 81% of the total dollar market for computers in 1976 to 40% in 1986, according to IDC.

The leaner, meaner IBM promises to be a stronger market force in 1983 than at any time in the last decade. The company is boasting rising profits at a time when the country, and the industry, is bogged down in a recession. "People are taking it for granted that IBM is again a profitable company," said First Boston's Edelson."

The coming year is likely to see IBM continuing policies which have been successful in the past year: price competition, improved migration possibilities, increasing orientation toward the end user and ventures into new markets like communications, services, robotics and office automation. Now that the antitrust burden is gone, IBM is likely to continue to enter into cooperative arrangements like those announced this year with Mitel Corp. and Intel Corp. Diversification and price competition will also help insulate the company against the growing threat from the Japanese.

For second- and third-tier competition, the battle is only beginning. "Some competitors may not be able to stand the heat for long," said Weil. "But in a competitive environment, the customer is the winner." ■

Users See Improvement

Users have profited from IBM's new, more aggressive marketing strategy and consolidated sales force, according to an informal *Computerworld* survey of DP managers. Of 10 IBM shop managers interviewed around the country, eight said they had seen a marked improvement in IBM's responsiveness to their needs since the computer giant's reorganization in October 1981. The two dissenting voices were from users of small IBM systems.

"The service has gone from good to better," said Jim Sproules, director of computer operations at Georgetown University in Washington, D.C. "They seem to have gone out of their way to keep up to date and follow up on problems."

Sproules said he hears from an IBM sales representative weekly. The frequency of contact "has increased dramatically from a year ago."

Georgetown University uses IBM 370/148, 4341 and Series 1 systems.

Better Trained Staff

A large New England user, who asked to remain anonymous, said his planning staff was impressed by IBM's response to their recent upgrade needs. "A few years ago, the small and big systems people would have two recommendations for one problem," he said. "That has stopped and our people are very pleased with that."

A similar observation was voiced by a 370/158 and 3081 Model Group D user in Universal City, Calif. "A year ago I was trying to get all the IBM salesmen just to talk to each other," said Al Jerumanis, director of corporate DP for MCA, Inc. "Now they seem to have made a genuine effort to cross-train their sales people and to understand my needs."

But Jerumanis criticized IBM for not notifying him of an impending price reduction last year. "I was surprised and infuriated by a price reduction on our 3081 four months after we bought it," he said. "They had the right idea, but the timing was perceived as a negative action by our directors."

However, another 4331 user in New York complained that service and sales has deteriorated in his shop. "If you're a medium-size account like us you get very little service," he said. ■

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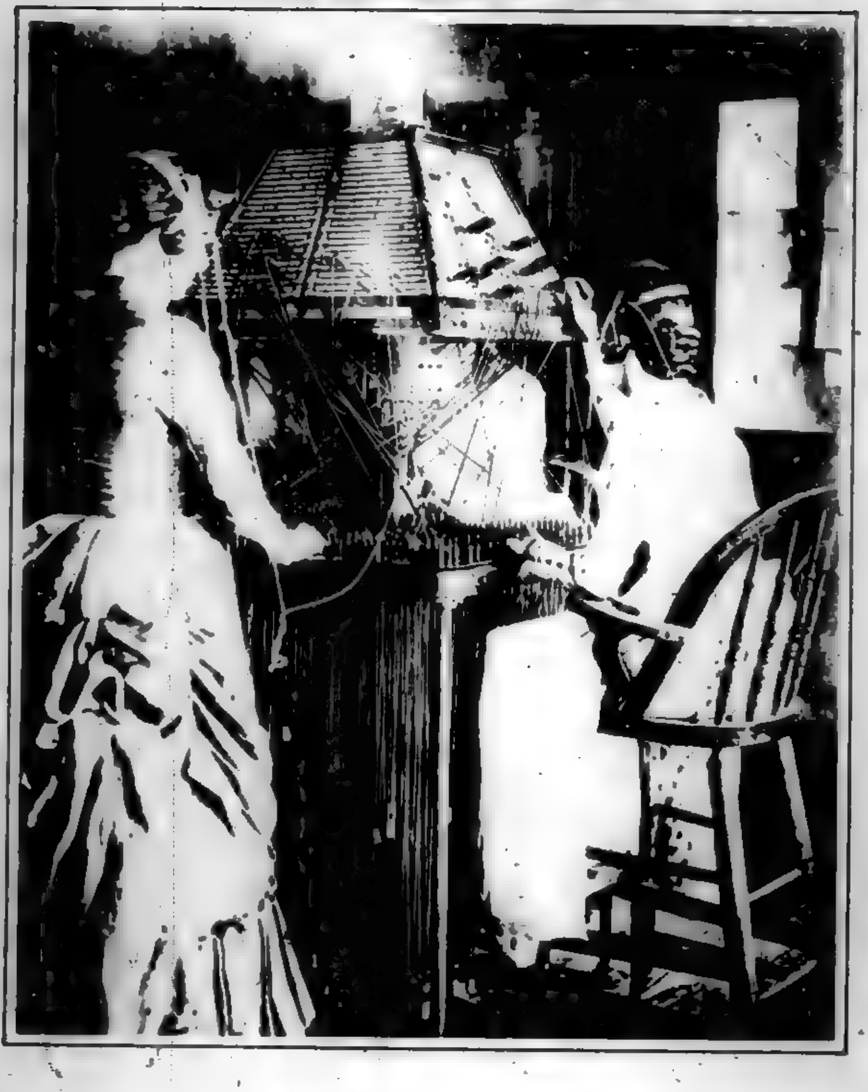

The AT&T Settlement

Making the User Connection

By Phil Hirsch

Although the government's antitrust suit against AT&T probably has been settled, the agreement has generated more questions than answers.

But amid the many uncertainties, there is at least one near-certainty: The acquisition and use of telecommunications facilities will become more complex for users.

As Bob Bennis, manager of communications systems at Westinghouse Corp., explained last November [CW, Nov. 1], "The major factors [responsible for increasing telecommunications costs] are inflation and regulatory decisions over the past several years. The divestiture agreement, however, is part of a trend which began with those earlier decisions — a trend toward replacement of regulation by modified competition. There's no question in my mind that the user is paying a price for this migration and that he'll continue to pay it for some time.

"It isn't an across-the-board payment, though. There are some areas where competition is already controlling, and even lowering, prices," Bennis pointed out. But, he cautioned, "It's going to take time for the benefits of the modified competition policy to become widespread. How long it takes and how widespread its effects will be depend on whether the principals follow the spirit as well as the letter of the divestiture agreement."

During the next several months, the spirit and letter of the settlement will be continually in the public spotlight as the Federal Communications Commission (FCC), Congress and the courts wrestle with the issues raised by what has been called the biggest, most complicated antitrust settlement of all time. One matter of particular interest to users is how the costs of telecommunications service will be reallocated now that the "separations/settlements" process is about to be junked.

Another key question is whether the settlement's main provision — the requirement that AT&T divest 22 of its operating companies — will make the telecommunications industry truly more competitive.

If the government's settlement with AT&T causes communications charges to rise, it will be rather ironic. The Department of Justice spent eight years (1974-82) and several million dollars prosecuting the phone company on the assumption that it would result in lower

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Phil Hirsch is senior editor/communications for Computerworld.

communications rates.

The government argued that Bell, by preventing specialized carriers from interconnecting their facilities with the telephone network and by requiring special interfaces for terminals made by other vendors ("foreign attachments"), was illegally limiting competition, particularly from new, more cost-effective suppliers of services and hardware. The payoff for AT&T, according to this argument, was perpetuation of a market in which the company could not only charge excessive prices, but could compound this sin by unnaturally prolonging the service lives of its products.

The terms of the settlement announced by AT&T's Chairman Charles Brown and Assistant Attorney General William Baxter last January were a good deal less painful for Bell than the terms originally demanded by the government. The January agreement required divestiture of only 22 Bell operating companies. A demand that Western Electric also be divested was dropped.

After the initial version of the settlement was unveiled, it went through an extended period of public comment and review. More than 600 individuals and organizations submitted 8,000 pages of comments.

After analyzing this material, Judge Harold H. Greene, who presided over the U.S. vs. AT&T case, demanded a number of changes on Aug 11. A short time later, the two parties agreed to the changes. The resulting document, generally referred to as the Modified Final Judgment, provides the blueprint for the reorganization of the Bell System which AT&T is now implementing.

However, 14 states, Tandy Corp. and the North American Telecomunications Association (a trade group representing independent manufacturers of private branch exchanges, telephones and similar terminals) have asked the U.S. Supreme Court to review the judgment. And Mark Fowler, chairman of the FCC, has asserted the commission's right to "review AT&T's divestiture proposals to protect the public interest," as he put it in testimony Dec. 1 to the House of Representatives' telecommunications subcommittee.

Judge Greene has "acknowledged" the commission's right to review the final divestiture arrangements, added Fowler, but the commissioner neglected to say who would have the last word in case the commission and the court disagree.

These are the major provisions of the Modified Final Judgment accepted by Judge Greene:

- AT&T must give up its 22 wholly owned operating companies. However, it holds on to the Long Lines Division, which will continue to provide regulated interstate communication services, and Western Electric and Bell Laboratories.
- The consent decree signed by AT&T and the Justice Department in 1956, at the end of an earlier antitrust suit, has been "modified." Its restrictions barring the phone company from offering unregulated services are removed.

However, the Modified Final Judgment adds one restriction: AT&T cannot offer any electronic information service for at least seven years after divestiture.

- The Bell operating companies must sell their embedded base of terminal equipment, plus their inventories, to AT&T, but they can market new equipment after divestiture. They can continue offering Yellow Page directory service and continue collecting the lucrative advertising revenue that goes with this activity. In addition, they can offer unregulated services by proving to Greene or his successor that such activity will not diminish competition.
- Between the divestiture date (probably Jan. 1, 1984) and 1986, the Bell operating companies must gradually provide exchange access to all intercity carriers equal to that provided by AT&T.
- Implementation of the agreement must be approved by the U.S. District Court.

Since last January, when the initial version of the agreement was unveiled, there has been much argument over whether U.S. Assistant Attorney General William Baxter should have held out for more. It was

(Continued on Page 14)

Key Events in the U.S. vs. AT&T Lawsuit

Nov. 20, 1974: The U.S. Justice Department, representing the federal government, files suit against AT&T. The case is assigned to Judge Joseph Waddy of the U.S. District Court in Washington, D.C.

Feb. 4, 1975: AT&T denies all charges.

Oct. 1, 1976: Waddy rules that the suit is proper and that he has jurisdiction. AT&T appeals.

Sept. 8, 1977: The Supreme Court agrees with Waddy that he has jurisdiction over U.S. vs. AT&T.

June 21, 1978: The case is assigned to Judge Harold H. Greene after Waddy becomes ill.

Jan. 5, 1981: After 2½ years of developing evidence, lawyers for AT&T and the Justice Department agree on the "concept" of a settlement.

Jan. 15, 1981: The trial begins, but Greene immediately recesses it until March 2 so the parties can prepare a formal consent decree describing the details of the settlement.

Jan. 20, 1981: President Ronald Reagan is inaugurated. Major personnel changes occur within the Justice Department, which then announces that it cannot meet the March 2 deadline.

March 4, 1981: The trial recess ends.

March 9, 1981: William F. Baxter, newly appointed chief of the Justice Department's Antitrust Division, vows to litigate the AT&T case "to the eyeballs."

July 1, 1981: The Justice Department completes the presentation of its case. AT&T requests dismissal of the charges.

July 29, 1981: Baxter asks Greene to delay the trial 11 months so Congress can address the issues. The judge refuses.

Sept. 11, 1981: Greene refuses to dismiss the charges. The Justice Department has demonstrated "that the Bell system has violated the antitrust laws in a number of ways over a lengthy period," he says.

Dec. 31, 1981: Baxter and AT&T announce they have resumed negotiations to reach a settlement of the case.

Jan. 8, 1982: Baxter and AT&T Board Chairman Charles Brown announce agreement on the terms of a settlement.

Jan. 11, 1982: U.S. District Court Judge Vincent Biunno, responsible for overseeing the implementation of the consent decree that AT&T and the Justice Department signed in 1956, approves the new settlement as a modification of the 1956 decree.

Jan. 15, 1982: Biunno transfers jurisdiction over the consent decree modification to Greene in Washington.

Jan. 21, 1982: Greene defers his decision on the Modified Final Judgment and establishes procedures for public comment.

Jan. 26, 1982: Rep. Tim Wirth (D-Colo.), chairman of the House of Representatives Telecommunications Subcommittee, says he is studying legislative action aimed at modifying the proposed settlement

Feb. 19, 1982: The 60-day period for public comment on the settlement begins.

May 5, 1982: Greene gives the Justice Department until May 20 to respond to public comments.

May 25, 1982: Greene orders a second public comment and response period, with a June 14 deadline.

Aug. 11, 1982: Greene issues an opinion on the proposed Modified Final Judgment, calling for a number of changes.

Aug. 19, 1982: AT&T and the Justice Department accept Greene's changes. ■

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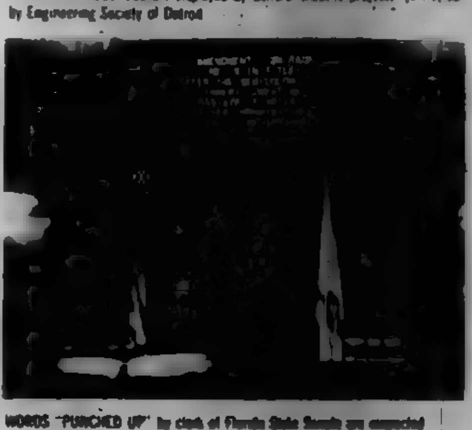

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(Continued from Page 13)

obvious, according to the government's critics, that AT&T was desperate to get into the on-line information services business, and it was equally obvious that it could not do that as long as the 1956 consent decree remained in effect.

The critics also contend that the government was about to win its antitrust suit against AT&T.

Another criticism of the settlement is that, by accepting a lesser degree of divestiture, the government has enlarged the FCC's role. Possibly the best argument for not doing that was given by the Justice Department itself when, in a pretrial brief submitted to Greene in December 1980, it said that "the FCC's inability to control AT&T's pricing [is due to the] inability to develop an adequate method of preventing [the company] from cross-subsidizing services that are subject to competition. There is no consensus on how to correctly allocate costs between 'competitive' and 'monopoly' services . . . While the FCC has an incentive to clarify these complexities, AT&T . . . has an incentive to hide its cross-subsidies by submitting inadequate and vague cost information."

The "futility" of FCC attempts to verify the phone company's cost figures, the statement added, is illustrated by the FCC's admission, 16 years after it began to investigate those rates, that their lawfulness "simply cannot be established."

The statement pointed out that the commission has been trying since 1971 to make AT&T provide "fair and equitable access to its essential facilities," yet today there is still a major argument over this question. One reason is that Bell and its competitors historically have been allowed to work out interconnection terms and conditions. The commission played the role of referee and final judge.

The FCC is now taking a more active role. However, it is unclear, given the agency's limited resources, whether this approach will be any more effective.

Half a Loaf?

After the U.S. vs. AT&T settlement was announced, Assistant Attorney General William Baxter has been criticized for accepting half a loaf or less in response to pressure from the White House. Another explanation for this is that between 1974 and 1982, on-line computer-based systems and services became a critical national resource — capable of increasing domestic productivity and erasing foreign trade deficits. Lopping Bell Labs and Western Electric off the AT&T organization chart would have been foolish, according to this reasoning, because it would have reduced drastically the nation's ability to exploit computer communications technology.

The Department of Defense also reportedly played a key role by insisting that the nation's defense is critically dependent on the long-distance telephone network. This might help explain why the government did not push its initial demand for separation of AT&T's Long Lines Division from Bell Labs and Western Electric.

Another possible reason is Baxter's reported view that the settlement — by breaking Bell's control over local-exchange facilities and requiring the Bell operating companies to interconnect on equal terms with all interexchange carriers — effectively eliminates the basis for AT&T's long-distance monopoly. The company's present dominant market share, he added, should wither away within a relatively few years.

Whether Baxter is right is possibly the biggest single question raised by the AT&T settlement. To some observers, the fact that Bell and the independent telephone companies currently carry the vast bulk of intercity communications traffic indicates that AT&T's monopoly will persist for some time. As Rep. Tim Wirth (D-Colo.), chairman of the House of Representatives Telecommunications Committee, argued Nov. 9 in a speech to state utilities regulators, "AT&T, with its noncompeting partners, still controls over 90% of the long-distance market and it will be many years — because of the cost of plant and other factors — before true competition will exist."

Battles Over Rates

One of the "other factors" is the access charge to be levied on interexchange carriers for the use of local-exchange distribution facilities. The Byzantine complexity of this issue is

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indicated by the fact that three separate access charge proceedings are under way.

One proceeding is concerned with "separations" — in other words, what costs of the nationwide telecommunications network should be allocated to interstate customers and what costs should be allocated to local-exchange users. The other two proceedings are concerned with "access charges" — how much interchange carriers and other long-distance users should reimburse the operating companies for the costs with which the latter are saddled as a result of the separations process.

At present, Long Lines Division pays a "settlements" fee to the Bell operating companies for the use of their facilities. This negotiation, like separations, is conducted within the industry, not at the FCC. (In fact, the two negotiations occur concurrently and are usually referred to as the "separations/settlements process.")

The other common carriers pay the local operating companies a tariffed Exchange Network Facilities for Inter-Exchange Access (Enfia) fee set by negotiation among the parties concerned and subject to final approval by the FCC. One of the pending proceedings is concerned with these charges; the other is aimed at setting a uniform access charge for all intercity users — Long Lines, other common carriers and private network users — that will impose a fair share of the burden on each.

At the moment, the Enfia controversy is generating the most heat. A few months ago, the FCC allowed AT&T, which negotiated the Enfia agreement on behalf of its operating companies, to raise charges $5/mo per connection beyond an interim rate set last spring. The phone company, along with a number of specialized carriers, has taken this ruling to court. AT&T insists the new rate is too low, while the specialized carriers argue that it is too high.

Since Enfia charges represent an estimated 25% of what it costs the other common carriers to service their customers, the outcome of this battle will have a signficant impact on the competitiveness of the intercity communications market. This is particularly true since it will be some time, if ever, before the FCC comes up with a single access charging scheme acceptable to both AT&T's Long Lines Division and the other common carriers.

Another knotty issue buried in the access charge proceeding (formally known as FCC Common Carrier Docket 78-72) is whether private net operators should pay more or less for use of local-exchange facilities.

Service Territories Under Fire

In addition to rates, Bell and its competitors are arguing about the Local Access and Transport Areas (Latas) that will replace the Bell operating companies' present service territories when divestiture occurs.

Today, the outer limits of each Bell operating company's territory generally follow state boundaries — within each territory are local exchanges serving population centers. The new scheme abolishes local-exchange areas, creating an opportunity, according to the critics, to subsidize what is now intrastate long-distance service with revenues derived from what is now local-exchange service.

Leading this chorus of critics, understandably, are the other common carriers. Much of their income is derived from servicing cities that will be within the same Latas.

One way for the other common carriers to evade the effects of high Enfia charges and overly large Latas is to bypass the Bell operating companies' local-exchange networks. Digital Termination Systems (DTS) represent the most popular option at the moment.

A DTS is a microwave-based local network connected to other DTS through terrestrial or satellite intercity transmission facilities. The local and intercity facilties, when combined, are known as Digital Electronic Message Services (Dems). They provide all-digital transmission, end-to-end, at speeds up to 1.5M bit/sec.

Nearly 40 suppliers have asked the FCC for permission to offer Dems, and nine applications have been approved. Even if no more systems are authorized, it appears likely that over the next five years or so DTS networks will be installed in most of the nation's larger cities.

The Unregulated Marketplace

Besides impacting the regulated communications market, the Modified Final Judgment erases the 1956 consent decree barring AT&T from offering unregulated services. The phone company is clearly eager to get into this business and has unveiled its first major product, the Advanced Information Service/Net 1000.

Next fall, in collaboration with Knight-Ridder Newspapers, Inc., AT&T will begin offering videotex service on a regular commercial basis, the first in the nation.

Meanwhile, the phone company is busily converting its present, largely analog network into one that can carry voice, data, facsimile, graphics and video from the sender's doorstep to the recipient in a single, integrated bit stream — a scheme that will support numerous additional computer communication services. ■

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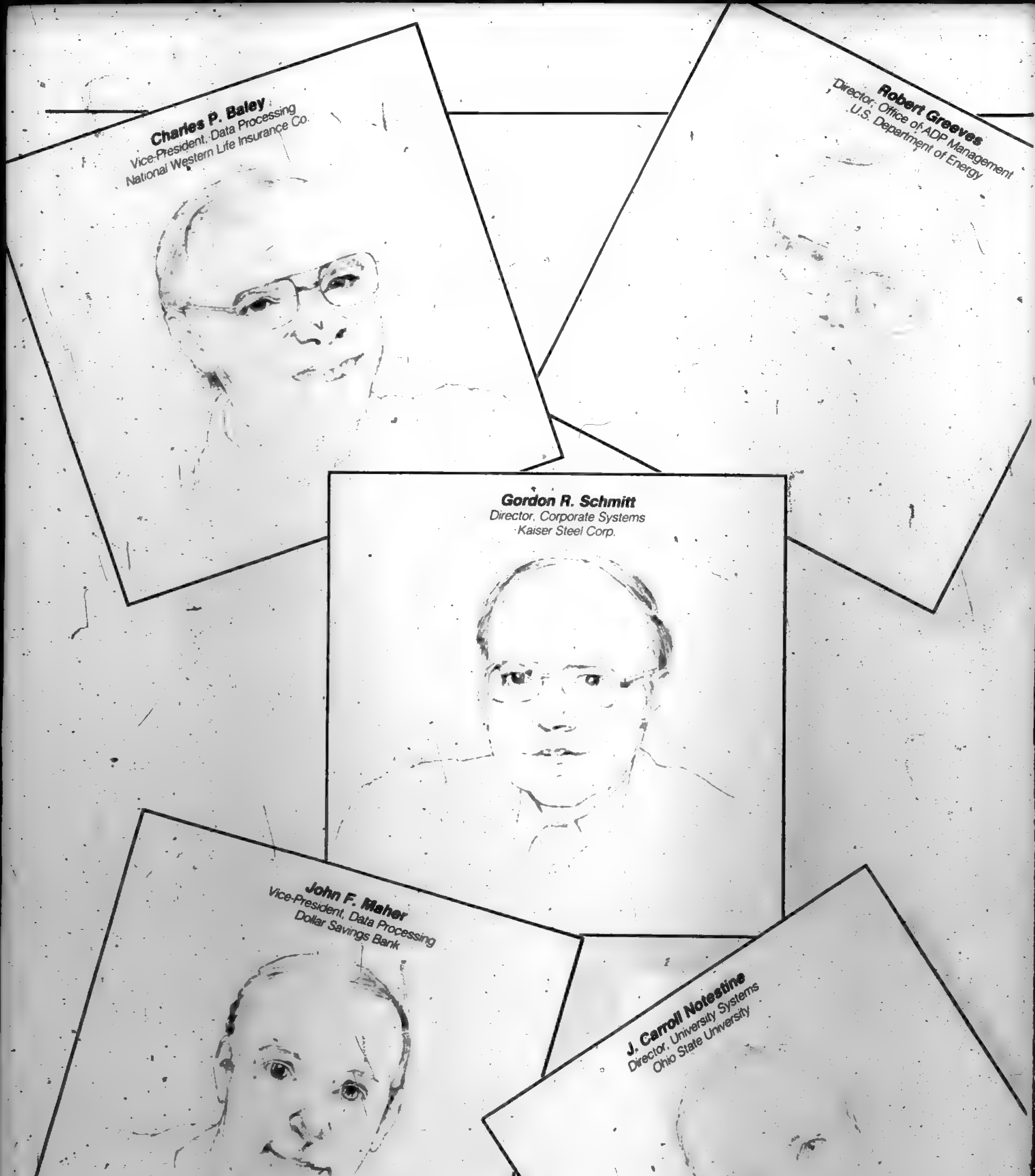

Charles P. Baley
Vice-President, Data Processing
National Western Life Insurance Co.

Robert Greeves
Director, Office of ADP Management
U.S. Department of Energy

Gordon R. Schmitt
Director, Corporate Systems
Kaiser Steel Corp.

John F. Maher
Vice-President, Data Processing
Dollar Savings Bank

J. Carroll Notestine
Director, University Systems
Ohio State University

ILLUSTRATIONS BY ANN BARTOLOTTI

MIS Execs Explore the Near Future

Predictions From the Home Front

By Bob Johnson

Computer gurus, media darlings, experts, analysts, scientists and manufacturers — these are the people most likely to be asked to predict the near future state of DP affairs. But the people best able to forecast the future of this business are probably those who, on a daily basis, see the trends emerging, make the policies and drive the product demand for this mammoth industry. These people are the DP and management information system (MIS) executives.

In an attempt to find out what the year ahead will bring, Computerworld *interviewed five top MIS executives in the industries that represent the largest groups of computer users among its readership — the financial, insurance and manufacturing arenas, government and education. The people interviewed represent DP shops both large and small in different areas of the country and are users of various vendors' products. The interviewees included the following:*

- *From the financial industry — traditionally a heavy user of computers and often a barometer for the economic stability of DP — John F. Maher, vice-president of DP for the Dollar Savings Bank in New York.*
- *From the insurance industry, Charles P. Baley, a vice-president of DP at the National Western Life Insurance Co. in Austin, Texas.*
- *From the manufacturing industry, Gordon R. Schmitt, director of corporate systems for Kaiser Steel Corp. in Fontana, Calif.*
- *From government, Robert Greeves, director of the Office of ADP Management for the U.S. Department of Energy, the largest federal computer user with 25% of all government computing equipment.*
- *From academia, J. Carroll Notestine, director of university systems at Ohio State University.*

In what ways will information processing in the near future influence the corporate hierarchy, particularly the company president and chief executive officer (CEO)? What will it mean to DP?

Greeves: A lot of people both in government and in industry are finally waking up to the fact that the control and management of information will dictate how an organization moves in the future. In all probability, this will be the dominant factor of control, and senior executives will have to be more interested in information resource management, which translates into more top-level exposure for the DP manager.

Baley: More DP exposure to corporate management will help bring the MIS [management information systems] executive into upper management itself. It's obvious that CEOs who are using information will either have to master the use of it themselves or hire a high-priced aide who knows how. The MIS executive is the CEO's likely choice for assistance.

Maher: As executives become more aware of what computers can do for them, they will increasingly seek more information in the form of timely reports and analysis data. The MIS guy, in turn, will become more than ever before involved in corporate decision making as a result of this.

Schmitt: I see a [vice-president] of systems on the horizon. For business to remain competitive 10 years from now, corporate officers will have to be more involved with this resource called data. When the corporate officers need to call upon the DP organizations to supply this resource, the [vice-presi-

(Continued on Page 18)

Bob Johnson is Computerworld's *New York correspondent.*

(Continued from Page 17)

dent] for information systems will become a reality.

Notestine: Because we are an academic organization, I can only say that we haven't seen any change in the administration's attitude in regard to DP in the last five years. However, the president of the university now sees the computer science curricula becoming more in demand now and in the future — he's now more aware of DP's importance overall.

What areas of hardware and/or software will, in your estimation, advance or change the most in the near future?

Greeves: The biggest change I see will come in the area of general-purpose computers. The larger ones will become more modular. This modularity will make it easier to buy systems which will probably offer technological enhancements and advancements within a medium-range time frame, such as support systems in microcode.

Unlike today, where most users replace IBM systems with more IBM systems, for example, the user of the future will go away from the basic vendor because of conversion costs. He will think more in terms of networking and subsystems and not worry so much about the vendor.

The faster local-area networking becomes available, with standards and broadband and baseband approaches, the faster users will become involved in modular computing.

Notestine: One buzzword that I hear is "fourth-generation languages." There will be a lot of products employing these languages which will emphasize simpler computer installation and software that is "usable" by customers. Most things will be designed to help the user.

Baley: On-line interactive hardware and software are the major things to look for. Also, the interaction between minicomputers and mainframes will present a minor boon to the industry. Right now it is difficult tying personal computers into mainframes without big costs and a lot of confusion.

Maher: I think the areas of hardware that will change will be in minis and microcomputers. With the costs continually coming down on this hardware, it's likely that it will be incorporated into the DP environment more.

Two other major occurrences will be in better available system storage capabilities, considering the voluminous amounts of data needed to be stored and the emergence of more software packages.

Schmitt: There will be a few major impacts. One area, especially in IBM shops, is the introduction of terminals with smaller footprints that are designed for the executive's desk. The standard IBM 3270 doesn't qualify. The terminal will have to evolve to a point where it becomes a small personal computer with local processing capabilities and perhaps a telephone connected.

A major direction in the near future for the user is [distributed data processing]. Users will demand — and get — processing close at hand.

Will the personal computer affect your DP operation in the near future? How?

Greeves: The [personal computer] will be a boon to the end user. Because the users will have these processing capabilities in their own areas, organizations will be forced into leaving more decision making to them. As a result, over the short haul, more pressure will be put on information management areas in trying to integrate the [personal computer] into the operation.

Schmitt: The [personal computer] will affect the industry, but from the standpoint of support, not in the development or installation of programs which will be for the most part packaged.

In the areas of education and communication, the [personal computer] will be most valuable in retrieving data.

Baley: I see the [personal computer] as a positive occurrence in this industry. A lot of system development work could be done at home by programmers using these computers. In the insurance business, they will affect the way field agency offices function. These offices will use the [personal computers] with our own software and software packages.

Notestine: The [personal computer] has certainly affected the area of education: It has radically changed the style of student instruction. Instead of the students having to use the university's main systems to do their research, they use [personal computers].

As far as faculty and staff are concerned, only 10% or 15% have been using [personal computers] in their normal procedure. How-

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ever, everybody has something that they want to do on a [personal computer]. It's probable that five years from now the [personal computer] will make word processors obsolete because of their ability to do [word processing] faster and at less expense.

Maher: The [personal computer] will make the public, in our case the customer, more educated about DP and how things operate. Things such as bill paying and stock analysis will be done using the [personal computers], stimulating customer interest. Our bank doesn't have any plans for [personal computers] yet, because the cost is prohibitive, but we are looking into the possibility of a home linkup, possibly with the TV.

What long-term effect will past and present economic hard times have on DP in general?

Baley: I don't think it has hurt it too badly. It has probably slowed down the salary increase range from about 10% to 12% down to about 8%, but that's about it as far as I can see. A positive effect is that it has tamed spiraling salaries common in the industry and has also stemmed job-hopping.

Maher: DP hasn't been affected as much as other businesses. In fact, with the price of hardware coming down, and the price of personnel going up, DP expenditures almost equal out.

Notestine: We have been affected very little. We never have money at the university to spend freely, so we never do experimental projects. Where we have felt a pinch is in how we use what we have. I'd say we've had a retrenchment on the average of about 5% in the last two or three years, so we do things like cutting the use of disk space a little closer.

Greeves: It hasn't had much effect on federal government DP. To a certain extent, the government is a little better insulated, so we haven't felt any major negative effects.

I think that in both government and private organizations, DP fares better than other industries.

Schmitt: The most obvious effect I have seen is the delay of projects due to budget decreases.

Do you see any problems acquiring high-caliber programmers and systems professionals, considering the highly touted shortages?

Maher: Yes, I do see a problem. The next two or three years are crucial. The problem exists because there is a lot of money spent on training, but worker productivity is not seen for a long time. A systems analyst from manufacturing cannot make an easy transition into banking — there is training and retraining involved.

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(Continued on Page 20)

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(Continued from Page 19)

jobs. What is needed is people trained in both DP and the industry they work in.

Schmitt: There is always this problem in DP. The industry has to do more training and get more business professionals with DP skills. Business professionals can be found anywhere, and if they are trained in DP it may satisfy some of the shortage problems. Conversely, DPers will have to be more oriented in understanding business, as opposed to hardware and software, so they can more easily move within the industry.

Notestine: I don't stay awake at night worrying about it, but I'm used to the problem because university salaries have never been top of the line and people are tough to get. Our best solution to staffing needs is the hiring of our computer science graduates. They are familiar with the systems and are experienced.

> *"The microcomputer will be the big deal of this decade. It will get people to use computers who never had exposure to them and will profoundly change expectations of how information can be processed."*

Greeves: Ours is the traditional problem of not being able to compete with private industry salaries. The hard fact is that you can make more money in the private world.

Baley: There are no problems in our case because we are in a favorable geographic location and close to the company which developed our operating software. However, I think the insurance industry will have problems because most of the software written for it is in assembler and there just [aren't] many good assembler programmers around.

What one trend will dramatically change the DP industry or DP within the corporate structure?

Schmitt: I see several trends. The largest single factor will be the integration of the [personal computer]. The [personal computer] is really a small portion of office automation — an area I see as exploding in the future. With word processing now being done by [personal computers], the field will grow like wildfire, and there will be even more justification to have them because of it.

Another thing is the recognition of data as a resource by the DP organization. The MIS area will realize that it will spend more time managing data. The user will have to have the tools to generate data and the DP area must supply them.

We will have to look at data as information which people need to know. If we see it as a resource, more kinds of tools will emerge, such as data dictionaries, in which to manage this resource.

Process automation — more automation and robotics in the work place — is also coming. In manufacturing we are finding that information which is a by-product of process automation is valuable for managerial analysis at a later time. This "bit bucket" data is being recognized as being worth more to people other than those just controlling the manufacturing process. The U.S. is behind in this area but it will catch up.

Greeves: My biggest concern is how the yet-unmeasured challenge by the Japanese is met in the next 10 or 15 years. This country will be hard pressed unless we keep up with research and the ability to work together.

Also, the advent of the [personal computer] and the revolutionary effect it is having on workers will impact the industry. This interest in the [personal computer] will carry over into the work place and force nearly everyone to use them.

Notestine: The microcomputer will be the big deal of this decade. It will get people to use computers who never had exposure to them and will profoundly change expectations of how information can be processed.

The telephone and computer integration will also go through a great evolution. The time is coming when you will see 50 million telephone/terminals all trying to access data banks.

Maher: A lot of little things will change DP. Off-premise programming or telecommuting will happen, for instance. It may just be a way to alleviate personnel shortages and provide a low-overhead way of developing systems.

Baley: End-user computing, which is already going on, will be a major factor in the industry. Also, less expensive hardware may open other avenues of progress. ■

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Forecast '83

Personal Computing in Big Business

No Turning Back

By Jeffry Beeler

Almost everywhere that personal computers are managing to gain a toehold these days management information systems (MIS) executives seem to be observing basically the same reaction: Once operations people overcome their initial reservations about owning and operating their own computing resources — once they take the microcomputer plunge — they seldom want or are able to return to DP business as usual.

What that enthusiastic user reception means for large corporations and their central computing departments is that personal computers are here to stay and that once they commit themselves to the machines firms can never turn back.

Although large mainframe-based data centers will almost certainly continue to exist indefinitely in one form or another, such facilities are steadily losing their distinction as the core of corporate decision making. In the future, traditional computing shops will be increasingly forced to coexist with more decentralized varieties of information processing built around personal microcomputers.

Thus, "DP managers and their departments can't afford to ignore micros and can't escape them," according to Dr. Richard Byrne, who teaches at the University of Southern California's Annenberg School of Communication.

For nontechnical end users, the arrival and widespread acceptance of personal computers on the corporate scene promises to produce a vast improvement in white-collar productivity. Dedicated micros also grant their owners a welcome measure of independence from large centralized computing departments, with their long response times, poorly designed systems and huge application backlogs.

But for DP managers and their organizations, the mass influx of business-oriented microcomputers has proved to be a decidedly mixed blessing and will almost certainly continue to do so in 1983. On the positive side, personal computers provide corporate computing departments with an "important opportunity to get out in the trenches, offer valuable services and get useful feedback," according to James Bandy, director of new-business development at Softec Microsystems, Inc.

"If computing professionals spent more time in operations where all the money that pays the DP salaries comes from, I think there would be a much better service done," Bandy said.

But although the advent of personal computers in the big-business arena has undoubtedly presented DP managers with some significant opportunities, the phenomenon has also confronted the

(Continued on Page 22)

Jeffry Beeler is a Computerworld *West Coast correspondent.*

(Continued from Page 21)

computing-shop heads with some new, unprecedented challenges. To encourage as much standardization as possible among a company's microcomputer products, DP managers need during the coming year to acquire new management skills without losing any of their existing technical know-how. They particularly must learn how to establish themselves among their firm's personal computer users as in-house technical consultants, according to PDC Systems, Inc. project manager Ronald Kagan.

During 1983 DP managers also need to create new, innovative channels of distribution that simplify the introduction, installation and support of personal computers in big corporations, One such alternative method of distribution calls for the creation of "in-company computer stores" that would allow firms to do for their own employees what retail store chains are already doing for the public at large. The stores would stock a variety of company-approved microcomputer hardware and software and then provide in-house users with the necessary support and training, according to Future Computing, Inc. head Portia Isaacson.

Whether DP managers prosper or languish next year in the face of the personal computer revolution depends to a great extent on how they play their cards. If they ignore today's microcomputer invasion and neglect to make the necessary adjustments, DP managers could soon find themselves "out of synch" with the rest of their organizations, PDC Systems' Kagan predicted.

"They will either be slow to respond to their users' changing technological needs, or they will introduce technology that their companies can't use," he said. "Either way, the results could be disastrous because the firms will be behind the times or will be misspending funds."

If, however, DP managers accept the widespread use of personal computers as an inalterable fact of life and position themselves accordingly, the payoff could be huge. Managed effectively, big business' growing acceptance of microcomputing could place the heads of large, centralized

> *'Whether DP managers prosper or languish next year in the face of the personal computer revolution depends to a great extent on how they play their cards. If they ignore today's microcomputer invasion [they] could soon find themselves "out of synch" with the rest of their organizations.'*

Firm Makes Efforts to Spur Micro Use

About a year ago, General Dynamics Corp. of St. Louis embarked on a two-pronged effort to spur increased personal computer use within its various divisions. In doing so, it joined the ranks of many companies presently engaged in bringing personal computing to end-user departments.

One part of the firm's program, whose impetus came from high levels of nontechnical management, was designed to give the company's employees strong incentives to buy their own Apple Computer, Inc. computer systems and use the machines strictly in their homes. As part of the arrangement, the firm negotiated a volume purchase agreement that has allowed novice users to acquire their personal computers at "substantial" discounts, according to Harold McBeth, director of General Dynamics' hardware/software plans and controls.

The other part of the company's effort to promote increased personal computer use involves the large-scale installation of Apple IIs and IIIs within the corporation's own offices. After General Dynamics buys the machines centrally, they are redistributed to the firm's general managers, who in turn decide which employees will receive the computers and how they will ultimately be used.

One of the program's main objectives is to educate General Dynamics' non-DP employees about what personal computers can and cannot do and how the machines can simplify their owners' work. In the end, the resulting increase in computing literacy and expertise is expected to boost the company's productivity significantly, especially among its engineers and financial people, McBeth said.

Since the microcomputer acquisition effort's inception, about 280 of the very small systems have found their way into General Dynamics' U. S. branch offices. And, in 1983, the company's rate of personal computer installations is likely to be at least as high and probably higher, McBeth predicted. ■

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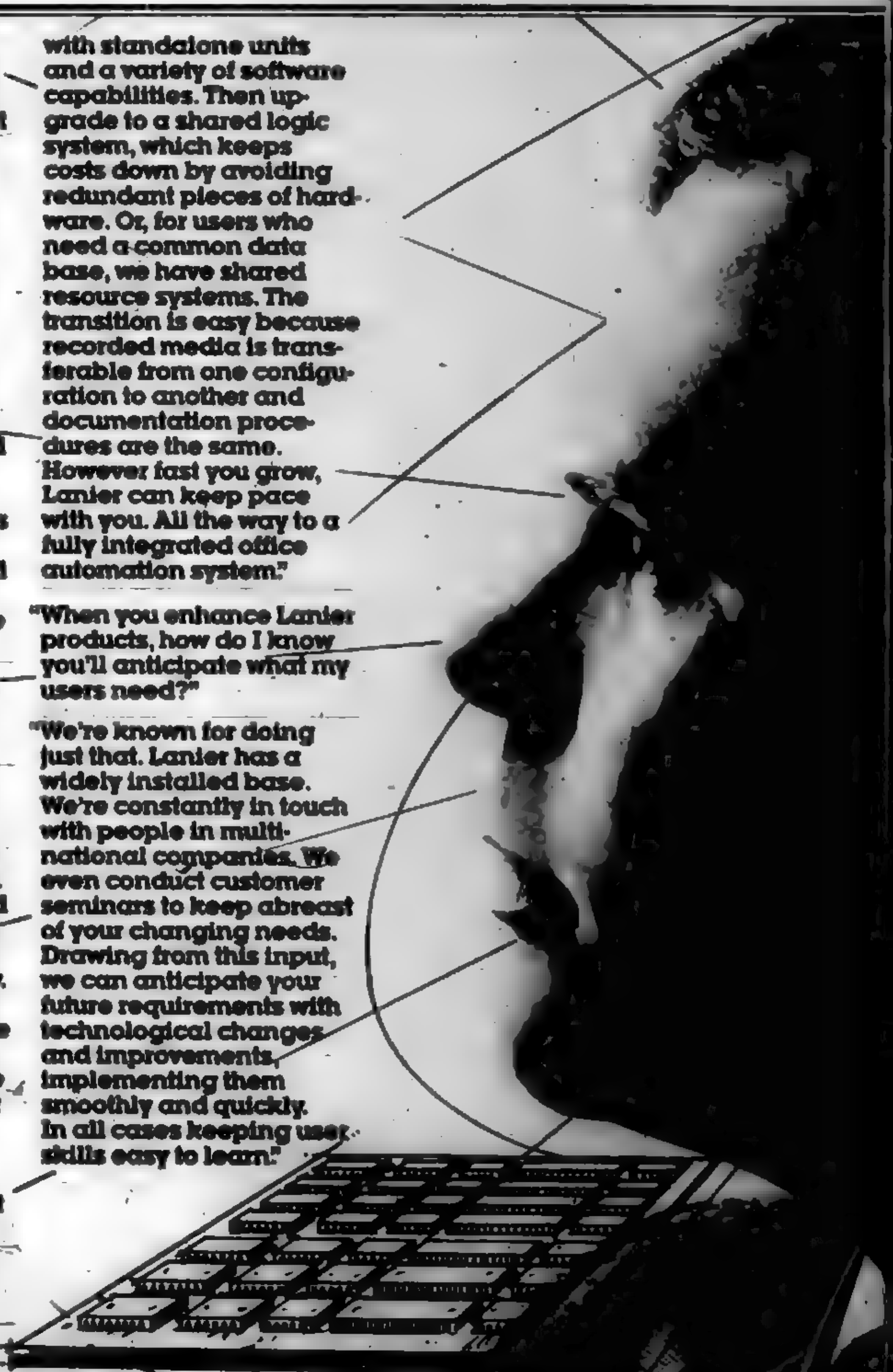

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data facilities in an ideal spot to shape and guide their companies' technological futures, Future Computing's Isaacson said.

The adoption of business-oriented personal computers could also thrust DP managers into a position of greatly expanded stature and authority within their organizations. "Micros provide DP managers with a way to make their kingdoms a lot bigger and better," Isaacson said. "With micros, these people can be real heroes, the ones who bring new technology into their organizations, dispense it, make it friendly and show their corporations how it can be used to speed information flow and ease management burdens."

Although personal computers have burst onto the DP stage only fairly recently, the machines are already fundamentally changing the way big corporations store, process and distribute their vital business data. Not too long ago, a typical Fortune 1,000 company controlled its computing-related activities almost completely from one central location.

But today, the old rules of the business information-processing game no longer entirely apply. Now, more than at any other time in DP history, computing power is increasingly migrating from the U.S.'s big, mainframe-based data centers and is finding its way at an accelerated pace into the remote corners of corporate operations.

This dispersal of information processing resources into the hands of nontechnical end users has confront-

(Continued on Page 24)

Selective Support Works Against Waste

One of the surest ways to minimize personal computer waste in large organizations is for corporate management information systems (MIS) executives to engage in selective support.

In theory, the idea works as follows: Data center officials first identify the microcomputer products they would prefer their users to acquire. The approved systems should be different enough in their features and capabilities to meet a broad range of user needs. Corporate computing personnel then buy the designated models in large enough volumes to qualify for quantity discounts and offer to make the products available to end users with full training and support.

At the same time, central DP also announces its refusal to support any personal computer offerings not on the approved purchase list.

The advantage of selective support is twofold, according to James Bandy of Softec Microsystems, Inc. It effectively limits a company's variety of microcomputer hardware and software by offering users strong inducements to acquire only approved models. And it still provides enough flexibility to allow users with a genuine need for nonstandard equipment to buy it, although they will have to arrange for their own training and support, Bandy noted.

Another technique that DP managers can use to minimize personal computer waste is to hold regular inhouse seminars that explain exactly what business-oriented micros can and cannot do.

"The organizers have to take great care not to use the seminars as a means of discouraging the participants from acquiring their own machines," Bandy warned.

On the other hand, he added, DP managers need to explain to the prospective users that adherence to corporate purchasing guidelines will enable them to preserve their investment in existing software even if they someday upgrade to new hardware.

Project manager Ronald Kagan of PDC Systems, Inc. offered a third way of enforcing companywide standards and thus avoiding personal computer incompatibilities. Kagan recommended that DP managers play a central role in forming inhouse "user communities." In essence, the communities serve basically the same purpose as users groups: They provide members with a ready-made vehicle for exchanging programs, technical advice and information about common professional concerns and interests, he pointed out.

For DP managers, the benefits of becoming deeply involved in user-community business are many. Participation in the communities allows data center directors to assess the needs of their personal computer users first hand. The involvement also places DP managers in an ideal position from which to dispense much-needed technical advice and information.

"If corporate MIS executives seize the initiative in forming user communities and can keep themselves at the center of the groups' activities, they will greatly increase the likelihood that their recommendations [to their clients] will be readily heard and accepted," Kagan said. ■

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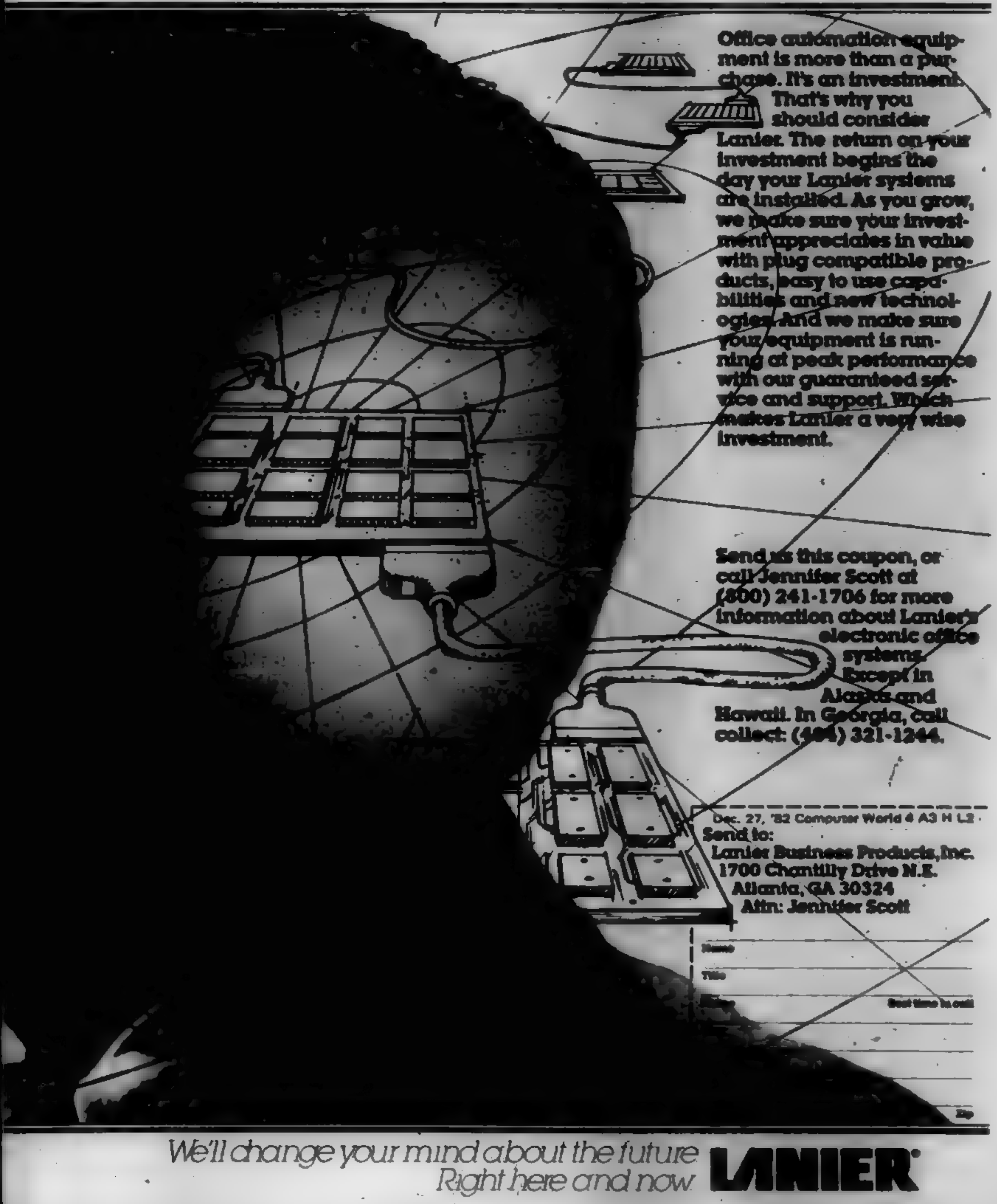

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(Continued from Page 23)

ed DP managers and their departments with a number of serious problems. One of those difficulties is that the influx of personal computers into field locations has proven virtually impossible for data center personnel to halt or even limit. Central controls on microcomputer acquisitions have been notoriously easy for determined end users to circumvent, according to Steve Kleiner, director of network design for E. I. Du Pont de Nemours & Co.

> *'In the nether regions of the big-business hierarchy — the realm where personal computers are increasingly making their presence felt — the influence of high-level MIS executives is strictly limited. The reason is that their global style of management thinking is usually ill-suited to the specialized needs of managers and their staffs at the operations level.'*

Another problem stemming from the diffusion of corporate computing power is that the staggering variety of commercially available microcomputer products has greatly hindered DP managers in their efforts impose and enforce companywide standards. Allowed to continue indefinitely, the absence of standards could eventually leave businesses with a confusing hodgepodge of competing hardware and software offerings, each unable to communicate with all the others.

To sidestep the problems of product incompatibilities and other microcomputer-related pitfalls, DP directors during the year to come will have to fundamentally rethink their management strategies and their role in the overall corporate scheme of things.

Until fairly recently, DP managers enjoyed almost exclusive control over their companies' computing resources. As the business world's information processing elite, they directed all in-house programming and system development activities and oversaw all major hardware and software purchases.

Today, DP managers still wield a high degree of decision-making power, at least in the large systems sector of the corporate computing world. But in the nether regions of the big-business hierarchy — the realm where personal computers are increasingly making their presence felt — the influence of high-level MIS executives is strictly limited. The reason is that their global style of management thinking is usually ill-suited to the specialized needs of managers and their staffs at the operations level, Softec Microsystems' Bandy explained.

Assume New Role

So to deal effectively with personal computer users and their concerns, DP managers have to drop their usual insistence on tight systems control and instead assume the role of technical helper and advisor, Kagan said.

> *'Instead of imposing their product preferences and other preconceived notions on the users they are supposed to be serving, DP managers should focus their personal computer energies on trying to avoid waste and eliminate system incompatibilities.'*

Although DP managers can recommend the purchase of one model of microcomputer hardware or software over another, they should resist the temptation to try to limit the flow of incoming systems to a preset volume. They should also avoid trying to tell their new-found "clients" what their problems are.

"People who work in the big corporate data centers are frequently so far removed from the operations side of the house that they don't have a very clear idea of what the nontechnical personnel truly need." Instead of imposing their product preferences and other preconceived notions on the users they are supposed to be serving, DP managers should focus their personal computer energies on trying to avoid waste and eliminate system incompatibilities, Bandy said. ■

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The New End User

Less Fear, More Savvy

By Catherine Marenghi

Revolutions have a way of happening without their key players being aware of it.

While the French revolution was bubbling like a pot about to boil over, Louis XVI recorded a single word in his diary every day: Rien ("nothing"). To his mind nothing was happening at all. Marie Antoinette acknowledged that something was amiss, but "Let them eat cake" was not the right approach.

In today's white-collar world, there is a cultural upheaval under way (and white-collar professionals do represent a culture). That change has been spurred by the introduction of small computers, personal data bases and even DP-inspired methodologies to the traditionally non-technical recipients of DP services known as end users. End-user computing has been hailed as a revolution. But, like Louis XVI and Marie Antoinette, the end users may be the last to know.

In the past, the end users have been forced to depend on the technology-rich DP technocrats for crumbs of information — usually delivered in indigestible form. The technocrats protected their glass-enclosed, raised-floor kingdoms by building formidable moats called application backlogs — successfully discouraging any contact from the technology-starved technopeasants.

Now end-user computing is creating a bridge between technopeasants and technocrats. And the push is coming from both sides. Out of this process will come a new breed of end user: fearless and sophisticated, largely self-sufficient, forming a fruitful partnership with DP.

This new breed of end user hasn't emerged yet. Nor will it ever emerge, if management information systems (MIS) types disregard the rapidly swelling numbers of personal computers as if to say, "Let them eat cake."

Who Are End Users?

End users have always been defined in terms of what they are not: computer professionals. That definition gets tricky, though, when you find general managers, accountants, clerks and even top executives writing programs in fourth-generation languages, fingering touch-sensitive screens and drawing up data models for their enterprises.

There is no such thing as a "typical"

(Continued on Page 26)

Catherine Marenghi is senior editor/features at Computerworld.

(Continued from Page 25)

end user. Amy Wohl, office automation guru and president of Advanced Office Concepts Corp. in Bala Cynwyd, Pa., sees end users reacting to automation on three levels.

The first level is characterized by enthusiasm and overwhelming acceptance of personal computing technology and automation. "Given the opportunity to use reasonably friendly technology, some percentage of office workers will respond very positively — in fact, they will get overly involved and waste time writing programs that already exist," Wohl explains.

In the second level, users will simply discover that the technology does what they want it to do and casually accept it. But, only "if it is easy to use, useful and introduced carefully," Wohl continued.

In contrast to the other two groups, however, the third group consists of "a substantial — but decreasing — number who want nothing to do with it [automation], either because it is bad technology or badly introduced or not useful for the amount of training required to learn it," the office automation expert said.

Socially Acceptable

Wohl sees more and more end users shifting from the third category into the first two. The reason? "We're getting smarter about how to introduce computing, and the machines are getting better. Also, there is a whole social milieu developing around personal computers. They are now an accepted part of an affluent, middle-class consumer culture," she explained.

No one doubts that end-user resistance to computing is still strong. However, the nature of that resistance is changing. Gordon Lippitt, behavioral science professor at George Washington University and president of the Bethesda, Md.-based Organization Renewal, Inc., sees more tolerance and recognition of the need for computing among end users and more acceptance of its inevitability. However, "we are seeing today a greater percentage of resistance *not* toward computers and word processors in and of themselves, but toward the consequences of computing."

Lippitt defined those consequences as "increased feelings of isolation from interpersonal relations, lessened social interaction and a feeling of being more remote from the point of decision making." The organizational behaviorist, who makes a business of "auditing people's feelings," sees continued end-user resistance to those consequences, rather than to the installation of machines themselves, and believes that organizations are only now beginning to learn how to cope with those consequences.

Not all applications are suitable for end-user computing. Large transaction-oriented functions like payroll and corporate accounting are obviously best left to DP. But for those applications that are appropriate for end users, such as decision support systems (DSS), financial modeling systems, forecasting, on-line queries and ad hoc analyses, the key element is the user/machine interface.

Just as many programming staffs have superstars whose productivity is double or triple that of their peers, many end-user staffs have "quick studies" who can master programming languages at the blink of an eye. These people are not the problem. The main challenge is to develop elegant, human-factored languages and tools tailored to those who are not inclined to learn much about them. Computing should be as easy for end users to master, as the telephone, and the human interface

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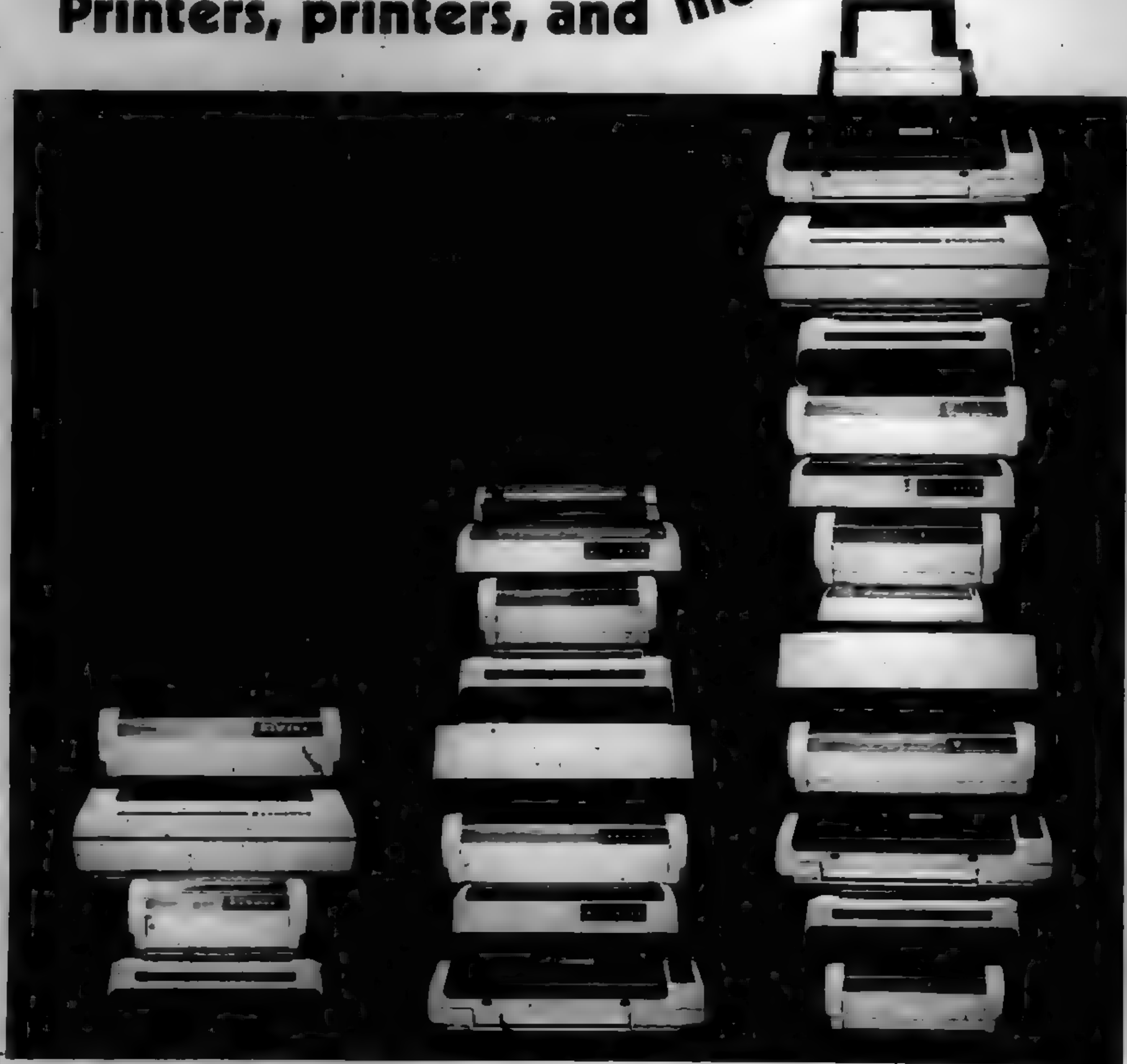


What Comprises Friendliness In a System?

While plenty of vendors claim their products are user-friendly, that promise is only beginning to be made good. Amy Wohl, president of Advanced Office Concepts Corp., pointed out that some systems are friendlier than others, but none are consistently friendly. Her criteria for friendly office systems:

- Menus and prompts — it would be especially helpful to be able to customize these, Wohl noted.
- "Soft" or programmable keys.
- Built-in training aids.
- On-line Help facility.
- Partitioned screens, so that the user gets only the required functions.

Wohl cited Xerox Corp.'s Star system for ease of use and its attempts to provide tutorials, but warned that "it takes too long to do things, and the overhead is costly." She went on to cite Hewlett-Packard Co.'s Office System for its soft keys and Exxon's Office System 5000 for its menus.

Grid System Corp. offers a system with an easy-to-learn interface and a single set of consistent alphanumeric commands, but that still requires end-user training, she added. ■

should be as friendly.

Larry DeBoever, director of data base products for Computer Corp. of America, Cambridge, Mass., has described user-friendly tools as a "myth" [CW, Aug. 23]. "The tools that are universally described as easy to use are not. Most likely they are easy to learn, which means that end users must still learn a syntax," DeBoever wrote.

What is required of a truly user-friendly interface? DeBoever offers the following criteria:

- Browsing capability. Today's line managers are already inundated with information, and they need the capability to slosh around for the data they need.
- No need to learn a syntax. Because browsing is visually oriented, the user needs to be able to scan, say, a financial graph and zoom into increasing levels of detail — without having to type commands.
- Access to real production data, and not merely extracts of that data provided by programmers. End users need timely and complete data for ad hoc analyses. The solution, DeBoever argues, is integrated corporate data bases.
- No need for typing. Voice recognition systems and menu-based systems with programmable function keys or "soft keys" are a step in the right direction, but there are trade-offs: these interfaces typically preclude ad hoc inquiry and browsing, DeBoever noted.

Weighing Trade-Offs

Clearly, there are trade-offs involved in all the so-called user-friendly tools and systems, and the decade ahead will see a continual refinement in their ease of use. The tools that succeed will be those that best fit the end user's way of working, with minimal trade-offs and adjustments, according to Philip Rothenstein, vice-president of public finance for New York-based First Boston Corp.

Rothenstein has had several years' experience in computer services and internal time-sharing at his firm and has observed unilateral end-user resistance to the introduction of nonprocedural or "fourth-generation" tools. At First Boston these tools have included Focus from Information Builders, Inc., Cuffs from Cuffs Planning and Models Ltd. and Tell-a-Graf from Integrated Software Systems Corp.

"There is still too much handholding required with these [fourth-generation] tools," Rothenstein said. He compared them with Visicorp's Visicalc, the spreadsheet tool which he said "a guy can relate to" because it mirrors something a user would do with pencil and paper. He cited word processing as another successful application area because word processors imitate and improve upon what the writer or editor normally wants to do: "cut and paste" electronically.

The human interface will stand out as the key issue in system design and selection in the years ahead, often edging out price/performance considerations, and end users will have a prominent place in that decision-making process. As F.G. "Buck" Rodgers, IBM vice-president of marketing, puts it, the end user will be the "prime acquirer" of information systems by the end of the decade [CW, Nov. 29]. "The more the value of information is realized within a company, the more end users will have a say in which systems are appropriate," he added.

In many organizations, end users have struck out on their own and have purchased their own personal computing facilities. In others, the need for end-user involvement is first recognized by MIS management, which initiates the introduction of small computers, nonprocedural tools and Information Centers to ease the application backlog and improve productivity. Ideally, end users and DPers will be moving toward a partnership, shaped by the political factors and the culture of the individual organizations.

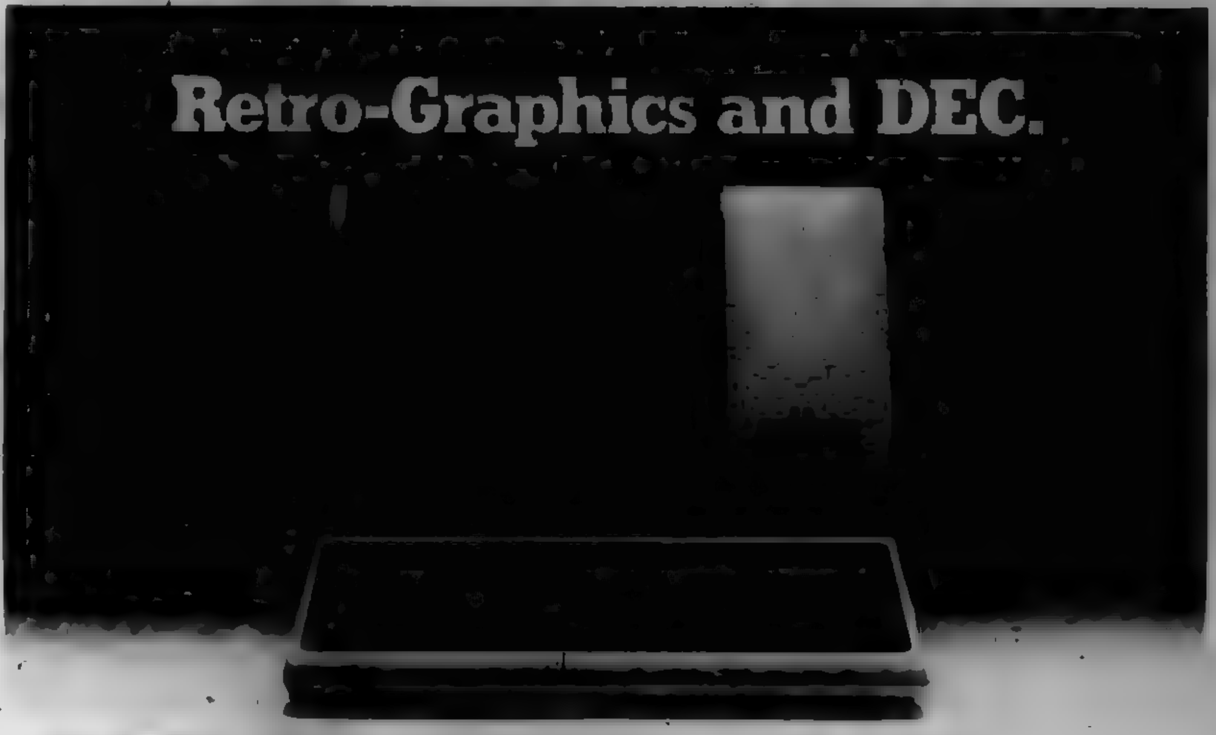
James Martin, in his book *Application Development Without Programmers*, urges the move toward end-user computing and application development where appropriate [Prentice-Hall, 1982]. He describes the major hurdle as a cultural barrier: "[End users] are mostly frightened of terminals and regard the creation of computer applications as a mystique entirely beyond their reach. Nevertheless, the best case studies of end users doing their own application creation are very impressive . . .

"Overcoming this cultural barrier is something that each organization has to confront on its own rather than waiting for any overall change in the computer industry," Martin added.

The first stumbling block in overcoming this hurdle is the tarnished reputation of most MIS departments. One approach is the Information Center, as espoused by IBM Canada, which creates a DP/end user liaison.

Clive Finkelstein, who developed the information engineering methodologies, stresses the need for creating an end-user/DP partnership and circumventing the political problems that surround MIS.

Waiting on the other side of the cultural barrier is a new — and informed end user who will inspire new creativity in the application development process. ■



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Forecast '83

1983 Software Budgets

A Temporary Halt

By Lois Paul

After gazing into their crystal balls for clues about the 1983 economic environment, DP managers are opting for packaged software budgets that either mirror or only slightly increase their 1982 expenditures.

This was the word from 12 of the 20 DP managers across the country contacted in an informal *Computerworld* telephone survey.

"If I get one software package for next year, I will be lucky," observed Arthur J. Errickson, division manager of DP systems for Frederick Atkins, Inc. in New York. "I am going to make it with what I have for next year." Errickson gave his purchased software budget a minimal increase for 1983.

At the First Boston Corp., New York investment brokers, "we're pretty much leveling off, which I thought would never come," said Joseph Licata, vice-president of data processing. He anticipated an increase of about 20% in expenditures for packaged software next year, an increase smaller than in previous years, when the firm acquired large packages such as data base management systems or telecommunications software.

While the economy has been a factor in shaving increases in software expenditures, few of the DP managers contacted laid the blame there directly. Only John C. Murray, corporate director of the data center for Damon Corp. in Needham Heights, Mass., admitted that his firm has an ongoing austerity program for fiscal 1983.

There is hope that the economy will improve next year, "but in anticipation we are cutting our budget." Accordingly, Murray's budget for systems and applications software will rise 10% to 15%, an in-

(Continued on Page 32)

Lois Paul is Computerworld *senior editor/software.*

Experts See Big Push for Packaged Software

According to the experts, DP managers will be turning in droves to packaged software in 1983 for canned solutions to problems that would be too expensive to develop in-house in a difficult economy.

However, the majority of the DP managers contacted by *Computerworld* recently in an informal survey indicated that their expenditures for software packages will be flat or only slightly increased next year.

Stressing that packaged software is the ideal solution for the harried DP manager who is asked to tighten his belt but meet ever-increasing demands from end users, the consultants and industry analysts admitted that most software package purchases next year will be in the minicomputer and microcomputer classes.

This may be the reason for the divergent viewpoints. When talking about expenditures for packaged software, the DP managers surveyed by CW spoke almost exclusively about mainframe software — the "big-ticket items" that would absorb the largest piece of their budget.

"I see next year being an absolutely banner year for packaged software," Herb Gepner, software analyst for Data Decisions in Cherry Hill, N.J., said. "I don't see the economy changing very much — not too quickly — in spite of everything the government is predicting. If we do come out of the recession, it will be sometime late next year. During that period of time, the activity is going to be in the purchase of software."

Gepner conceded that the economy could slow down these purchases, particularly when they involve mainframe packages. "It may have an adverse effect on data base management systems and large sophisticated packages or systems along that line," he added.

It is the mini and micro arenas in which Gepner sees purchase growth. When it comes to mainframe packages, applications software should fare well, however, because "there are always changes in the governmental requirements. There are always people who are still working with antiquated accounts payable and general ledger systems," Gepner said.

International Data Corp. (IDC) of Framingham, Mass., is projecting an increase of 32% in the value-added software marketplace in 1983.

"That is pretty good growth in an economy where there is probably going to be a shakeout in the desktop market, where there already is a shakeout in the minicomputer market and where every major hardware vendor around (with the exception of Wang), as far as I can tell, is laying people off or at least freezing hiring," Carol Weiszmann, IDC director of research, noted.

"Everything is just in a holding pattern, and I think it is going to stay there for at least the first half of '83," she added.

Warren Culpepper, president of Culpepper & Associates, a Georgia-based consulting firm, expressed optimism that expenditures for packages are going to increase. "Mainframe buyers will be looking to software companies more than ever for solutions to their problems," Culpepper said.

In systems software, he said, this represents no more than a continuation of the general trend: "No one is developing his own systems software, of course." However, in the applications area, it represents a shift from in-house development to purchase of products from outside sources, particularly during 1983.

"Budgets are squeezed more than ever, people are very tight on the personnel they can have in-house and needing better solutions. So there seems to be but one reasonable alternative — that is more outside applications software," Culpepper observed.

Max Lebow, software editor of Datapro Research Corp. in Delran, N.J., predicted that "the economy as a whole will probably dictate moderation in software purchases."

Lebow suggested that the price of applications software packages will come down because of advances in systems software. "It just isn't going to cost as much to move software from one machine to another," he explained.

Many DP managers may turn to applications generators to develop their own in-house applications programs rather than resorting to the package alternative, Lebow believes.

Lebow also thinks that end users may play more of a part in the purchase of packaged software than they have in the past. If end-user departments are claiming part of their budgets, this could explain to some extent why DP managers have less to spend. ■

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Four Companies Budget More for Packaged Software

Major increases in expenditures for packaged software are planned in 1983 for four of the 20 firms surveyed recently by *Computerworld*. In all four cases, the firms are working from a very small base of packaged applications software and are in the process of beefing up their libraries of canned products.

Helene Curtis Industries in Chicago, for example, is looking at an increase of about 50% in packaged software spending in 1983. "Most of the increase is in applications software," said Ed Valliere, director of data processing.

"There could be some systems software increase in that we might be going to VM. That will incur some extra cost for us," the DP director added.

Valliere purchased a general ledger package last year and now is looking for a human resources management product. The general ledger package represented the firm's first purchase of applications software, bringing quite an increase in the packaged software budget from 1981 to 1982.

'ITT is working from a "fairly low base" in terms of applications software. This and the quality of the packages available prompted [the company's director of corporate information systems] to project between a 90% and 140% increase in expenditures for applications software in 1983.'

The economy has not affected Helene Curtis, according to Valliere. "The shampoo business is good," he said. "It probably is one of our record sales years in profits."

New England Business Services in Groton, Mass., is anticipating a 100% increase in its packaged software budget, mainly because the firm has purchased very little outside software in the past.

"Also, some of these packages are of the larger scale," Kenneth R. Canaway, director of corporate data processing, said, noting that over the next couple of years the firm expects to spend about $200,000 on packaged software.

J. Henry Schroder Bank and Trust in New York also expects to increase its expenditures for packaged software about 100%. The reason: "We are bringing in all new applications," explained Alfred A. Milici Jr., vice-president of information services.

This trend began in 1982 for the bank, which will make the bulk of its acquisitions in 1983. The acquisitions will include both applications and systems software.

"We will at least double our expenditures in 1983 over 1982 for applications software," said Colin F. Bate, director of corporate information systems for ITT in New York. "There is no question about that because of the different acquisition mode we are now in with regard to software."

Bate said ITT is working from a "fairly low base" in terms of applications software. This and the quality of the packages available prompted him to project between a 90% and 140% increase in expenditures for applications software in 1983. ■

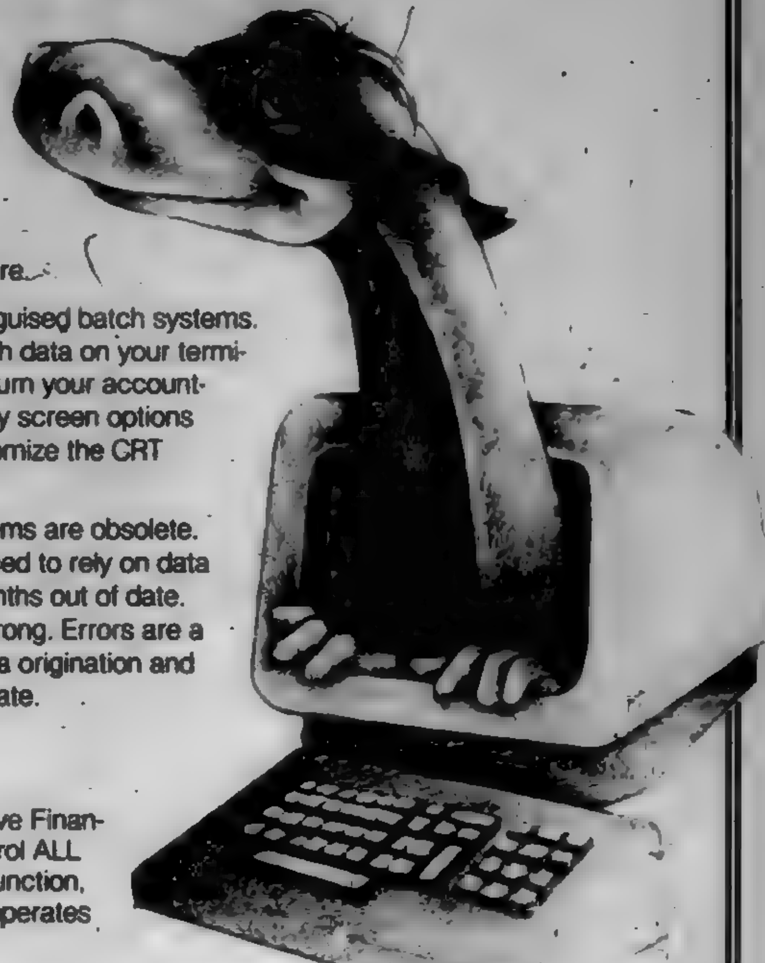
Two Firms Budget Nothing for Packages

Two of the 20 DP managers contacted during *Computerworld*'s recent informal poll about software budgets have no budget at all for packaged software in 1983.

For one manager, the reason was a totally in-house software development system. The tendency to write homegrown code was also a factor for Herb Parsons, DP manager for Armatron International, Inc. in Melrose, Mass.

However, Parsons' firm made an exception last year and purchased a canned fixed-assets system. "This year I don't see us purchasing anything else," he said.

Only two of the 20 firms contacted during the survey cited a decrease in packaged software budget figures in 1983. Both indicated that the economy was not the factor. Instead, they said, the cutbacks resulted from the idiosyncracies of the individual businesses and their cycles. ■



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A Temporary Halt

(Continued from Page 29)

crease similar to last year.

Robert Bernard, director of management information systems for Engelhard Corp. of Carteret, N.J., said his 20% increase for packaged software reflects his firm's planned installation of an IBM 3083 in 1983. Moreover, Engelhard currently is going through a DOS-to-OS conversion.

"The economy is really not a factor as far as operating packaged software goes," Bernard said. "The purchase of software pretty much has been in line with planning."

In terms of applications software, Engelhard has relied mainly on homegrown code. An "advocate of packaged software," Bernard will be looking in this direction in the future.

GATX Corp. of Chicago will show a decline in packaged software as a percentage of its total software development activity in 1983, according to John W. Edwards, the firm's corporate director of information systems. "The purchased software represents an incremental cost for us, whereas relying on our own development we can tend to work with existing resources," he explained.

The firm will spend roughly 60% to 70% of its software budget on internally developed software and perhaps 30% to 40% on purchased software. "There will be more emphasis on things like productivity tools and software packages like that than on completed systems," Edwards noted.

The decline will be felt most sharply in applications packages. "In the area of systems software, I expect our expenditures may be up slightly. In applications software, they will be down," Edwards said.

The opposite will be the case at Fireman's Fund Insurance Co. of San Rafael, Calif., according to Jerome Sommerhauser, senior vice-president of systems. Applications software will be up considerably (in excess of 30%) and systems software will be down from 1982 figures.

"Basically, we are not going to convert to [MVS] XA next year. We are pretty much converted on the [IBM] 3081. We don't see a big increase in either numbers of CPUs or performance software," Sommerhauser said.

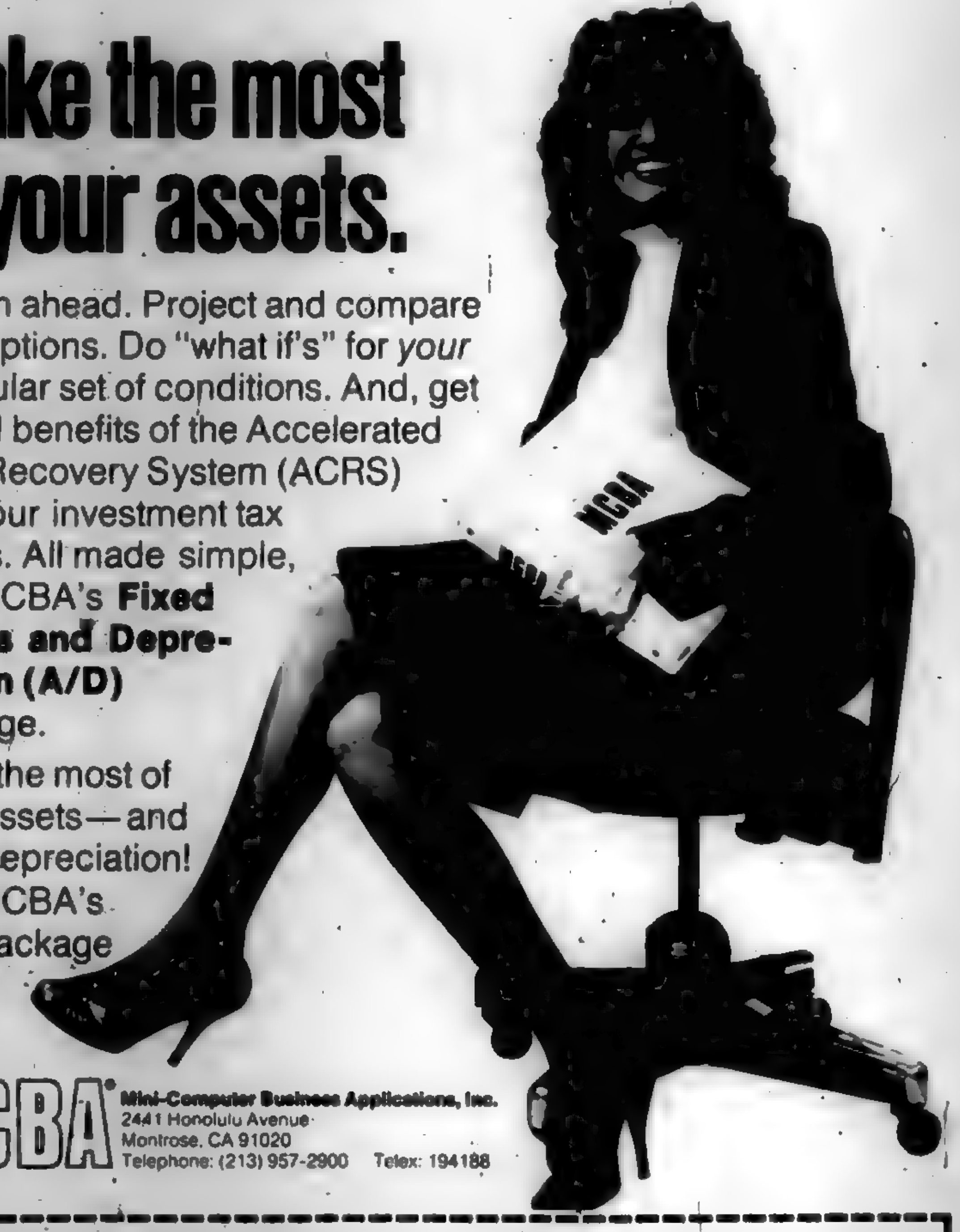
The increase in the applications software budget will total about $750,000 and will mainly be used to provide software to handle new processing requirements for a Fireman's Fund subsidiary.

Sommerhauser said the economy had "a lot to do" with the firm's postponement of conversion to MVS/XA in 1983: "It would be a big, big conversion for us." Howevet, Fireman's Fund did not hold off on buying packages in 1982 because of the economy. "Anything we can buy, we'll buy, as opposed to making it. It is always a lot less expensive. If we can find something that fits our needs, we'll always buy," he added.

Jewel Companies of Chicago is one of four firms that anticipates its 1983 budget for packaged software will be about the same as that of 1982. According to Steve Adams, corporate vice-president for information services, the leveling off is not a result of decreases in activity but because the company purchased a lot of software in 1982 to handle a newly installed centralized system.

Bruce G. Curry, staff vice-president of management systems and services for Hertz Corp. in New York, expects 1983 to be a "very flat" year in terms of packaged software expenditures. One reason: No major replacement projects are under way because of belt-tightening in the face of a heavily competitive year.

In addition, the existing major software packages are in place at Hertz and do not require much modification. "The effort to upgrade, from a cost standpoint, would not be warranted," Curry said. ■



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Business Graphics in '83

Art For Art's Sake?

By Jim Bartimo

A speaker at a recent conference on computer graphics walked to the podium to present an unusual application. Attempting to illustrate population changes, he had manipulated a map of the U.S. so that some states swelled out of proportion and others atrophied into a shell of their former selves.

The audience reacted negatively. And its reaction was as predictable as the map was unreadable.

The graphics served not as an easy-to-read version of complex statistics, but rather as art for art's sake.

In this case, the graphics were apparently employed only for graphics' sake. Nevertheless, many businesses are finding that graphics can indeed simplify and condense reams of computer printouts.

There is no doubt that the computer graphics market is growing. In fact, the total graphics marketplace is expected to increase by 35% per year, making it a $4.6 billion dollar industry by 1985, according to graphics consultant Carl Machover.

The reason for this rapid growth and industry optimism is simple. It is easier to identify trends by looking at a graphic than by looking at figures. For instance, trying to compare a West Coast company's sales figures from 1975 to 1982 with those of its closest competitor could make for a sizable computer printout. But a single graph, if done correctly, could cover all that information and more in a single glance.

While the total graphics market often includes such vertical applications as computer-aided design and manufacturing (CAD/CAM) and medical and geographic applications, the largest boom in graphics is expected to occur in business applications — an area with as many potential users as there are DP shops. In fact, The Yankee Group predicts that by 1985 the business graphics market will be worth about $3.3 billion.

Getting Graphic

Various types of graphics — from three-dimensional images to cartography — could be referred to as business graphics, but for the coming year it is safe to limit traditional business graphics to bar charts, pie charts, graphs, word slides and perhaps a few other basic formats. Donkey Kong, Tron and even some television commercials are computer-produced graphics, but they are technologi-

(Continued on Page 34)

Jim Bartimo is a Computerworld *senior writer.*

(Continued from Page 33)

cally more sophisticated than the type of graphics likely to be seen in the boardroom.

There are three basic uses for business graphics:

- Among peers, where rough graphics are acceptable.
- For formal presentations, which demand high-quality, more polished graphics.
- For on-line applications, such as decision support systems (DSS).

Rough graphics, or peer graphics, is characterized by slightly jagged lines and letters of less than typeset quality. As the term implies, high resolution is not necessary when presenting figures to one's co-workers and immediate supervisor.

Peer graphics is expected to become a high-growth area in the coming year, but probably not as strong a growth area as the next level of graphics quality, referred to as presentation graphics. This type of graphics is characterized by clear, sharp images and high-quality lettering.

While peer graphics might include color, presentation graphics is almost certainly in color and almost always prepared for meetings with the chief executive officer or the board of trustees.

Presentation graphics is likely to be one of the higher growth areas in 1983, based on figures from a 1980 study conducted by International Data Corp. (IDC), which found that 85% of the people in management in-

Which Terminal Technology Will Survive?

Because it is a truism that if the graphics can't be presented, then the concept is worthless, the driving force behind business graphics is the CRT terminal — loosely defined as the workstation on which the actual graphics are created.

In a 1981 study, International Data Corp. (IDC) predicted that unit shipments of graphics CRT terminals will grow in dollars by 28% until 1985, when sales will total $1.3 billion. The active growth in this market is likely to determine through natural selection which technology will survive.

A struggle over which terminal technology — raster or stroke — will be most accepted by users is currently under way. Raster technology refers to a constant left-to-right scanning by an electronic beam, which draws lines by lighting specific points on the screen while scanning. Stroke technology is more closely related to how an artist would draw a line — lighting up an area between two defined points.

Combining and perhaps confused with these two technologies is the refresh-and-storage method of image retention. A refresh terminal, such as the Digital Equipment Corp. VT 125, constantly redraws the terminal image, allowing the user to erase parts of the graphics. Storage terminals, such as the Tektronix, Inc. 4006, draw an image that must be changed by erasing and starting over.

A stroke-refresh terminal is usually referred to as a refresh terminal, while stroke-storage and raster-refresh terminals are called storage and raster CRT devices. A fourth technology is the plasma terminal, which uses an array of neon bulbs to produce images on a flat screen.

For business graphics, the user is expected to settle on the raster and refresh terminals and weed out the others. IDC predicted that 100,000 raster units and roughly the same amount of refresh terminals will be shipped in 1983.

The cost of these terminals has been dropping and should continue to do so in 1983. Refresh terminals can range in price from $9,000 to $50,000, raster terminals from $2,000 to $100,000. The advantages of low costs, good color and a low rate of "flicker" in its imaging will make the raster terminal a product to watch, according to graphics consultant Carl Machover.

Overshadowed by Micros?

But all this talk of terminals in business graphics may be short-circuited to some degree by the personal computer. While the quality level of microcomputer graphics is only at peer level today, the price of $5,000 or less for a complete graph-making system is attractive.

Software such as Visicorp's Visiplot makes it possible for the user to easily plot figures on a graph, and pen plotters for micros can cost as little as $1,000. Hardware costs encompass only the cost of the micro itself. Perhaps for these reasons, The Yankee Group predicts that personal computers will account for $622 million, or 19%, of the $3.3 billion business graphics market by 1985.

In the final analysis, the use and quality of computer graphics depends largely on who in the organization is creating them. Larger, turnkey systems are now ideal for end users in ad agencies and graphics art departments. Data base interfaces to a graphics program are more ideal for decision support. ■

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formation systems departments wanted business graphics primarily for management presentations.

The final and perhaps most tenuous application of computer graphics is for DSS. Because this burgeoning technology is aimed at the most persnickety of users — senior managers — this type of graphics will be derived from on-line information and will be available at the touch of a button or even the touch of a screen.

DSS graphics will obviously not develop faster than the growth of DSS itself, which is not remarkable now and is not likely to be in 1983. However, the president of Computer Pictures Corp., David Friend, believes DSS graphics "will be the highest area of growth in 1983" because it is the perfect solution to the inherent DSS problem of too much information in an unreadable volume.

The Graphics Picture

Terminals are not the only medium for viewing graphics. Again, it depends on the audience for the graphics. Peer graphics, for instance, are more likely to appear on a screen than presentation graphics, which commonly appear on a slide.

Slide preparation hardware is one of the limiting factors in business graphics. While everyone would like an attractive slide, not everyone is willing to spend from $1,000 to $300,000 for a slide maker, which must be used to produce thousands of slides to justify the expense.

Hard-copy output is as rich in technologies as it is in uses. On the high end of the scale, ink-jet and laser printers will yield presentation quality. On the low end, high-speed dot matrix printers will suffice for some peer graphics. But the latest trend in hard-copy output is the pen plotter.

There are two basic types of pen plotters: drum, on which the paper moves under the pen on a cylinder, and flatbed, on which the pen moves over the paper, mounted on a flat surface. Drum-type plotters range in price from less than $1,000 to about $250,000, while flatbed plotters can cost up to $150,000.

In another IDC report, released in 1982 and focusing on graphics in office automation, pen plotters were predicted to occupy 34% of the market by 1986. Surprisingly, impact dot matrix came in second, with an anticipated 21% of the market.

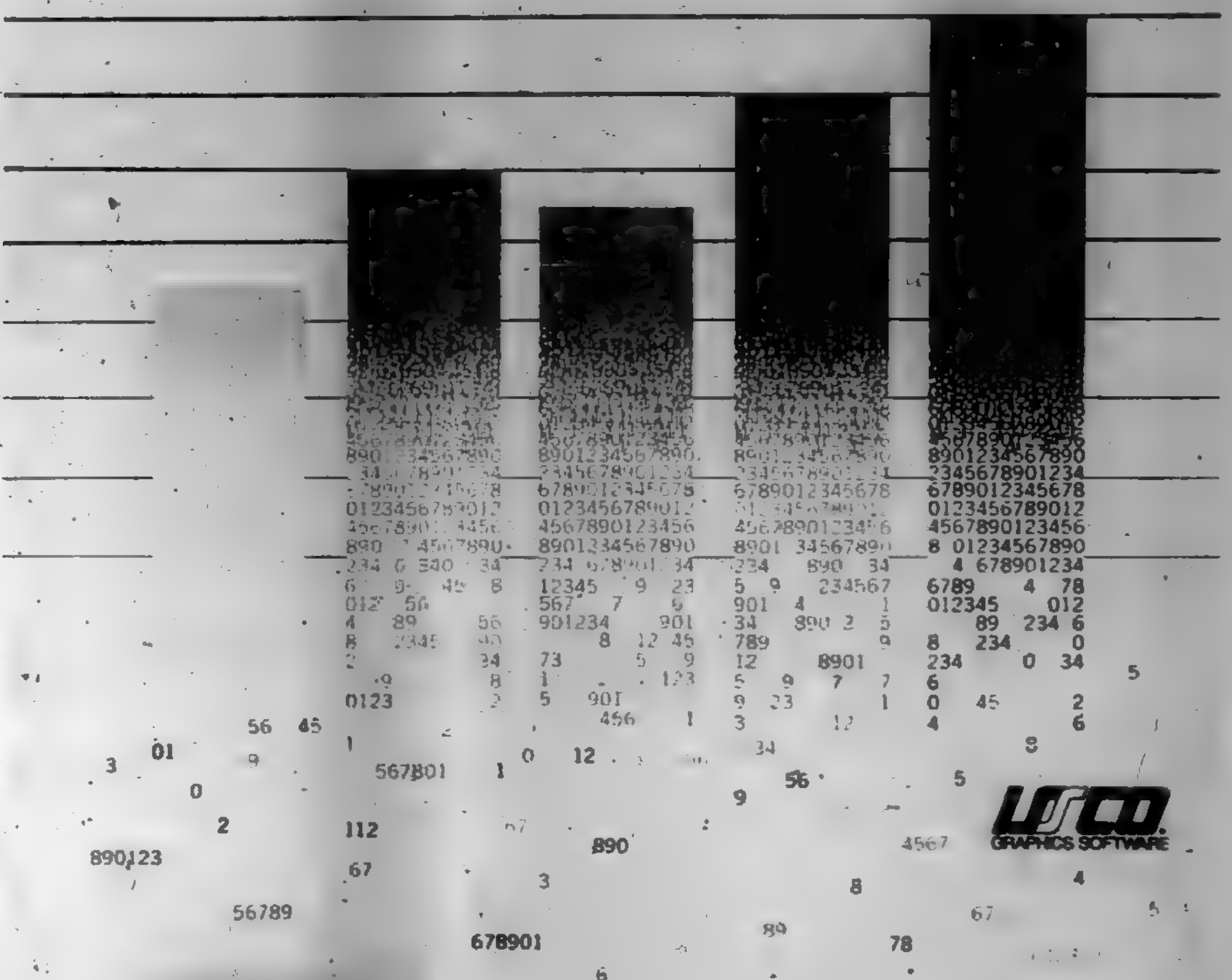
High hardware costs are a limiting factor in the growth of business graphics. But, like hardware in other areas of the computer industry, graphics equipment costs are coming down, consultant Machover said.

Ease of use is another factor that must improve before non-DPers turn to graphics for some answers, he noted.

The price of graphics software has also been a limiting factor. Graphics subroutines from vendors such as Issco, Inc. (Displa) and Precision Visuals, Inc. (Grafmaker) can run from $12,000 to $35,000. An alternative is graphics device drivers, which range from $1,000 to $5,000, but rely heavily on an expert programmer, according to Machover.

Perhaps the biggest software problem that has faced the graphics user is the inability to create a graph from information in the corporate data base without rekeying. However, the purchase of Computer Picture Corp. by Cullinane Database Systems, Inc., a mainframe software company, is expected to result in a marketable interface between the mainframe and the graphics terminal.

Despite the growth of computer business graphics, they are not as visible in the average DP department as figures sometimes indicate. Many departments now shy away from the technology because of its disadvantages. DP departments were generally established in the early '60s to deal with the proliferation of numbers on paper. Graphics will now help the DP department deal with the proliferation of computer printouts. ■



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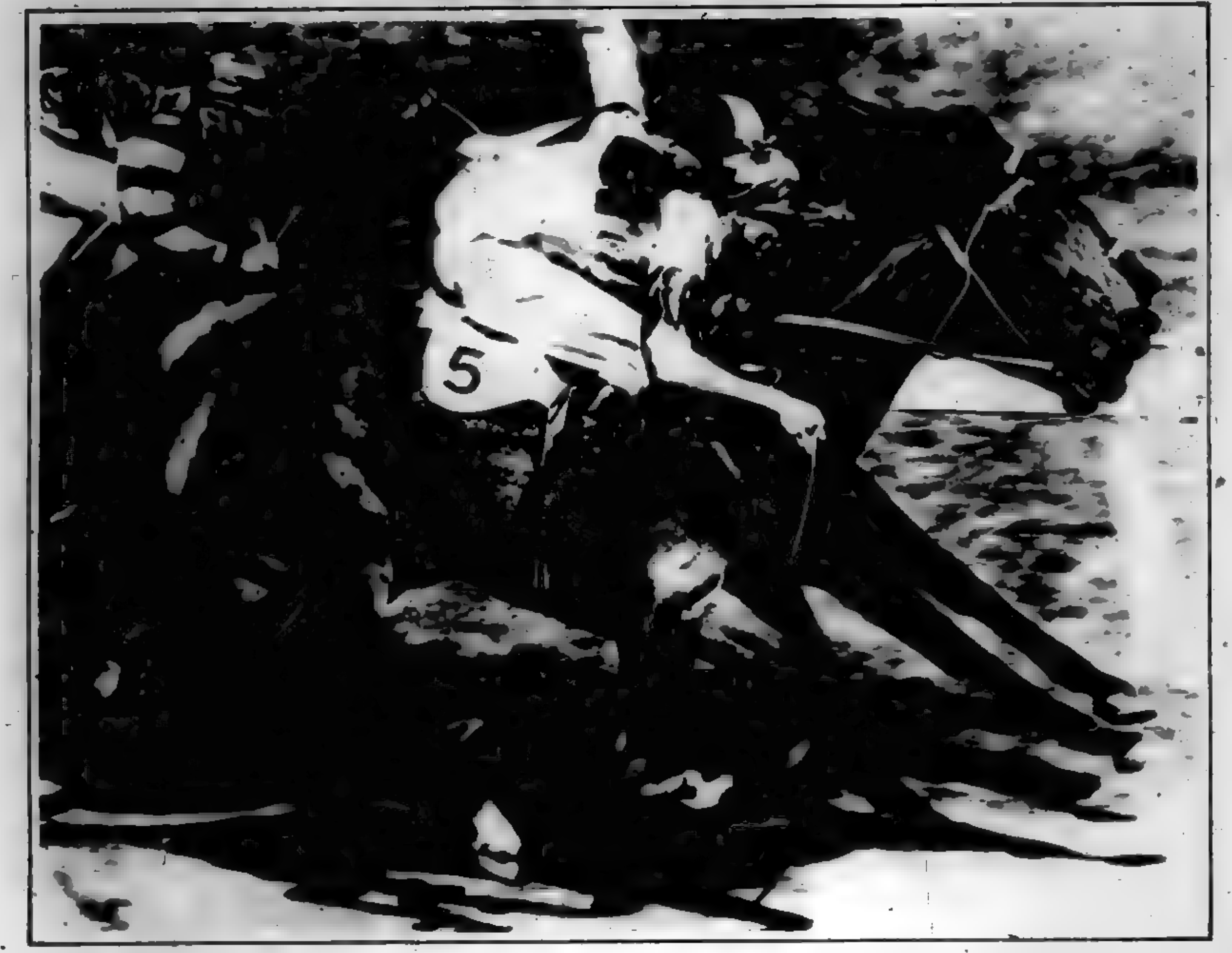

Benchmarking the Big Machines

Horsepower or Horse Feathers?

By Tom Henkel

Finding out what really goes on inside your processor has been described as everything from an exact science to a black art. Systems have become so large and complex that it is impossible to evaluate a computer system as a whole.

In theory, accurate performance information allows the DP manager to make the most of a processor's resources. In addition, performance information is vitally important for DPers deciding whether to expand or replace a system.

Experts in performance evaluation say the secret to processor rating is a keen understanding of the system's work load — knowing exactly what goes in and what is expected to come out. In complex multiprocessing, interactive and networking environments, however, the actual system work load at any given time can become somewhat abstract.

Traditionally, DPers have relied on benchmarks to evaluate a system's performance. But the word "benchmark" itself often defies definition — generally accepted definition, anyway.

Benchmark usually describes a set of software programs that theoretically represent the essence of how a computer system functions. But as Thomas Wyrick, a benchmark specialist with the Federal Computer Performance and Simulation Center in Washington, D.C., observed, the term has been used to describe everything from exacting scientific testing to playing around on various systems.

Proponents of benchmarks say a structured, scientific test is the only way to accurately measure processor performance. Furthermore, if they are conducted properly, benchmarks can provide a controlled, logical and defensible study of an organization's DP environment that can serve as a framework for current and future DP operations.

Critics of benchmarking maintain that the process is costly and time-consuming, and that it has been obsolete since the days of single jobstream batch processing. Bob Bolder, a researcher in Mitre Corp.'s Information Systems Department, said benchmarking techniques tend to break down when used with the complex operating systems, data base management systems and software that run on today's big systems.

Bolder further argued that today's systems are so complex, there is no guarantee a given benchmark will execute the same way each time the programs are run.

"It often costs more to benchmark [than to buy] the system," Bolder remarked, adding that aside from testing his current system, a DPer often does not have the luxury of performing extensive tests on a variety of processors before deciding which one to buy.

Tom Henkel is a Computerworld *writer/analyst.*

On the other hand, some researchers contend that carefully designed benchmarks can be extremely beneficial. Just using pilot tests — a representative jobstream — to test a computer's performance can often be worse than doing nothing at all, they claim.

Nevertheless, some form of benchmark appears to be the foundation of most vendors' claims for processor performance. IBM, for example, recommends a "full-function benchmark," or one that includes remote terminal emulation to host applications in data base and interactive environments, as the most accurate foundation for a performance evaluation.

Bill Fay, who conducts large system benchmarks at IBM's Gaithersburg, Md., System Support Facility, said a properly developed benchmark can often last the lifetime of a system and prove a great asset in deciding how to expand the system. In addition, Fay noted that if the user plans to investigate another vendor's system as part of an expansion program, it is often more practical, and certainly less costly, to convert a defined jobstream to the other vendor's operating environment.

Benchmarking Roadblocks

The biggest roadblock facing performance evaluators is the fact that no two DP shops are exactly alike. A benchmark that works well for one shop may be inadequate for another.

Furthermore, many DP shops simply do not have the expertise, or cannot devote the time, to develop benchmarks that are as exacting as, for one example, a chemistry experiment.

Few researchers will go as far as quoting a formula for evaluating performance. In fact, there do not appear to be any generally accepted ground rules to processor evaluation. Most evaluators are quick to caution that evaluation methods that offer formulas to determine quickly a processors' performance — like millions of instructions per second (Mips) ratings and the Fortran-based Whetstones — are unreliable and downright foolish if used as the sole evaluation method in determining which processor to buy.

Choosing the Right Mix

Choosing the right job mix is the most critical part of developing a benchmark. That process, Mitre's Bolder pointed out, requires an understanding of how an organization's system actually works. After the work load has been defined, there are many methods of calculating performance.

IBM's Fay, for example, noted that benchmarks can be developed to study a variety of factors including the elapsed time per job, the transaction response time and the number of jobs processed in a given time. Which factors are most critical depend on the individual application.

Unfortunately, simply benchmarking a computer system may not be adequate for those users attempting to get an idea of processor performance. Most large processors today have enough raw power to manage just about any application, Bolder noted. Just how efficiently the job gets done can often be a function of the operating system, applications programs and networking techniques used. To accurately test a system, those factors should be considered as well.

Most mainframe manufacturers offer software designed to test the performance of the operating system and applications programs. IBM's Fay, for example, noted that IBM offers the Resource Management Facility (RMF) for large MVS-based systems and that many third-party software vendors offer similar packages.

> *"The biggest roadblock facing performance evaluators is the fact that no two DP shops are exactly alike. A benchmark that works well for one shop may be inadequate for another."*

While it may not be a consolation for the DPer in search of a benchmark, both Fedsim's Wyrick and Mitre's Bolder agree government agencies looking to evaluate systems have a much harder time than their counterparts in the commercial sector. It often takes years to request bids, select and gain approval to buy a system. And while commercial users have the option of upgrading their systems if they find they underestimated their power requirements, government agencies often have to begin again from scratch, which can take several more years. ■

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Benchmarks Available in Six Basic Varieties

There are six basic types of benchmarks that can be used to evaluate processor performance, according to IBM benchmark specialist Bill Fay. He noted, however, that not every benchmarking method is appropriate for every application.

A full-function benchmark is the most accurate and reliable way to evaluate system performance, Fay said. That type of benchmark consists of a representative work load that also evaluates remote terminal emulation to host applications.

The full-function benchmark can be used in batch/interactive, data base or on-line applicatons.

Another way to measure performance is to focus on an application that consumes most of a processor's resources. This "dominant job" method, while successful for some applications, often makes it difficult to project system growth accurately, Fay said.

Users can also use benchmarks to look at parts of their systems. A batch stream, for example, can evaluate a critical application or segment of the system, Fay said.

Synthetic jobs, or models of jobs, can simulate both existing and potential applications. Fay noted, however, that the job models require close scrutiny to ensure they test the system adequately.

Kernels, or segments, of a work load can be used to measure the CPU-intensive or I/O-intensive segments of the system.

Millions of instructions per second (Mips) ratings can be used to measure processor performance. Mips are generally used as a measure of raw processor power. ■

Other Ways To Measure

Benchmarks are not the only game in town for users who want to come up with some measure of processor performance.

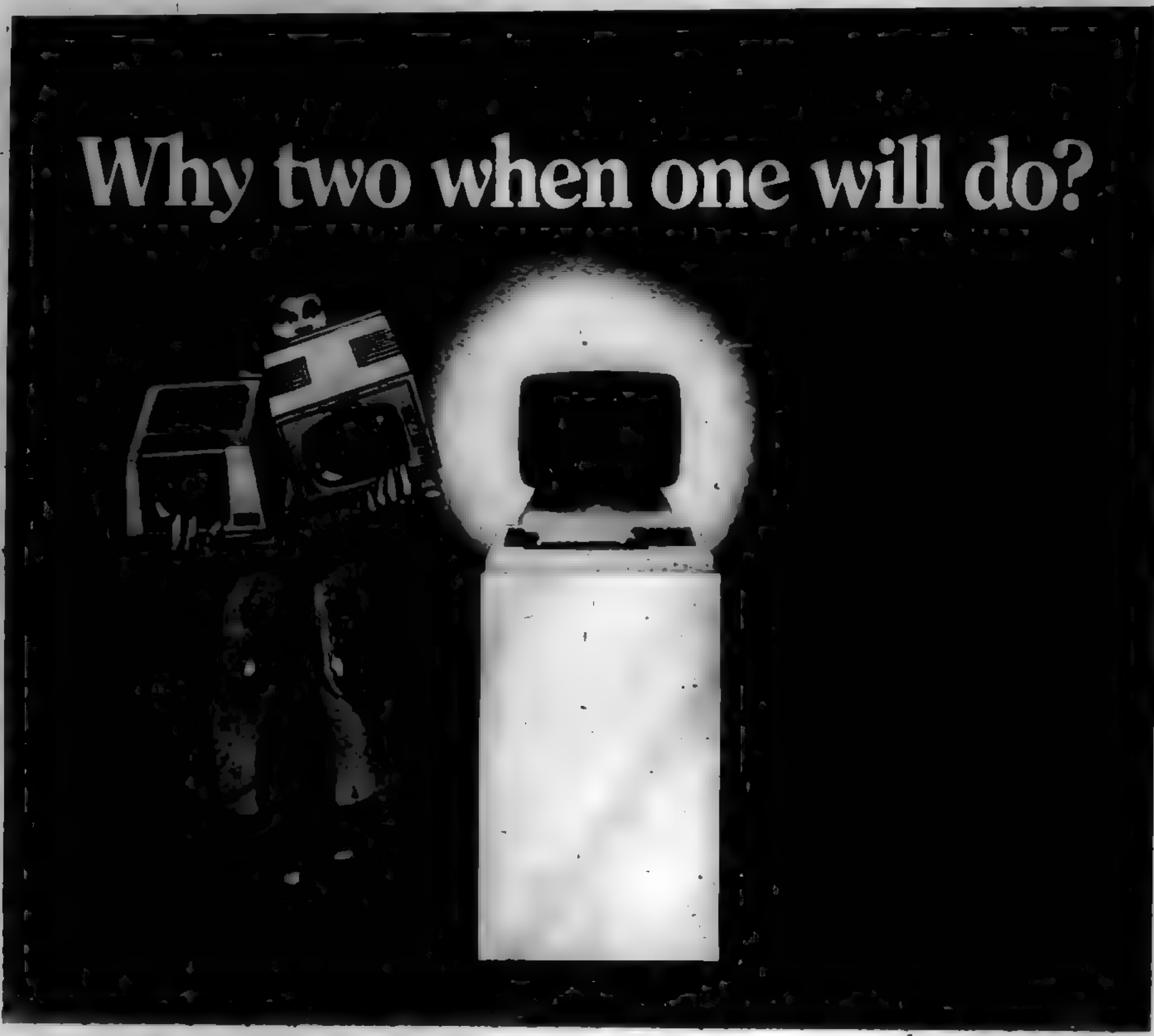
One option that some researchers say can be as efficient as a benchmark is a model that tests how a processor will react to simulated conditions. However, Bob Bolder, a researcher in Mitre Corp.'s Information Systems Department, noted that the more complex the model, the more accurate it usually is.

Like benchmarks, models usually require some degree of sophistication to develop. They can also be costly and time-consuming. Bolder cited the example of one federal agency that has been trying to develop an accurate model for five years.

There is another alternative to benchmarks: Users can develop a "subjective" evaluation of processors by looking at information supplied by the vendor. Proposals submitted by computer vendors hoping to woo new customers can prove telling, according to Mitre's Susan King, who recently completed a report on benchmarking alternatives commissioned by the National Bureau of Standards.

The experiences of other users can also be helpful in rating processor performance. While benchmarking proponents point out that each shop is different, King observed that how well a processor ran for other users can help the DP manager.

Rating charts, such as Computerworld's annual Hardware Roundup, and similar charts from other trade publications and from consultants can also be helpful, King said. Benchmarking proponents say such charts are unreliable if used as a major part of a decision-making process. ■



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Computer Economics in '83

Lease, Rent or Buy?

By Marguerite Zientara

Should you buy, rent or lease computer equipment in 1983?

The answer depends on your company's cash position, the likelihood of technological obsolescence and the amount of flexibility you want.

Mark Levin, a principal with Peat, Marwick, Mitchell & Co. in Boston, believes that the decision to buy, rent or lease is "definitely not a DP decision." It lies instead with a company's financial officers.

Once the DP department has made its decisions on DP issues — ascertained the size of an upgrade, for example, the number of processors, the potential migration path, the effects of system disruption — then it is up to the chief financial officer or his representatives to decide how to pay for the desired changes, Levin said.

With all your data in hand, show the financial people "what it would cost to buy, what it would cost to lease on a three-year basis, and what it would cost to lease on a five-year basis," Levin said.

By telling the finance department all the terms and conditions involved, the DP department can present various scenarios. According to Levin, DP can tell finance: "If we were to lease on a five-year basis and then wanted to go ahead and upgrade sooner than we anticipate, here's what we'd have to do in order to do all that.

"Once it's all laid out, it's really a matter of the company's financial people sitting down and figuring out which is the best financial alternative, given their cash position and given the tax implications of all the alternatives," Levin observed.

But Edward Cherney, the board chairman of the Computer Dealers & Lessors Association, said, "The predominant method used today is leasing."

Cherney, who is also president of CMI Corp., a used equipment dealership in Troy, Mich., explained that "Whether a company makes Dixie cups or bubble gum, it would rather use its own capital for those capital assets that are making Dixie cups or bubble gum instead of for their computer equipment."

"Deciding to purchase means that you kind of lock yourself into the technology," pointed out Thomas R. Mylott III, an attorney with the Dallas law firm of Peter S. Vogel P.C. "But that's not necessarily bad."

It simply depends on the user's needs. "If you buy a car to go back and forth to work, you don't really care if somebody comes out with a nicer car two or three years later, as long as yours still gets you back and forth to work," he noted. "So if the user buys the hardware to do a specific job and it still does the job, it's proba-

(Continued on Page 40)

Marguerite Zientara is a Computerworld *writer/analyst.*

(Continued from Page 39)

bly no big deal."

But, Mylott observed, "The technology has been changing so quickly that the changes in performance-to-price ratios are not behaving in a predictable way. It could be that you bought a computer that pretty much did the job, and you paid $50,000 to $100,000 for it. Then the next year the PC [Personal Computer] came out and you saw that for $3,000 you could do the same thing you had paid all that money for . . . If you want to switch to the IBM [Personal Computer], you've got a piece of hardware that may not be worth much on the used hardware market."

If, however, the user rents the $100,000 machine, he may be able to pay a cancellation charge and get out of his contract — still an expensive proposition, but not nearly as expensive as a $100,000 purchase price tag.

Unload at Loss

Given investment tax credits and accelerated depreciation, "It may still be advantageous to buy something if you're willing to recognize that at some point in time you'll have to unload it, probably at a loss, compared with its value on your books," Levin observed.

At the other extreme, the cost of renting is prohibitively high, Levin said, "because whoever you're renting from doesn't want to bite the bullet for technical obsolescence."

"Basically, it's a question of being able to keep up with the state of the art without having to bury the equipment yourself at the end if you've bought it," explained Susan Nycum, a partner with the law firm of Gaston Snow & Ely Bartlett in Palo Alto, Calif.

"People may want to keep up with state of the art because their application requires it or because they want to keep good people, and good people won't stay around with last year's model," she noted.

Mature Application

On the other hand, some people want stability in a mature application where the machine will just "grind out the work rather than to impress anyone or to get a tremendous amount of throughput, which is possible on some of the newer, faster machines," she added.

In addition, there is the question of unloading the occasional lemon. "If you're leasing from a vendor, you typically have the risk of that machine being a lemon on him, not on you," Nycum pointed out.

"And if you're buying it, after the warranty period is expired, that risk of it being a lemon is on you," she added. "If you are leasing from a third-party organization, you typically have to pay them regardless of whether the machine is a lemon," Nycum said.

"Then you're supposed to somehow chase down the vendor and do battle with him," she noted, "but it's not as satisfactory as if you're in the position of saying to the vendor, who is the manufacturer and the lessor, 'I'm not going to pay the rent until you get this fixed or put one in that works.' "

Cash Position

The decision of whether to buy, rent or lease computer equipment "really comes down to a company's cash position," Levin reiterated. "If you're sitting around with money in the bank that's earning 11% to 12% and you're faced with leasing something that will cost you 16% to 17% on the lease, then you're probably better off making the purchase, because you're not getting as much money on the cash you're holding."

One of Peat, Marwick's clients, who was getting into DP for the first time, had $250,000 to spend and a choice of buying, renting or leasing. "We went out and got competitive prices from third-party lessors — what they would charge us to purchase and then we'd lease back — and then had to determine the firm's cash position," Levin recounted.

The user's money "was sitting in accounts earning interest anywhere from 8% to 17%," he continued.

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CIRCULATION 44

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"They compared the value their cash was earning against what it would cost them to lease as a percentage basis."

All factors were evaluated against the expected life of the equipment in the client's environment. "We concluded that that machine would be viable — with a couple of minor upgrades, some additional disk and maybe a tad more memory — probably for four years," Levin said. "So we made all our evaluations based on a four-year scenario.

"Economically, it made an awful lot of sense to go ahead and close out one of the low-yield accounts — they had several that were about to hit maturity — and take that money and purchase the equipment," Levin explained. "Today's interest rates are such that a lease would cost, say, 13%, and the best we could do with the money was 11%. So we saved 2% by buying."

But what if that client hadn't had a quarter of a million dollars sitting around? "The answer is obvious — they would have had to turn around and lease," he said. "Then they would have had to determine the impact of lease payments on their cash flow, and that's one of the things that sometimes determines what your leasing period will be."

Other Considerations

When a user does decide to lease, there are considerations other than financial, Cherney pointed out. "Unfortunately, there are many, many people in this business who indicate they can get a transaction completed, when in reality a large percentage of those transactions never close."

How does one determine a lessor's ability to follow through? "Ask for the company's financial statements, find out how long they've been in business, how many other users they've completed transactions for — the things you would do if you were going to buy a house and had to pick a real estate person," Cherney advised.

"It's hard to believe, but there are a number of people who've never leased before coming into the market who don't even think of that," he added. "They assume if someone has enough charisma and knowledge to talk to them about leasing this $3 million machine, they won't even doubt whether he'll get it done; they assume he can get it done. Wrong."

The contract, too, can be a trouble spot. "The general rule is that everything about the transaction — all aspects of the deal, any promises — should be reflected in a written agreement," Mylott advised. "You'd be surprised, but there are very few contracts that really do that."

In vendor contracts, for example, the promises that a sales representative makes about the performance of a machine must be in the contract to be binding, Mylott said. "Depending on the company, claims can be everything from innocuous to extravagant to perhaps even fraudulent," he noted. "It's not legally binding if it's written in a letter or in a side agreement signed by the sales manager" because "they don't usually have the authority to bind the corporation," Mylott concluded. ■

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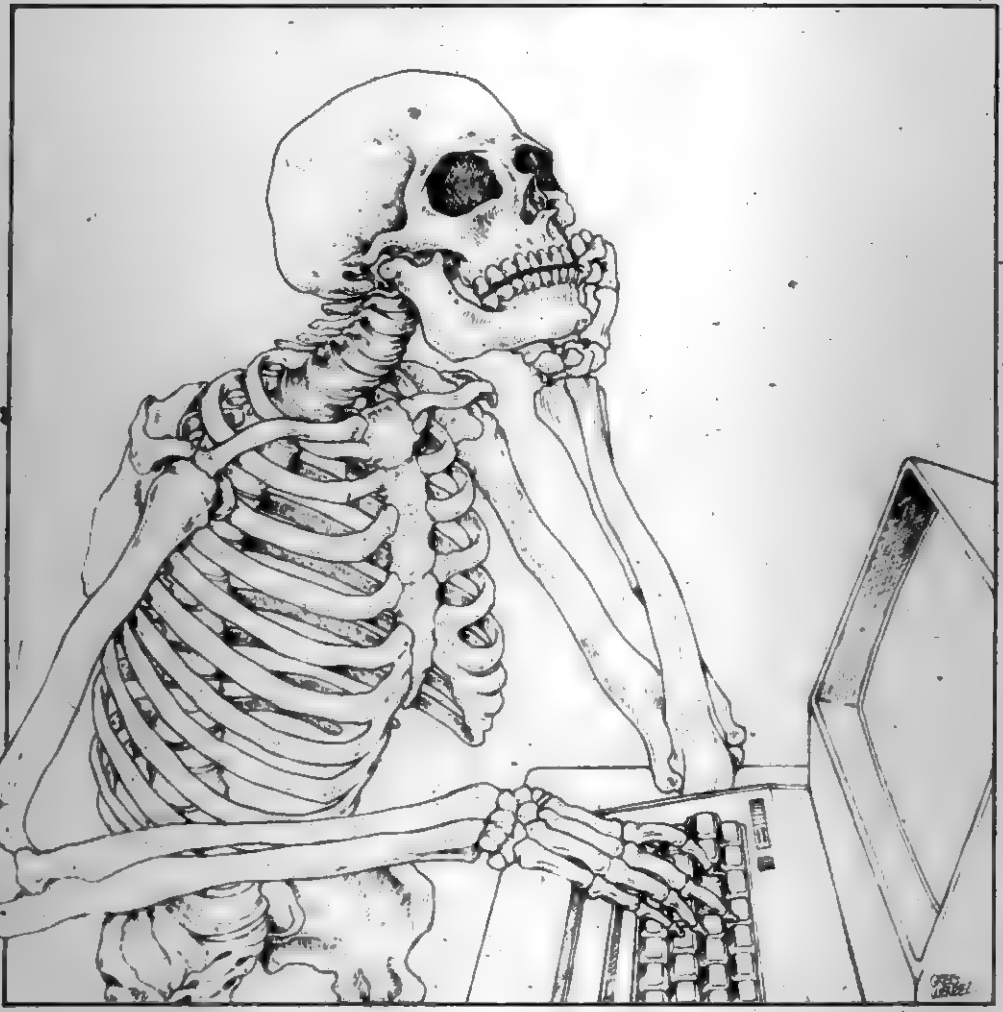

Local-Area Network Standards

The Long Wait

By Bruce Hoard

Doomsayers predicted that local-network users would wither away at their workstations before any standards would ever be agreed upon. For a while, it looked like they might be right.

Now, at last, it appears as though the 100-member Institute of Electrical and Electronics Engineers (IEEE) 802 Local-Area Network Standards Committee has come up with some standards that users can hang their networks on.

The stated goal of the committee is: "to ensure compatibility between equipment made by different manufacturers such that data communications can take place between the devices with a minimum of effort on the part of the equipment users or the builders of a system containing the equipment. To accomplish this, the standard will provide specifications which establish common interfaces and protocols for local-area data communications networks."

The committee is committed to realizing that goal within the framework of the International Standards Organization's (ISO) Open Systems Interconnection model, which is a layered architecture. In order to provide the standard, specifications are primarily required at the lowest two levels of the ISO model, the physical and data link levels.

The committee has been working to establish standards for both baseband and broadband local-area networks, two divergent and fiercely competitive technologies primarily based on coaxial cable but featuring markedly different capabilities. Baseband systems offer one channel and are most commonly used to transmit data at speeds up to 10M bit/sec while broadband networks offer multiple channels and provide video as well as data transmission at speeds up to 20M bit/sec.

Led by Chairman Maris Graube, who is also manager of corporate interface engineering for Tektronix, Inc., the committee finalized revisions to "Draft C" at its October meeting in Boston. The revised draft, known as P 802.3, will next be sent to the 500-member Technical Committee for approval before coming before the IEEE's Computer Society Standards Board and finally the IEEE as a whole. The best guess is that it will take about six months and sources close to the process say it should be smooth sailing.

The draft P 802.3 consists of three major documents covering what Graube refers to as "a small family" of standards. The line-access technologies covered are carrier-sense multiple access with collision detection (CSMA/CD) and the token passing bus. The third document represents the committee's completed work on the data link level protocols.

CSMA/CD is a contention line-access method designed for systems based on a bus architecture. In a bus architecture, the various nodes are all connected to a common bus, or cable, that provides a backbone of the network. Simply stated,

(Continued on Page 44)

Bruce Hoard is Computerworld *senior editor/communications and senior editor/office automation.*

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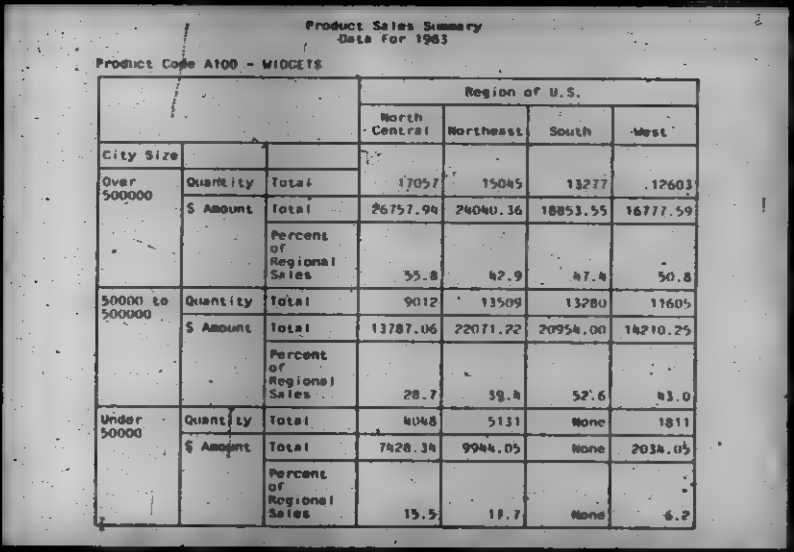

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		Percent of Regional Sales	55.8	42.9	47.4	50.8
50000 to 500000	Quantity	Total	9012	13509	13280	11605
	$ Amount	Total	13787.06	22071.22	20954.00	14210.25
		Percent of Regional Sales	28.7	39.4	52.6	43.0
Under 50000	Quantity	Total	4048	5131	None	1811
	$ Amount	Total	7428.34	9944.05	None	2034.05
		Percent of Regional Sales	15.5	17.7	None	6.2

(Continued from Page 42)

the CSMA/CD technique "listens" to determine if another station is transmitting before it attempts to send. If there is traffic, it waits, if not, it transmits.

CSMA/CD has become well known because of its association with Xerox Corp.'s Ethernet baseband local-area network.

The prospects of the CSMA/CD part of P 802.3 are looking decidedly more positive since 13 companies issued a ringing endorsement for it on December 6.

Saying that it "represents convergence of the IEEE 802 working draft, Ethernet specifications and the [European Computer Manufacturers Association] Ecma document," the release is signed by Bridge Communications; Data General Corp.; Digital Equipment Corp.; Fujitsu America Corp.; Hewlett-Packard Co.; Interlan, Inc.; National Semiconductor Corp.; Siemens A.G., Tektronix, Inc.; 3Com Corp.; Ungermann Bass, Inc.; and Xerox Corp.

The endorsement is significant because the 13 companies represent the major Ethernet-compatible manufacturers and HP has announced its intention to offer a local-area network based on Ethernet. Intel's support is important because, along with Xerox and DEC, it collaborated on the original "Blue Book" Ethernet specifications and is now offering a set of very large-scale integration semiconductor chips that act as Ethernet controllers.

Token passing is also a contention method based on a bus architecture. The technique passes a "token" of data from station to station that conveys the right to transmit. After receiving the token, the station has a certain period of time to initiate its own transmission before passing the token to the next node.

Work on a third line-access scheme, known as the Token Ring, is expected to be completed next spring. This method was thrust into the limelight when representatives from IBM layed out its parameters at an 802 meeting last spring.

As it stands now, P 802.3 addresses itself more to baseband than broadband technology. Although CSMA/CD is currently used with broadband networks, 802 has not yet produced specifications to that effect. And the token ring technique is deigned solely for baseband networks. Only the token

(Continued on Page 46)

Peddling A Patent

One of the more interesting sideshows associated with the 802 project might have been appropriately christened "Big Olof and The Holding Company Hustle."

One day last summer, the local-area network world learned that the Dutch-owned Willemijn Holding Co. was the patent holder of a token-passing scheme similar to the one being worked on by 802. Willemijn and its vice-chairman, Olof Soderblom, who developed and patented the scheme, were attempting to peddle the rights to it for a healthy $100,000 down and $45 for each additional node attached to the network.

When potential buyers failed to materialize with checkbooks in tow, the free-enterprise-minded Swede dropped his request to a slightly more modest $25,000 down and $45 per additional node. No one had bitten. Except one. A very big one. The brobdingagian leader of the pack, IBM.

Word leaked out that IBM had paid Willemijn a cool $5 million for the nonassignable rights to the patent. IBM confirmed the transaction. The firm had decided in 1980 that it would license the patent for its 8100 local loop.

The holding company has since withdrawn the patent in order to "refile it with broader claims," Maris Graube, chairman of the 802 Committee said, and work on token passing goes on apace within 802. "Whether the patent is valid or not will be settled in the courts," Graube commented. ■

Brouhaha Brewing Between Data, Video Carriers

A brouhaha may be brewing over the future compatibility of data-oriented broadband local-area networks and the video-based cable television (CATV) networks now serving large metropolitan areas throughout the U.S.

The Institute of Electrical and Electronics Engineers (IEEE) 802 Local-Area Network Standards Committee "is operating from a predominantly data orientation and in terms of installed cable and resources, the world of broadband is dominated by the video industry," Charlie Bass, co-founder and vice-president of Ungermann-Bass, Inc., said in a recent interview. "I think there is the potential of the video industry and the data carriers being in conflict of [the 802 committee's] view of these standards."

The video industry, represented primarily by the National Cable Television Association (NCTA), has not yet formulated a position on this problem, Bass added. But when it does, it will look at data integration into CATV networks from a "completely different" perspective than do data carriers, "and those folks have enormous influence in the technology."

Meanwhile, data carriers are developing standards and coming up with their own technology, techniques and frequency allocation schemes, Bass noted. These carriers have left "a fairly small" part of the bandwidth for video and are not as sensitive to the quality of video signals as the video carriers are, he explained.

Jerry McDowell, product manager for networking communications at Wang Laboratories, Inc. claimed it is too early to tell what will transpire between data and video carriers. "By making a comment on that, it would only be generating controversy before things really get off the ground.

"That's what happened in the very beginning with 802 and I'd like to avoid it," he added.

McDowell pointed out that the CATV industry is represented on the 802 committee's recently formed Metropolitan Area Network Subcommittee.

Flexible Carriers

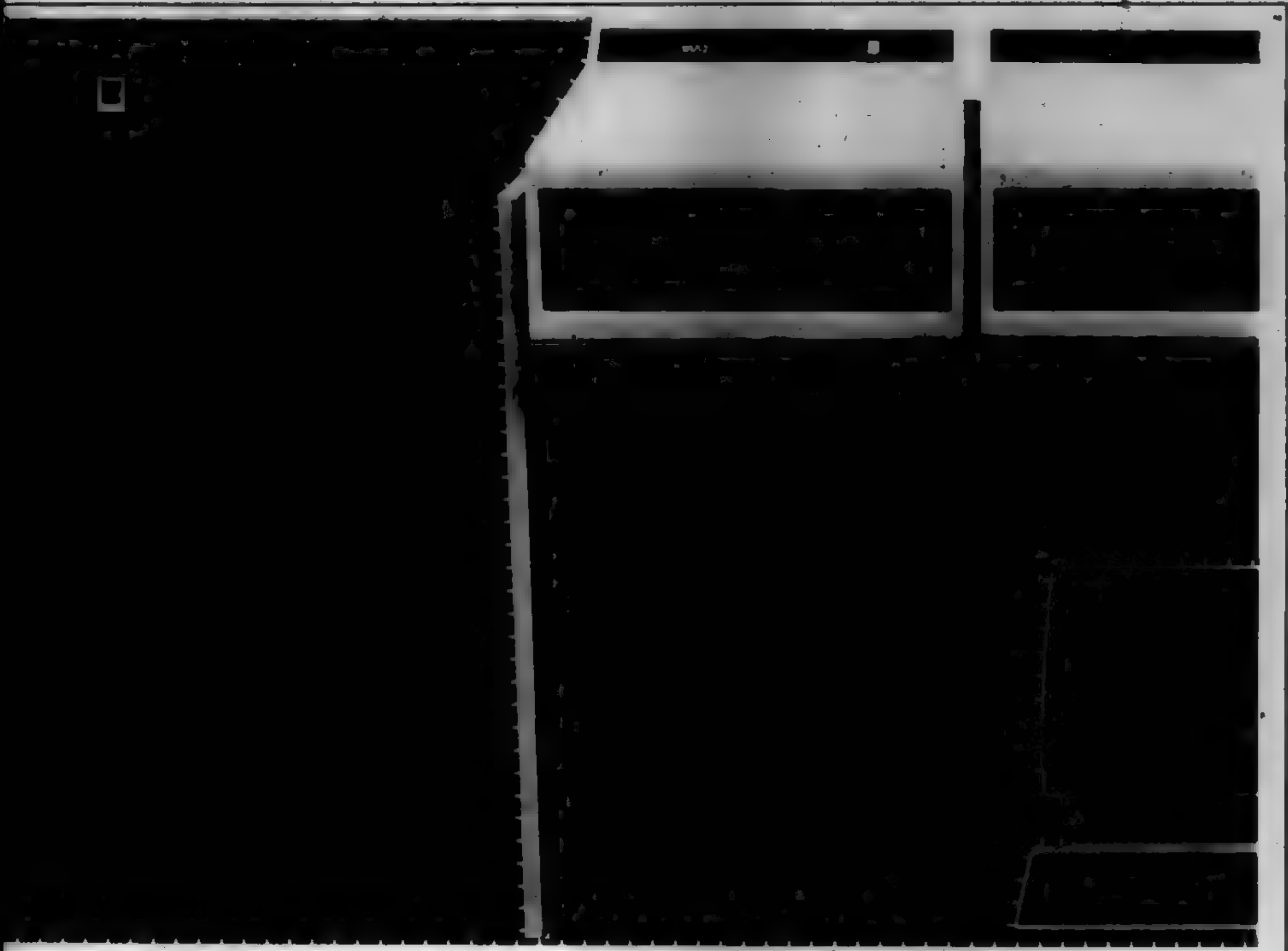
Wendell Bailey, vice-president for science and technology with NCTA, made it clear that data carriers wishing to transmit over CATV networks will have to be flexible. "After all, data is not a business," he noted. "It is not something that anybody goes out and buys . . . It's a service."

And "if people wish to transmit this service on a metropolitan area network, it behooves them to determine the flexibility of the pipe in which they intend to pour it," Bailey said.

There is a lot of room to transmit data over CATV networks and a lot of interest in doing so, Bailey added. He would like to see an IEEE official attend an NCTA Networking and Architecture Subcommittee meeting.

The NCTA official pointed out that data carriers cannot demand that CATV networks be revised to accommodate data transmission any more than video carriers can demand that AT&T readjust its dial-up network to facilitate video.

Will Zachmann, vice-president of technology assessment for International Data Corp. in Framingham, Mass., observed that CATV operators can do well by carrying data. "An operator would have to be out of his right mind to be opposed to carrying data because it's pure gravy revenue when you're talking metropolitan area," he commented. ■



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(Continued from Page 44)

bus approach has been specified for broadband use.

Most of the controversy swirling around the standardization process centered on just how close the standard should adhere to the Blue Book specifications.

Graube said the P 802.3 CSMA/CD standard "borrows a lot from Ethernet but is not quite like Ethernet."

In a recent interview, David Liddle, who was vice-president of Xerox and general manager of its Office Systems division's strategic business unit during most of the standards setting process, played down suggestions that 802 was beset by political polarization over how closely the CSMA/CD standard should resemble Ethernet.

According to Liddle, Xerox was flexible toward proposed changes in the Blue Book specs and actually revised them when it was shown that they would be improved by the alteration. On the other hand, the company refused to change the specs if in its opinion the proposed revisions added nothing to, or failed to improve them. He pointed out that at one point the 802 spec was also changed to comply with the Blue Book.

Liddle, who is now vice-president and co-founder of Metaphor Computer Systems, Inc. along with former Xerox vice-president Donald Massaro, claimed there was no anti-Ethernet block within the committee, said 802's first CSMA/CD draft was "98%" consistent with Ethernet and that differences between the two were "negligible".

What does the 802 committee's agreement on P 802.3 mean to users? We now have a very clear CSMA/CD standard that has U.S. and international support and lets lots of people build low-cost components," he said.

Charlie Bass, co-founder and vice-president of Ungermann-Bass, Inc., an Ethernet-compatible local-area network manufacturer, disagreed vehemently with Liddle's assessment of the political scene within 802.

"Absolutely no question about it," he replied when asked if there was an anti-Ethernet block within the committee. "And, in fact, that would not have been resolved had the 802 committee reorganized itself to isolate that anti-Ethernet sentiment."

The reorganization Bass referred to came last August when the committee spun off working groups for each of the three line-access technologies, CSMA/CD, token bus and token ring. Graube said the change was made because it made sense to have experts from each of them working together when it became clear separate standards were evolving in each of those areas.

According to Bass, before the change, members from the full committee were allowed to scrutinize work done in each of the line-access areas.

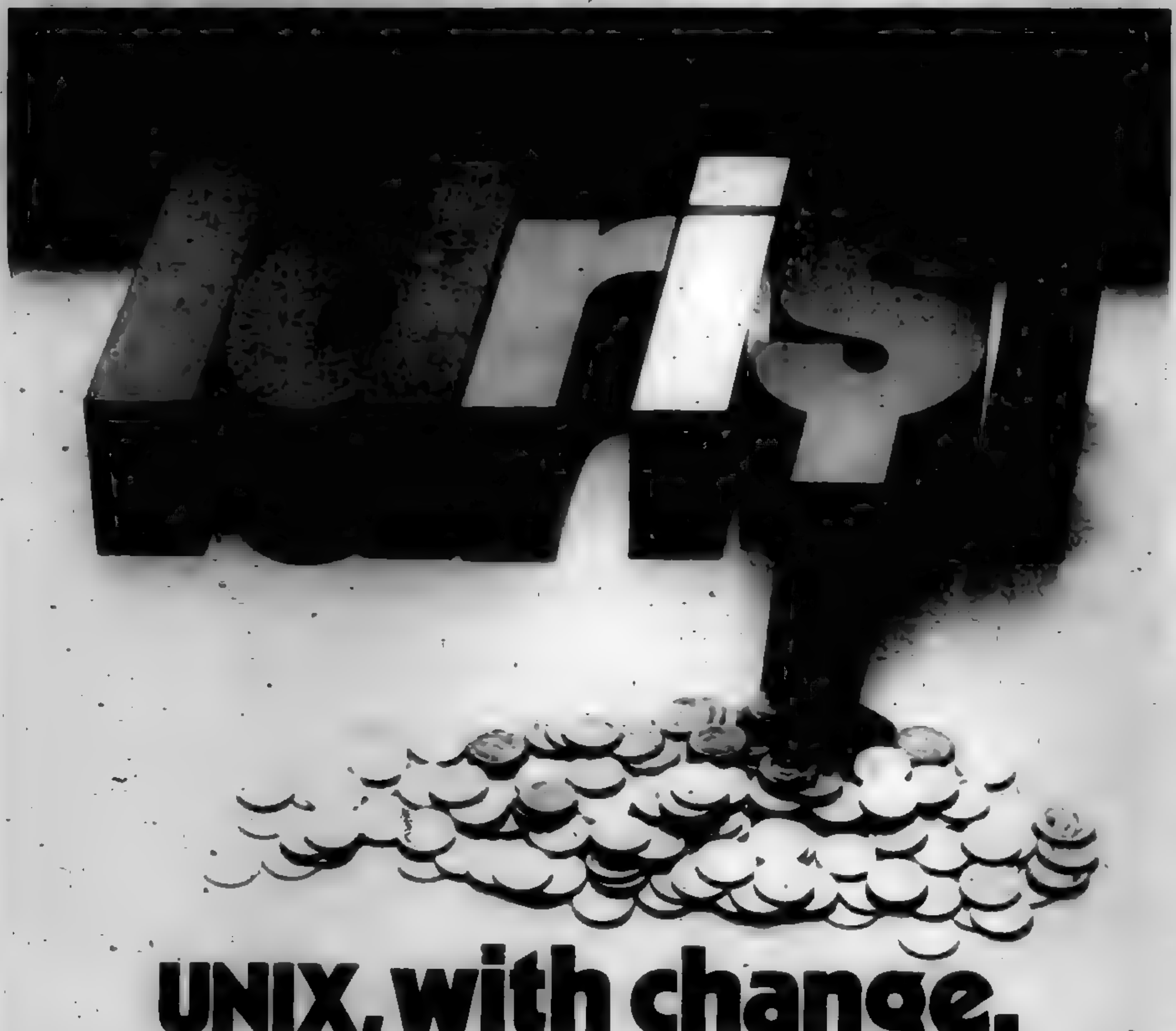
"Within the new CSMA/CD group differences from the Ethernet spec were manageable, while before other technical groups did not want the CSMA/CD technology to be successful," he declared.

The reason some members of the other technical groups did not want CSMA/CD to be successful was they were afraid Ethernet-type manufacturers would outperform them in the marketplace, he added.

Jerry McDonald, product manager for networking communications with Wang Laboratories, Inc. and an 802 member, maintained that more work should have been done on the CSMA/CD standard.

McDonald said there were problems with the frame delimiter, the block that procedes data. According to him, the evolving 802 method of dealing with that was considerably different from Ethernet, but was set aside when Ecma ratified the Ethernet approach.

McDonald, Bass, Liddle and others who followed the work of 802 agreed that the Ecma Ethernet endorsement put tremendous pressure on the committee to pound out a CSMA/CD standard that closely paralleled Ethernet. ■



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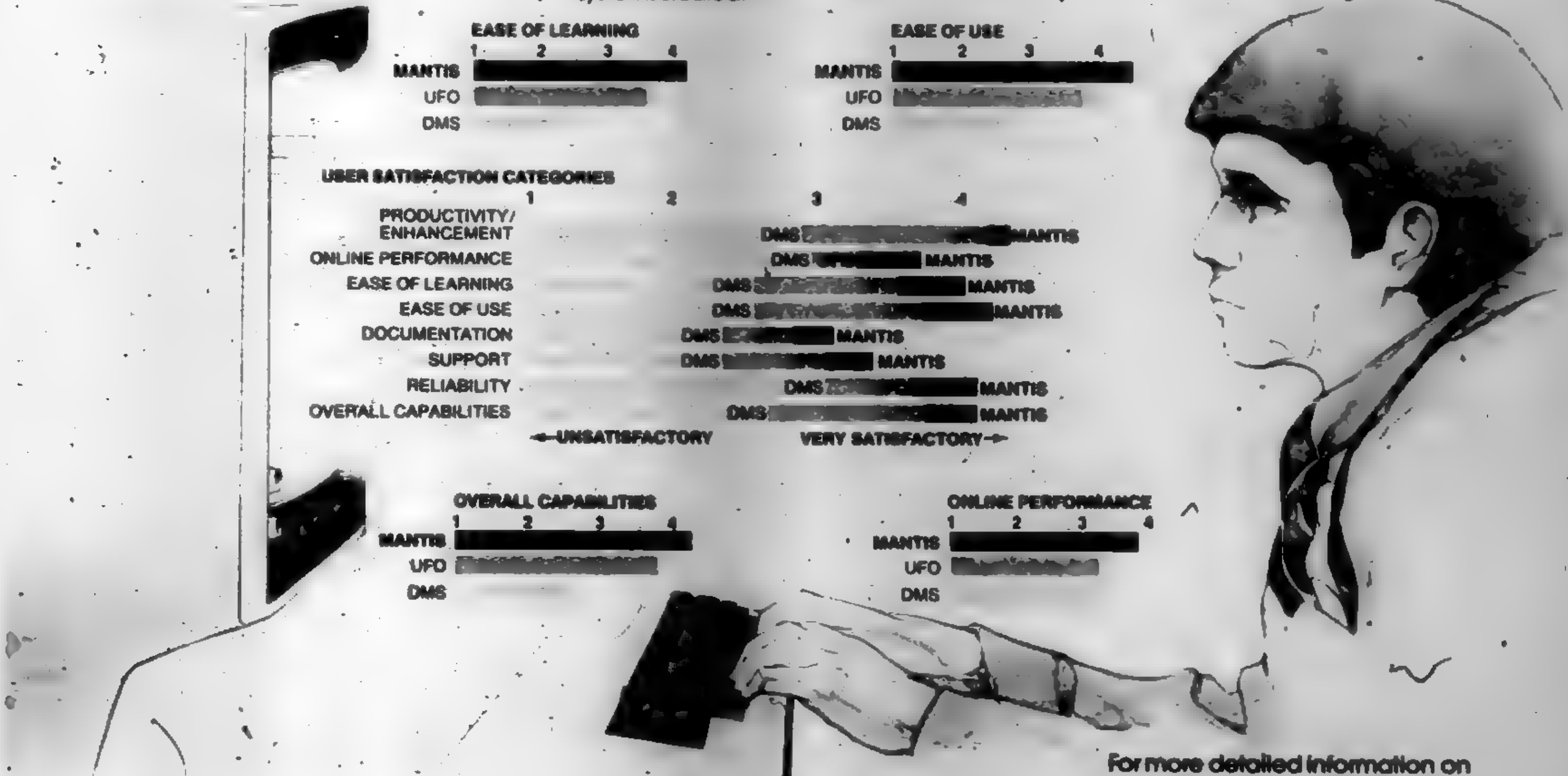

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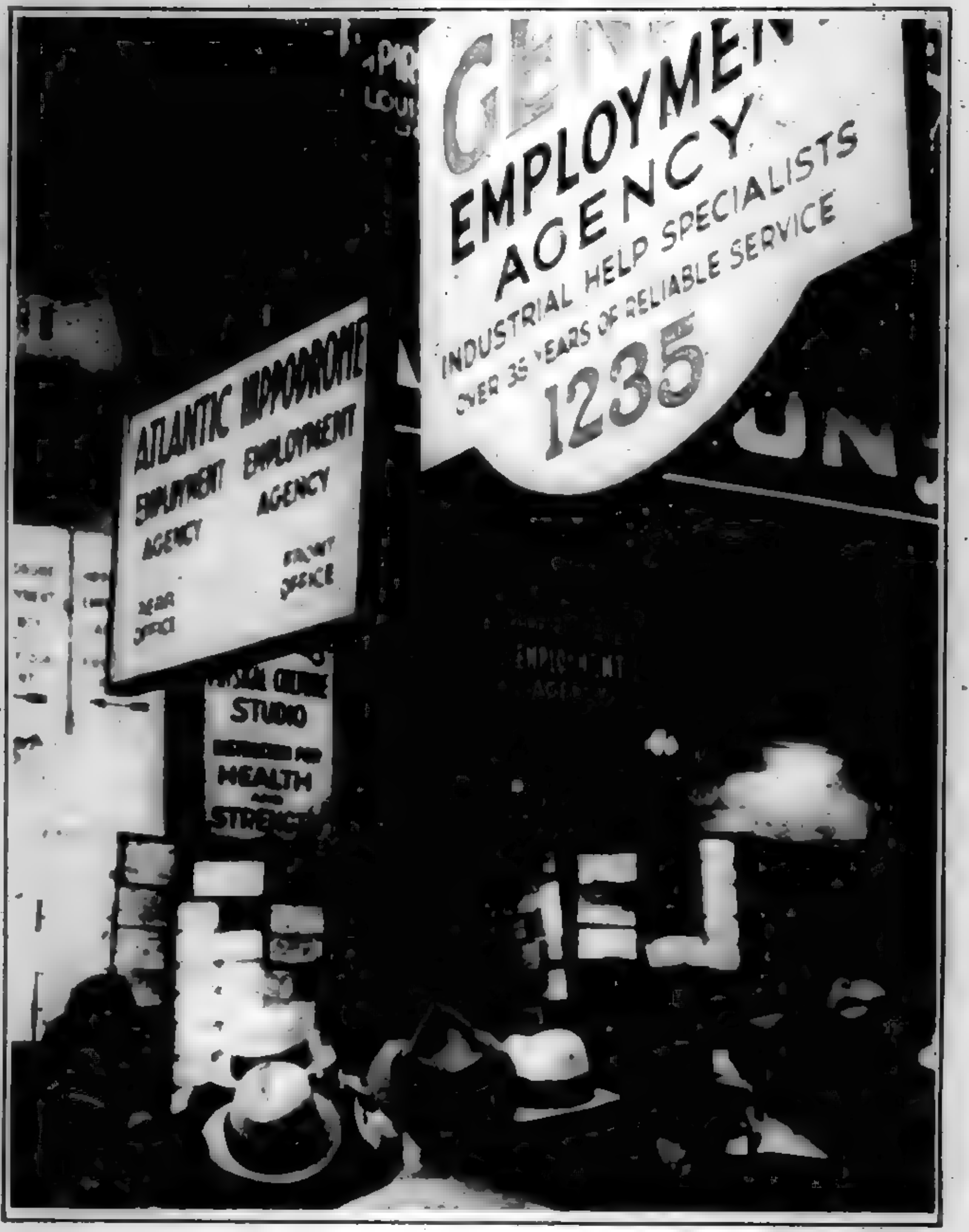

Last Year's Layoffs

What Happens to Vendor Rejects When The Rejects Are People?

By Marguerite Zientara

Unemployment in the computer industry is up — that everyone knows. But what happens to people after they are laid off from vendor companies? Do they find other jobs immediately? Do they change careers? Do they sit home and drink?

Marguerite Zientara is a Computerworld *writer/analyst.*

There are as many answers to these questions as there are unemployed workers, judging from a random survey of layoff victims, their former employers and DP-oriented placement companies around the country. *Computerworld* contacted three layoff victims: one who was let go last January but found a new and better job two weeks later; one who was laid off last January and is still unemployed; and one who was terminated in October and is still out of work.

The first, a former administrative specialist at Honeywell, Inc. — now employed by another prominent mainframe vendor — was "one of the very, very lucky ones" who "never missed a paycheck" after his January layoff notice came. Although he made use of Honeywell's outplacement services, which were "as good as they could have been," the current manager of marketing services recalled, "I had my own resume done before they did."

His new position came "totally through my own efforts," he said, while acknowledging that "the Good Lord was looking over my shoulder for a while. I was hired before any of the others who were laid off at the same time.

"Being in the right place at the right time is as important as being qualified and good at what you do," he observed. The fact that he got good recommendations from the Honeywell people he worked with and for during his two years there also helped.

This layoff victim "couldn't be happier," because "I finally got a job in my field." After an adjustment period necessitated by his move from a large firm to a small company, he has concluded that his new employer firm is "very intelligently run, the products are much more exciting and state of the art and every position is a growth position."

For those still unemployed, he feels the outlook is "obviously bleak — I hate to say it."

More Optimistic

More optimistic, but with a slight erosion of enthusiasm, is Lee Gallant of Needham, Mass., also laid off in Honeywell's January purge and still unemployed. An allocations administrator for 1½ years at Honeywell, Gallant is looking primarily for a job in sales and marketing administration, although he is starting to lower his sights to just sales "as a way to get started with a company." Honeywell's outplacement services were "very helpful in terms of being a good place to look at trade publications and use the phones, but they were not geared to offering individual help," according to Gallant. "It was fairly well done and useful if you took it for what it was."

Relying heavily on personal contacts, "friends of friends," informational interviews and referrals, Gallant has "talked to quite a few companies, but I've run into hiring freezes." In addition, when companies "cut down to the bare bones to survive, they tend to get rid of administrators, people they feel they can do without."

What is Gallant's outlook after 11 months of job searching? "I really don't know," he said. "I have a little more optimism about the economy, which may look up a bit after the first quarter, but that's just a guess.

"I'm trying to be optimistic," he added. "I still believe in myself and believe I can do a good job for a company. I just need more exposure and feel if I can get it, then I will get a job."

Gallant has sent out about 100 resumes, "maybe more." Although his financial state is not critical yet because his wife has "a good job" at Honeywell, he said "if this goes on significantly longer, we'll be in a little bit of a bind."

In general, Gallant feels that "it will still take some time for other laid-off workers to get hired back at similar types of companies that laid them off. When the economy turns around, they will be slow to hire back to their previous levels.

"Maybe the smaller and newer companies will hire more quickly," he postulated.

With an "excellent" prognosis after being unemployed for six weeks, engineer Dale Stearns of Wellesley Hills, Mass., considers it "just a matter of time" before he finds a new job.

Stearns was laid off from his job as electronics project leader at the International Equipment Corp. Division of Damon Corp. in Needham Heights, Mass., after 4½ years. While Damon's outplacement services were "excellent" and are still available to him, Stearns feels this is a "tough time of year" to be looking for a job.

"The combination of funding concerns and the holidays is causing many companies to sit on things instead of making decisions," he observed. Predicting a "tremendous upsurge after the new year" in the Northeast, Stearns recommended that anyone out of work should not "lose heart and should keep pounding — that's the key to the quickest way to success.

"People can't sit back and stop looking," he added. "They're hot to trot the first few days, but then they feel they can't do it and just sit back and depend on agencies.

"You have to pursue all avenues. Use agencies, answer ads you're interested in, make use of contacts you did business with while you worked for a company, go out to places you'd like to investigate," he recommended. "In the past, I've gotten work just walking in blind to places when there was seemingly no work around." ■

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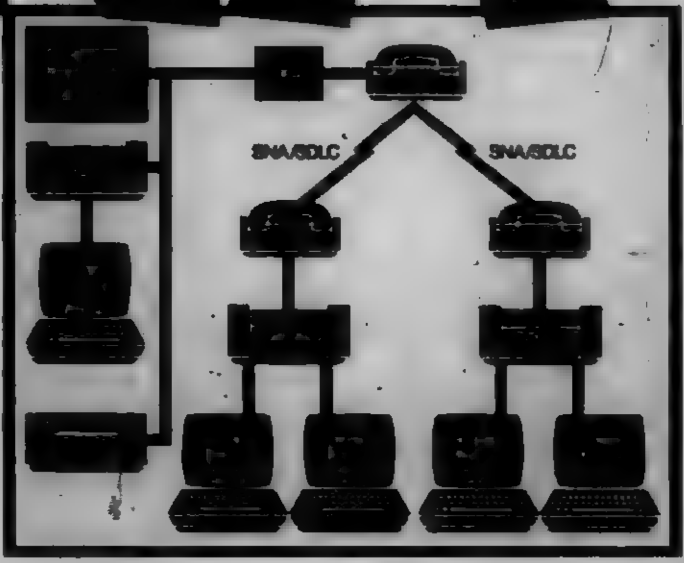

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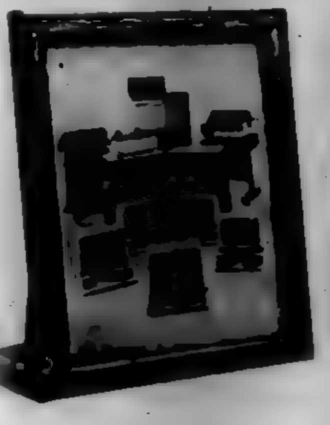

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*Chart based on trade press articles, Wang literature, industry reporting publications, and data supplied by industry reporting services.

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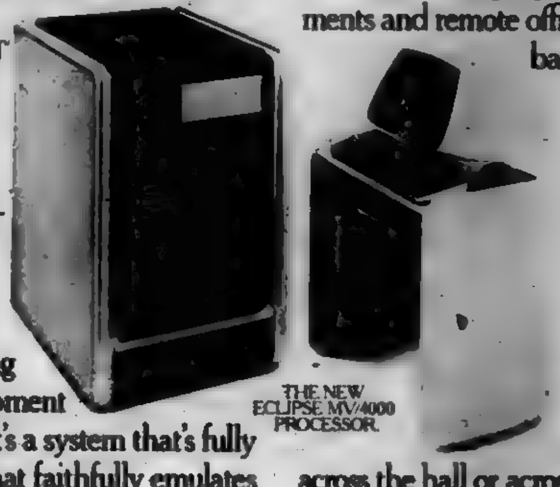

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What Happens to Vendor Rejects?
Page 52

Computer Industry Layoffs Widespread, Varied

Just how many layoffs have there been in the computer industry this year? U.S. Department of Labor statistics show a jump in electronics unemployment from 7.1% in May to 13.1% in November. A survey of some of the larger computer vendors produced the following laundry list:

- **Burroughs Corp.** at year-end 1982 has 63,000 employees worldwide vs. 67,000 on Jan. 1, 1982. Burroughs' cutbacks were complicated by the firm's acquisition of Memorex Corp. and the subsequent phasing out of duplicate facilities and an overall reorganization of the corporation. Terminations were across-the-board, with the majority being assembly and hourly wage workers.

Total: 4,000.

- **Datapoint Corp.** on March 26 terminated 230 people, both administrative and clerical, in its domestic operations group, stemming from the relocation of the Waco, Texas, plant to Fort Worth, Texas. At the same time, there was some hiring in Fort Worth to fill the gaps caused by employees not willing to relocate. April 7 brought the reduction of the firm's domestic field marketing force by 250 people.

Total: 480.

- **Honeywell, Inc.** laid off 1,150 employees last January — about 700 in the U.S. Marketing and Service Group (USMSG) and 450 in the Small Systems and Terminals Division (SSTD). Two-thirds of the layoffs were in Massachusetts. USMSG cuts were in product planning and marketing support positions. SSTD cuts were in direct manufacturing (250), indirect manufacturing (100) and engineering and planning support (100).

On Dec. 2, another 1,750 workers in the Information Systems Division were cut — 700 in Massachusetts, 450 in Phoenix (125 in production), 115 in Minneapolis, 485 in field support and international operations. In Massachusetts, 280 were in SSTD and the rest in USMSG.

Total: 2,900.

- **National Semiconductor Corp.**, on Aug. 6, laid off 1,000 largely production workers "to bring capacity back in line with demand," a spokesman said.

Total: 1,000.

- **Sperry Univac's** U.S. population is down 4% to 32,500 from 34,000 a year ago. The Santa Clara, Calif., disk-drive plant has been reduced from 1,900 to 1,800 workers; Bristol, Tenn., has dropped from 2,000 to 1,500 workers; and the Irvine, Calif., minicomputer plant was transferred to Salt Lake City, Utah, for a drop from 1,000 to 150 in Irvine. Most cuts were of assembly and hourly wage earners; 1% of the professional work force was laid off.

Total: 1,500.

- **Storage Technology Corp.** laid off 400 nonmanufacturing personnel in November, its first mass layoff since the firm's founding 13 years ago. Categories included engineering, finance and administration. A few workers have been called back already.

Total: 400.

- **Texas Instruments, Inc.** laid off 2,700 people on March 17, 850 on April 30, 300 on May 28 and 2,600 on Sept. 27. No breakdown is available of worker types.

Total: 6,450.

Grand Total in 1982 for Seven Companies: 16,730.

Storage Technology was the only company that indicated it did not offer outplacement services. Most attempted to help those laid off by furnishing resume writing help, the use of typewriters, free long-distance telephone lines, job listings at area companies, interviewing technique counseling, advice in applying for unemployment benefits and, in some cases, informational pamphlets aimed at the job-seeker.

The question now is whether the New Year's expected upturn will result in jobs for those laid off this year. Some have their doubts.

One employment expert even suggested that "a lot of this is contrived.

"Companies are taking advantage of the economic situation to get rid of people they didn't want to hire in the first place," according to Ron Armstrong of Armstrong & Associates in Houston. "It's a good excuse

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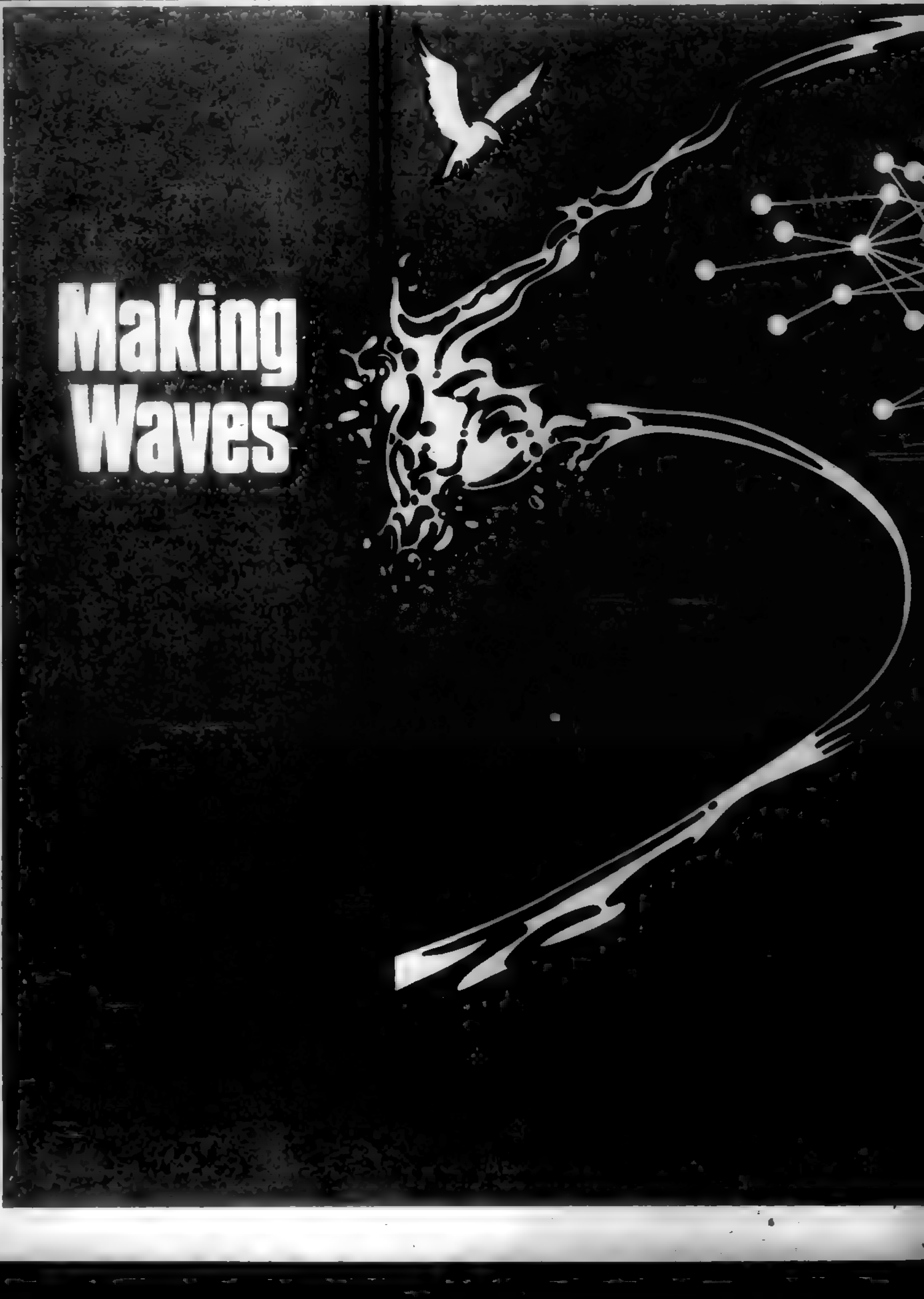


What Happens to Vendor Rejects?
Page 53

As Electronics Unemployment Jumps to 13.1%

to get rid of blacks, females and men and women over 40 — the minorities they had to hire — and not have to answer to the government for it."

"People usually are not laid off without just cause," according to JoAnne Rudolph, account executive with the CompuSearch Agency recruitment firm in San Francisco. "Generally speaking, those laid off are deadwood or incompetent."

That depends on your definition of "deadwood," according to Joe Quirk, office manager at Perry White & Associates, Inc., a DP employment firm in Waltham, Mass. "At one company, 'deadwood' can mean nonproductive, not keeping up with management's criteria, but in another company it can just mean anyone who is not involved in the manufacturing end," he said.

In many cases, "those who are really good are not part of the layoff picture," observed one Boston-based employment counselor, "but if there's no choice at a company, the good go with the bad, in which case the good people will have no trouble finding a suitable position very quickly." ■

DP Job Agencies Getting Positive Vibes

The unemployed are not the only ones who see an upswing in hiring after the first of the new year. DP-oriented personnel agencies around the country are getting the word from client companies that new hires are coming soon.

The outlook for 1983 is "Fantastic. We definitely have high hopes in terms of employment," remarked Joe Quirk, office manager at Perry White & Associates, Inc. in Waltham, Mass.

"We bottomed out 2½ months ago" in terms of job listings, Quirk said. "Since then there has been a gradual increase in the number of positions at high-tech firms, and we see it getting better."

People being laid off now from high-tech firms "will definitely be absorbed before next year's new graduates find positions," Quirk forecast, noting that "the fresh graduates have the hardest time finding positions."

There will be more hiring in the San Francisco area as well, according to JoAnne Rudolph, account executive with Compusearch Agency, a recruitment firm. "That's what my employers tell me."

While agreeing that the new year is expected to bring a turnaround in the employment picture, Ron Armstrong of Armstrong & Associates in Houston tempered his enthusiasm: "I really don't think it will ever get back to the frantic running around there used to be."

Meanwhile, despite the predicted upturn, some placement firms in Boston, Houston, Dallas, San Francisco and undoubtedly elsewhere are themselves bottoming out — cutting back personnel or going out of business completely. The job orders to keep them going just do not exist.

In Dallas, about 150 smaller employment shops (with two to six counselors) have closed since the beginning of the year, according to an unemployed project manager who calls it "the worst conditions here in seven years." In the San Francisco Bay Area, a number of DP placement shops are cutting or closing, according to Rudolph. The local branch of Perry White has shrunk from 25 counselors last year to six this year.

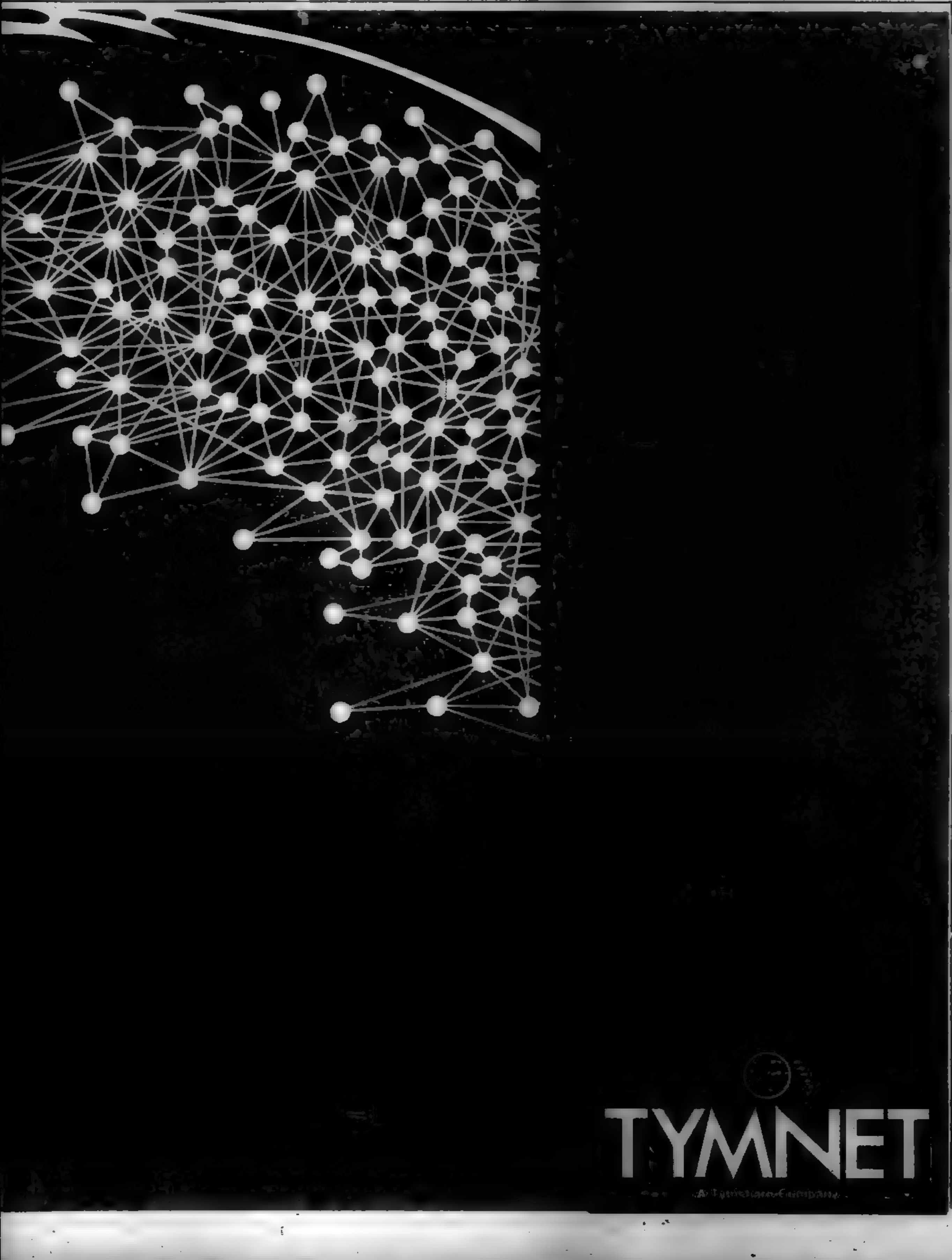
"It's a sheer miracle I'm still going," said Armstrong in Houston, "and I'm going only because I've diversified into other things."

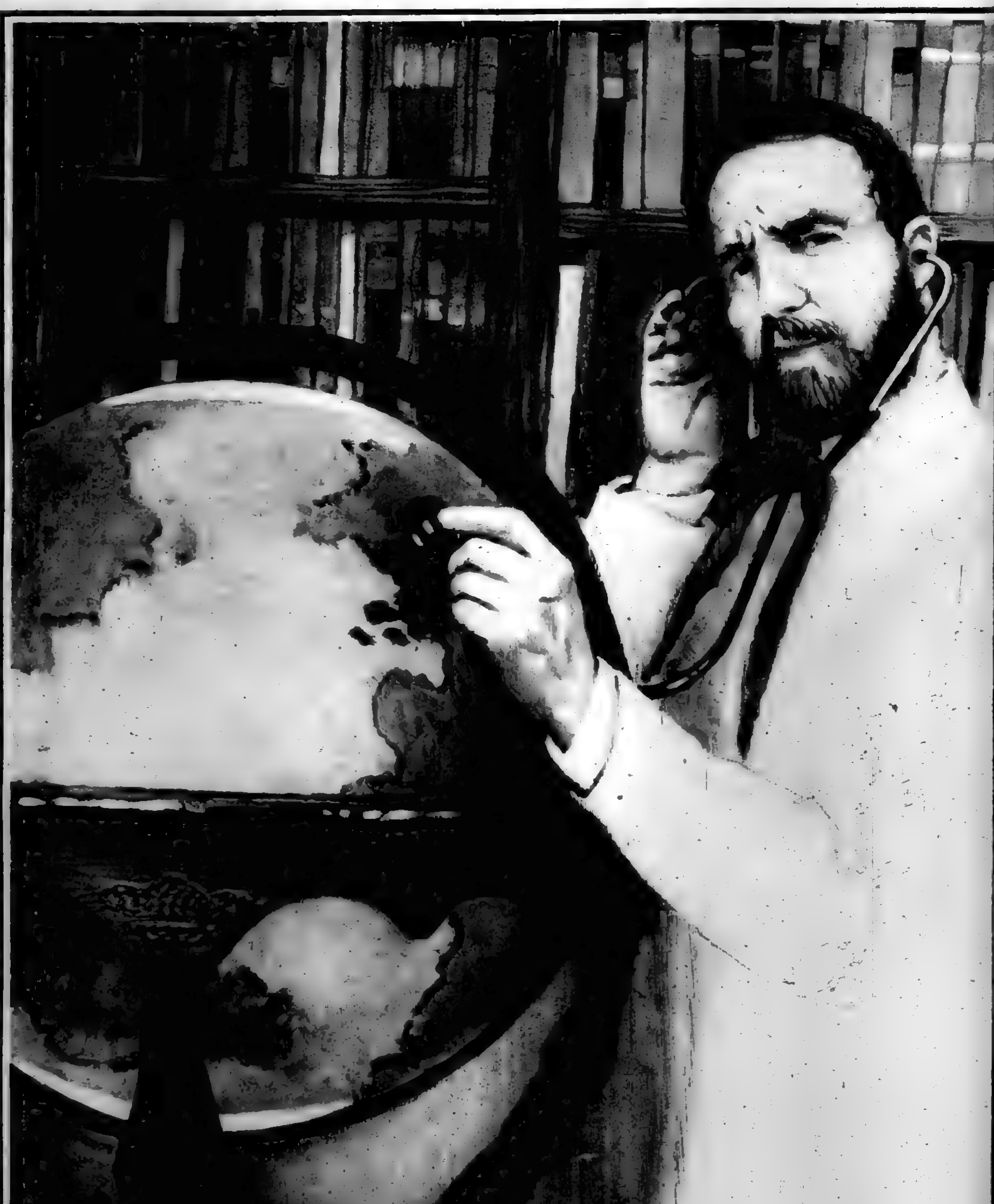
Armstrong pointed out that "what used to be the biggest DP employment agency in the Houston area having up to 17 counselors is now down to the owner and two counselors." That firm has 25 real job orders vs. 500 to 1,000 last year, he said.

"Fifteen minutes ago, I spoke with an agency owner who has exactly one job order," he added.

With about 2,500 job applicants in his own files, Armstrong presently is working with two DP job orders. The jobs are for "heavy technical support types," he said, adding that systems analysts can "forget it."

Prospective employers can afford to be very discriminating when hiring, Armstrong observed. "It's worse now than it was back in 1970," he said. Job seekers "can't even get an interview now . . . There's been a complete turnaround from the days when you could get a job with 60% of the qualifications sought." ■





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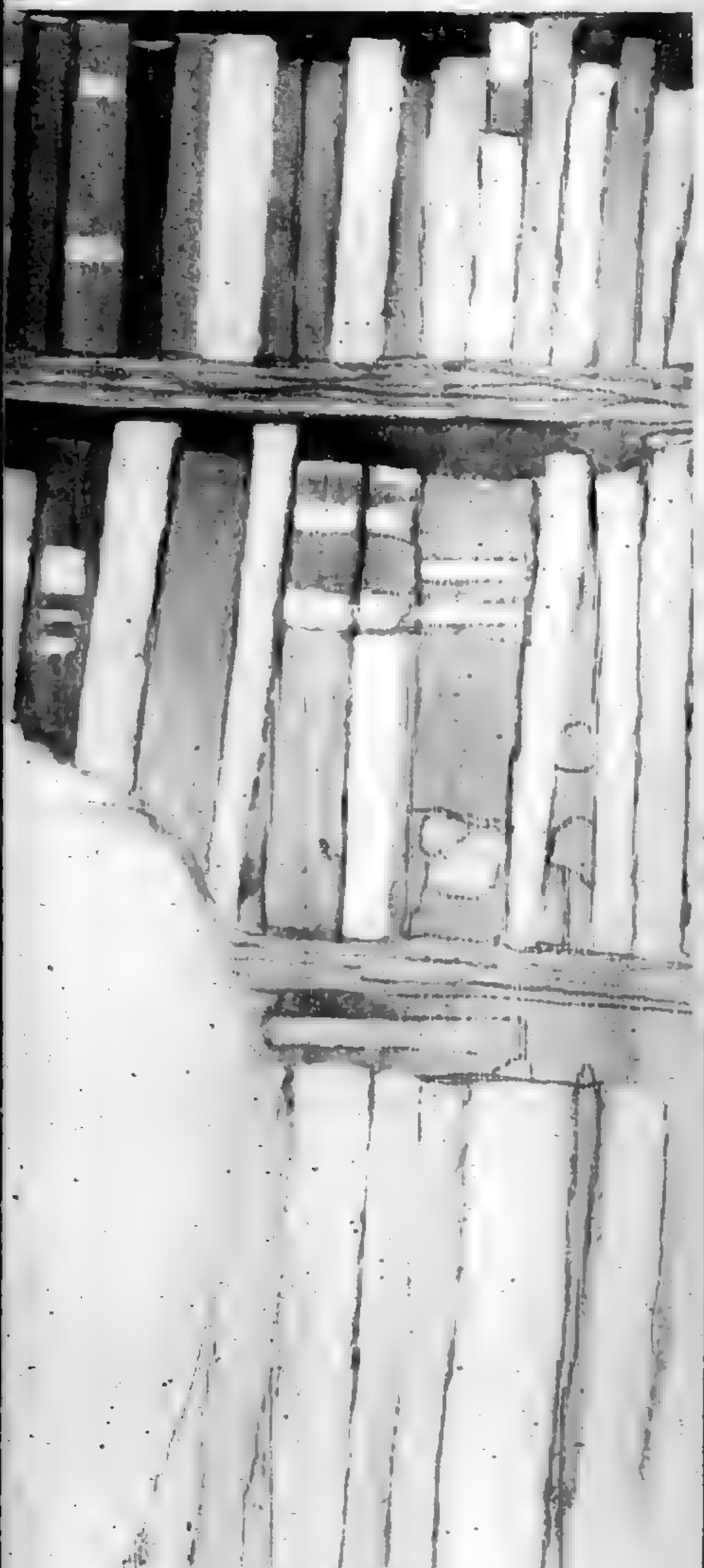


Forecast '83

The Worldwide Computer Market

Is Recovery On the Way?

By Bill Laberis

The cover of *Business Week* last May 10 was bright red. It featured both the smiling face of Ronald Reagan and a headline trumpeting, "Here Comes the Recovery."

Seven months later, the U.S. — and indeed the world — is still waiting for that recovery. Economic prognosticators have adjusted their rose-colored glasses and now find themselves staring at a coming year filled at best with uncertainty and anemic recovery.

Capital spending, the grist of economic growth, was flat this year and is widely expected to plummet in 1983. Consumer confidence, without which a recovery cannot happen, grows dimmer with each new report of rising unemployment, both here and abroad. These are the days that give new meaning to the definition of economics as "the dismal science."

To date, the computer industry has weathered the recession perhaps better than any other discrete sector of the world economy. Only the semiconductor manufacturers, which have laid off thousands of workers, have felt the across-the-board impact of the prolonged economic slide that has ravaged the steel and auto industries.

But cracks in computer industry performance began to show in 1982. If IBM's profit and revenue performance is omitted, the computer industry as a whole displayed the strain of the recession. In the first nine months of 1982, Amdahl Corp.'s profits were down 81%; Control Data Corp.'s, 32%; Sperry Univac's, 72%; and Data General Corp.'s, 51%.

And if the shipment gains of IBM's 3080 line of mainframes are omitted from the overall scorecard, growth in the general-purpose computer market was relatively flat this past year. Only IBM and the makers of personal computers emerged as recession-resistant operators.

Although worldwide real economic growth on the order of about 2% is predicted for 1983 — less than half the growth of a healthy recovery period — much of that growth is expected to come in the areas of housing construction and stepped-up defense spending both here and abroad. It is questionable whether this kind of increased spending will do much to affect gains in sales of computer equipment, many observers feel.

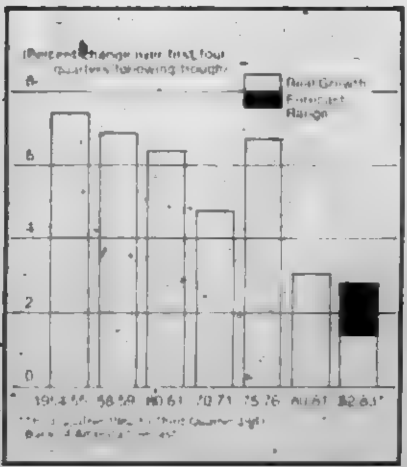
"Information processing and office automation are cost-saving necessities, which is why these areas have grown during most of the recession," commented economist Otto Eckstein of Data Resources, Inc.

More Trouble Ahead?

Efficiency and productivity drives will continue to buoy the industry in 1983, Eckstein predicted, but a downturn in overall capital spending could wreak further havoc on industry profits.

(Continued on Page 57)

Bill Laberis is Computerworld *senior editor/computer industry.*



Bank of America Chart

Average Growth in Real GNP During Recovery Periods

U.S. Computer Mart Growth Forecast

Meaningful recovery from the worldwide recession will occur only if there is a prolonged recovery in the U.S., according to analysts recently interviewed. And domestic recovery will result from a burst of consumer confidence, government-induced lower interest rates and a surge in capital spending.

This quick-fix potion must be somehow blended despite "the most grotesque economic policy we've seen in decades," said Harvard University economist Otto Eckstein, referring to President Ronald Reagan's economic recovery plan.

"We are the center of the world economy, no doubt about it," Eckstein said. "Our policies, for better or worse, call the tune for the whole world."

Worldwide economic uncertainty notwithstanding, a continued demand in 1983 for more computing horsepower, the proliferation of microprocessor-based small systems and new products will ensure continued growth for the U.S. computer industry, although price competition in a market characterized by limited demand will squeeze profits once again, analysts feel.

According to International Data Corp. (IDC), strong shipments of IBM 30 series processors gave IBM a solid financial performance in 1982, compared with its competitors. Other mainframers — Amdahl Corp., for example — have experienced difficulties in part because they have yet to begin shipping new high-end machines. But even if 1983 proves to be a sluggish recovery period, this situation should change for the plug-compatible manufacturers (PCM).

"IBM is in the happy moment of its product cycle this year," Eckstein said. "The PCMs should catch up in 1983, depending, of course, on what happens in the economy."

With few exceptions (Honeywell, Inc. being the most notable), the industry in 1982 managed to sidestep the wholesale layoffs that wracked other segments of the economy. Instead, the computer industry fought the recession with a combination of work force reductions caused by attrition, hiring freezes, wage freezes and some wage cuts. Analysts interviewed said that even a modest recovery would allow domestic manufacturers to maintain current work forces throughout 1983 without jeopardizing the research and development efforts needed to produce a new electronic cash crop.

Traditional Bellwether

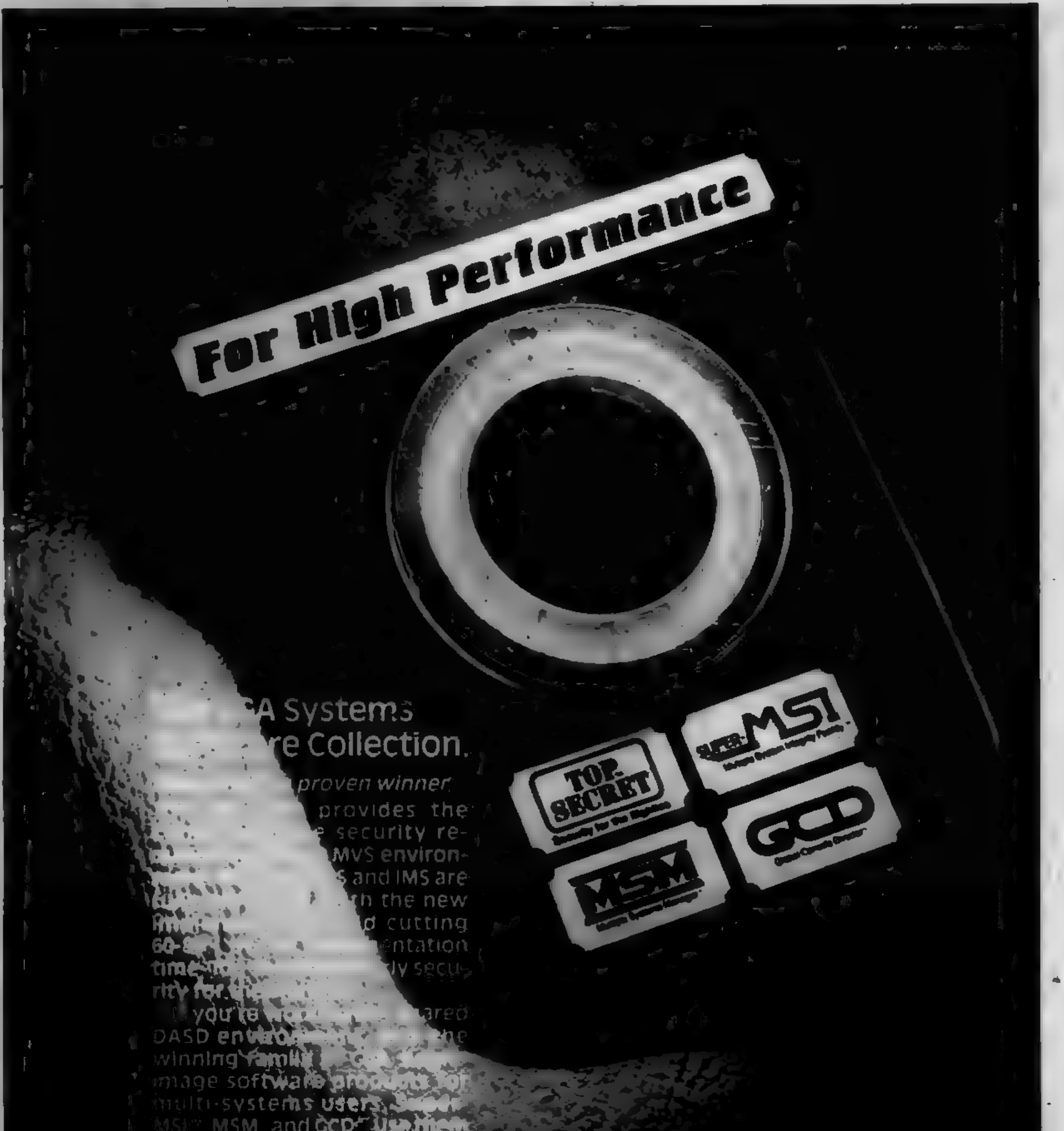
But a traditional bellwether for the computer industry, the U.S. semiconductor industry, is in much tougher shape, operating at roughly 75% of capacity, according to the Semiconductor Industry Association (SIA). Texas Instruments, Inc. alone has laid off more than 12,000 workers during the recession.

Nevertheless, SIA is predicting growth of 18% in 1983. IDC has noted that full recovery in the semiconductor segment of the industry will not occur until computer shipments pick up, as computer companies are the largest users of semiconductors.

Certainly one of the biggest unknowns in 1983 will be the course the federal government will chart to bring some stability to what has been a deteriorating situation. Cries for protection of U.S. industries against foreign competition, the Japanese in particular, have become louder as unemployment has soared into double-digit figures.

"We need some drastic moves on this front, but we'll probably make the wrong moves, protecting steel and autos and textiles," Eckstein said. "We should protect our strengths," he said, alluding to the information processing industry, "not our weaknesses."

"The best thing the [U.S.] government can do for industry next year is bring down interest rates so cost of capital is in line with what it is in Japan," remarked Larry Chimerine, chairman of Chase Econometrics. Chimerine also said the government should work "to bring down the value of the U.S. dollar on foreign exchange markets," which would fatten the profit statements of U.S. computer firms selling abroad. ■



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Japan Watching IBM's Moves

"To understand what the Japanese computer manufacturers propose doing in the marketplace, one must recognize that the Japanese are mesmerized by IBM — what it stands for, does or is likely to do," wrote computer market analyst Ulric Weil in his recently published *Information Systems in the '80s.*

In 1983, this will mean matching IBM dollar for dollar, product for product, Weil observed in a recent interview.

"Japan, Inc. is railing against America Corp., which the Japanese see clearly as IBM," another analyst remarked. "Recession or not, they'll be every bit as aggressive in 1983 as they've been in the past. In fact, with a general slowing of world demand, they're apt to become even more feisty."

Indeed, the Japanese industrial juggernaut is slowing, its economic fabric showing distinct signs of wear. Although the Japanese economy remains the premier performer among all industrial nations, "Japan's luck is beginning to run out because they can no longer export their troubles due to the downturn in world trade," a third analyst observed.

Japan watchers are looking for real growth of between 2.5% and 3.5% in 1983, a far cry from the boom times of recent years when uninflated growth of 5% and more was the rule.

Mounting World Pressure

Equally important as Japan's posture in the face of the recession will be the way the country reacts to mounting world pressure to tear down the allegedly protectionist barriers that have helped its industries flourish over the past two decades. The Japanese exist within a closed society, economist Otto Eckstein said, and will do little to tear down protectionist barriers in 1983.

But the pressure to do so is intensifying. In a recent report, the White House U.S. Trade Representative Office blasted the Japanese government for failing to act expeditiously in removing high-technology trade barriers.

Even if Japan does tear down a portion of its alleged trade barriers in 1983, which some believe is happening in nongovernment sectors, "there is some question whether the Japanese people will be willing to buy from another country," Weil speculated.

Meanwhile, analysts predict Japanese computer companies will continue to forge alliances, trading partnerships and other joint ventures with American firms, using the leverage provided by readily available equity capital to exploit homegrown talent and innovation. All the major Japanese mainframe vendors have interests in U.S. firms manufacturing IBM plug-compatible mainframes — Fujitsu Ltd. in Amdahl Corp., Hitachi Ltd. in National Advanced Systems, Inc. and Mitsubishi Industries in IPL Systems, Inc. ■

(Continued from Page 55)

Commenting on the effects of overall industrial sluggishness on the computer industry, Eckstein said, "I wouldn't want to be a computer salesman in Detroit in 1983." Also, he sees no evidence that the recession has bottomed out.

According to Eckstein's analysis, the root of current economic problems is that the world economy is shrinking. The volume of world trade in 1983 could be down as much as $150 billion compared with three years ago, causing "severe structural unemployment, financial distortions of alarming magnitude and strained business relationships," according to *Moody's Bond Survey*.

As of this writing, more than 30 million workers in Western industrialized countries are unemployed, their numbers inexorably increasing.

One effect of the deteriorated world trade situation, and the fact

(Continued on Page 58)

	History			Forecast	
	1980	1981	1982	1983	1984
Canada*	0.1	3.1	-4.9	2.5	3.9
France**	1.1	0.6	1.6	1.0	2.0
Italy**	3.9	-0.2	0.6	1.4	4.5
Japan*	4.2	3.0	2.7	3.4	4.2
United Kingdom**	-1.5	-2.0	0.9	2.1	2.6
West Germany**	2.0	-0.1	-0.6	0.6	3.0
United States*	-0.4	1.9	-1.7	2.2	4.4

*Gross National Product.
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(Continued from Page 57)

that the U.S. is relatively better off than many of its economic allies, has been a particularly strong U.S. dollar on world markets — artificially strong, some analysts say. For U.S. computer companies, some of which do 40% or more of their business abroad, the result has been devastating. Because the U.S. economy may well perform better than those of its trading partners in 1983, computer manufacturers may be staring at a continuation of that situation.

Morgan Stanley computer industry analyst Ulric Weil is looking for "a somewhat delayed recovery in 1983 and slower growth thereafter." He added, "We've scaled down our hopes for the vigor of the recovery."

Like Eckstein, Weil said that capital spending "shows no signs of coming to life," claiming this situation is "intimately linked to the computer industry, where capital spending is a key variable." Weil predicted that the downturn in capital spending could be particularly debilitating to the minicomputer manufacturers specializing in industrial, scientific and computer-aided design/manufacturing applications.

While the major vendors "have the financial stamina to withstand another flat year," Weil said "they may not like the financial results in 1983."

OEM inventories, like those of the entire manufacturing sector, are at "the lowest tolerable levels," Weil added. The need to replenish these inventories, along with an upturn in consumer confidence, will spearhead a modest U.S. recovery, which he said will spread "painfully slowly" to Europe and the rest of the world.

By most measures, 1982 was the single worst year for the world economy since the Great Depression. Next year will be better, but only slightly. As one analyst put it, "If the recovery is sustained at all in 1983, it will do so only with a lot of luck." ■

'Mixed Bag' Expected in Europe

A mixed bag of recovery, recession and stagnation is expected next year in Europe, with growth generally lagging behind Japan and the U.S.

For European computer companies, this situation could produce the same market flatness that plagued many of them in 1982. Anticipating such market conditions on the continent, Britain's International Computers Ltd. (ICL) will vigorously target the U.S. market in 1983 and beyond, company officials have indicated. ICL's Model 21 Retail Controller will spearhead the company's renewed drive on the U.S. market, according to International Data Corp.'s "Europa Report."

ICL saw its profit picture move into the black in fiscal 1982: It earned nearly $26 million after losing $90 million in 1981. The turnaround followed two years of aggressive cost cutting and plant closings. In 1983, the company is likely to begin forging joint deals and collaborative agreements with U.S. and Japanese companies.

Analysts and economists believe that 1983 will be a relatively good year for both Britain and Italy, which have been hammered by recessionary blows in the past several years. While observers concede that the 1% to 2% real growth likely in those countries is hardly earth-shattering, it would indicate that the recession has indeed bottomed out in those two nations, both of which are currently plagued with excess industrial capacity.

In France, on the other hand, the recession may be just picking up steam, economists say. If this is the case, 1983 may well see a slowing in the French government's effort to expand videotext and teletext services.

Highest Unemployment Levels

West Germany, the economic pillar of postwar Europe, is experiencing its highest unemployment levels in industrial centers since the '30s. Economic woes there were bad enough to topple the centrist regime of Helmut Schmidt, and mass demonstrations by unemployed workers have become common in several cities.

Economists feel that the West Germans are having an increasingly difficult time funding their broad range of social services during a prolonged economic downturn, and laid-off workers are determined to fight service cuts. Thus, real growth in West Germany next year will likely be from zero to about 1%.

A recent study conducted by European telephone organizations predicted that Sweden will become the most terminal-dense nation in Europe by 1986, with the number of installed terminals exceeding 30 per 1,000 employees. Meanwhile, 1983 will see a continuation of rapid and sustained growth in software sales in Sweden, supplied greatly by U.S. vendors, the report said. ■

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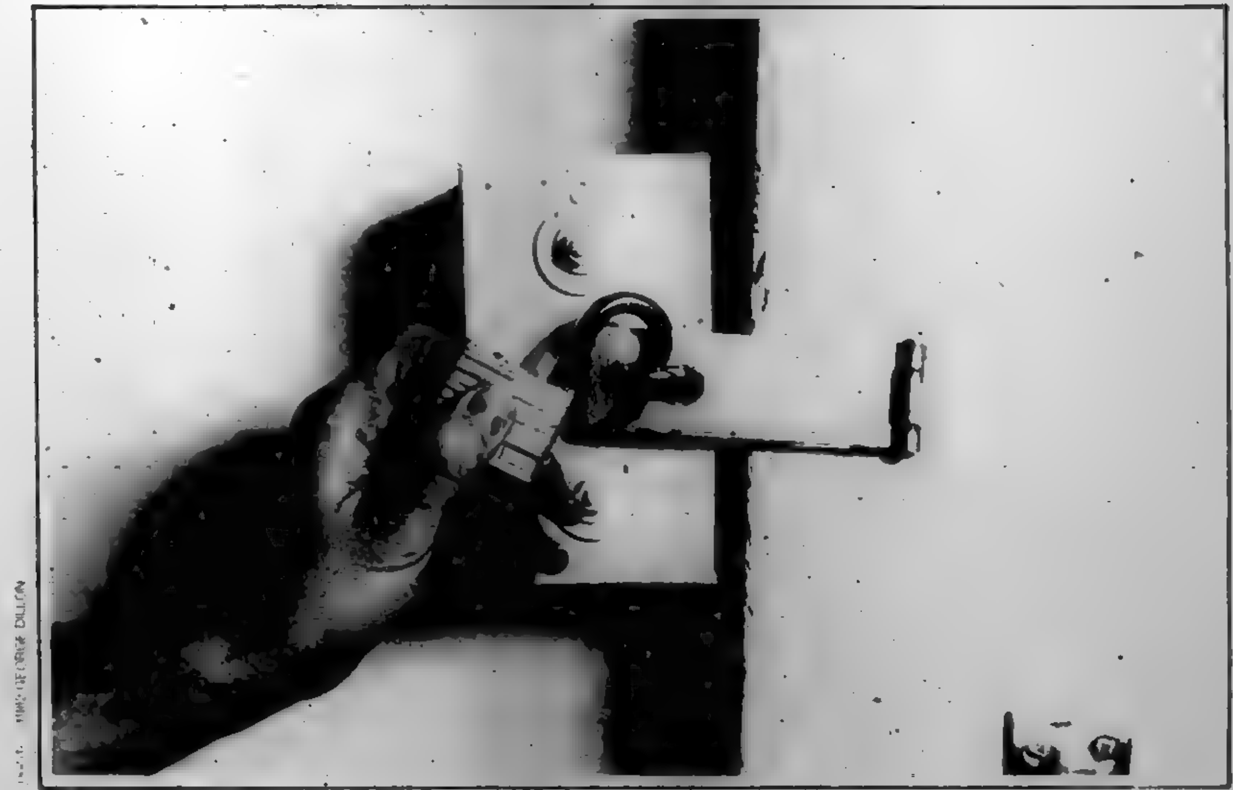

Free Trade vs. Protectionism

Selling High Technology

By Jake Kirchner

The persistently stagnant economies afflicting most of the world's industrial nations have created a crisis in the trade relations between the U.S. and its major trading partners, all of whom are counting on increased exports to create jobs, provide much-needed capital and, in general, bring relief from their fiscal despair.

Despite the best efforts of committed free traders in America, Europe and Japan, there now seems to be little hope of avoiding the escalation of protectionist sentiment at home and abroad into a trade war of major proportions. The resulting conflict promises to have major negative implications for American providers and users of data processing and telecommunications.

The long-hoped-for international economic upturn, now expected sometime in 1983, could ameliorate the global trading frictions. However, most observers expect things to get worse before they get better. The situation has prompted no end of international finger pointing and scapegoating, but there is also no lack of consensus about the true culprits in this diplomatic maelstrom: record-breaking unemployment, disastrously high interest rates, unstable and unrealistic currency exchange rates and the naggingly flat economic growth in most developed nations.

"The great risk of economic stagnation is that domestic unemployment and financial difficulties may lead to trade protectionism as an expedient method of protecting domestic jobs and shielding local companies from import competition," Sidney L. Jones, resident scholar at the Washington, D.C., American Enterprise Institute and director of the institute's current international trade project, wrote in a recent paper on trade policy issues. "Protectionism is always a potential risk, but the explicit pressure to 'do something' becomes much more intense during periods of economic stagnation."

In the U.S., the pressure on Congress and the Reagan administration "to do something" has risen steadily during the last few years as American farmers found it increasingly difficult to compete for overseas markets against the heavily subsidized agricultural exports of the European Community, and as U.S. industries were buffeted by competition from low-priced steel, automobiles and semiconductors from abroad. Our allies, in turn, cite the U.S. for its quotas on cars, steel and textiles, as well as our subsidies of sugar and dairy products.

Most protectionist activities are defended as temporary, needed only until the economic situation improves enough once more to make free trade financially and politically acceptable. But with the lingering economic malaise, rapidly growing trade restrictions threaten a serious breakdown of the international trading system.

With this in mind, the Reagan administration decided almost two years ago to seek a high-level meeting of the 88 signatories of the General Agreement on Tariffs and Trade (Gatt), the loose organization whose treaties have formed the trading "rules" for most of the world during the past 34 years. The resulting ministerial meeting of the Gatt was held in Geneva, Switzerland, in late Novem-

(Continued on Page 60)

Jake Kirchner is a Computerworld *correspondent based in Washington, D.C.*

(Continued from Page 59)

ber, the first such high-level gathering in eight years.

Ambassador William E. Brock, U.S. trade representative, led a 42-member U.S. delegation seeking a commitment of the 88 members to halt protectionism and work toward relaxation of trade barriers. In addition, the U.S. wanted the Gatt organization, which covers trade in goods, to begin looking at the feasibility of including in the Gatt structure issues of high-technology trade and trade in services, such as data processing, insurance and banking.

Depending on whose account of the acrimonious five-day meeting you hear, it was either held at the completely wrong time or just in the nick of time to save the Gatt compact. The national delegations to Geneva argued long and hard, and the pressure on the delegations to defend their countries' trade policies nearly wrecked the undertaking. Brock and his fellow Americans argued that the economic situation is precisely the reason the Gatt countries must recommit themselves to free trade, before a global trade war becomes inevitable.

'Seriously Endangered'

In the end, the Gatt members signed a 17-page communique stating their recognition that "the multilateral trading system . . . is seriously endangered." The document continued: "Conscious of the role of the Gatt system in furthering economic wellbeing and an unprecedented expansion of world trade and convinced of the lasting validity of the basic principles and objectives of the general agreement in a world of increasing economic interdependence, the contracting parties are resolved to overcome these threats to the system."

If the communique was something less than an ambitious action plan for free trade, it was a rousing endorsement of openness principles when compared with the lack of success the U.S. had in promoting services and high-technology issues in Geneva. The American proposal for a work program in high techology was scuttled by opponents to the U.S. approach.

In services, the work program approved was less than exciting. The most to which the Gatt members would agree was to consider discussing services-related topics among themselves in preparation for taking up the subject at a planned 1984 Gatt meeting.

Brock pointed to the "very fuzzy" wording on services in the communique and said, "I'm not very happy with the words we got, but at least we'll continue to draw attention to this problem over the next two years."

Commenting on the meeting's results later in Washington, Brock noted the near failure of the discussions and said it "could have been a disaster. The avoidance of tragedy and at least a limited movement in the right direction is really a healthy sign." The proof will be in how the limited Geneva agreement is implemented by the signatory governments.

It is noteworthy that the European Community immediately voiced its reservations about the communique and emphasized its right to interpret it as seems best for its interests. At home, the Reagan administration acknowledged that the communique is likely to have little effect on the protectionism sentiment rising in Congress. But, Brock said, the document at least

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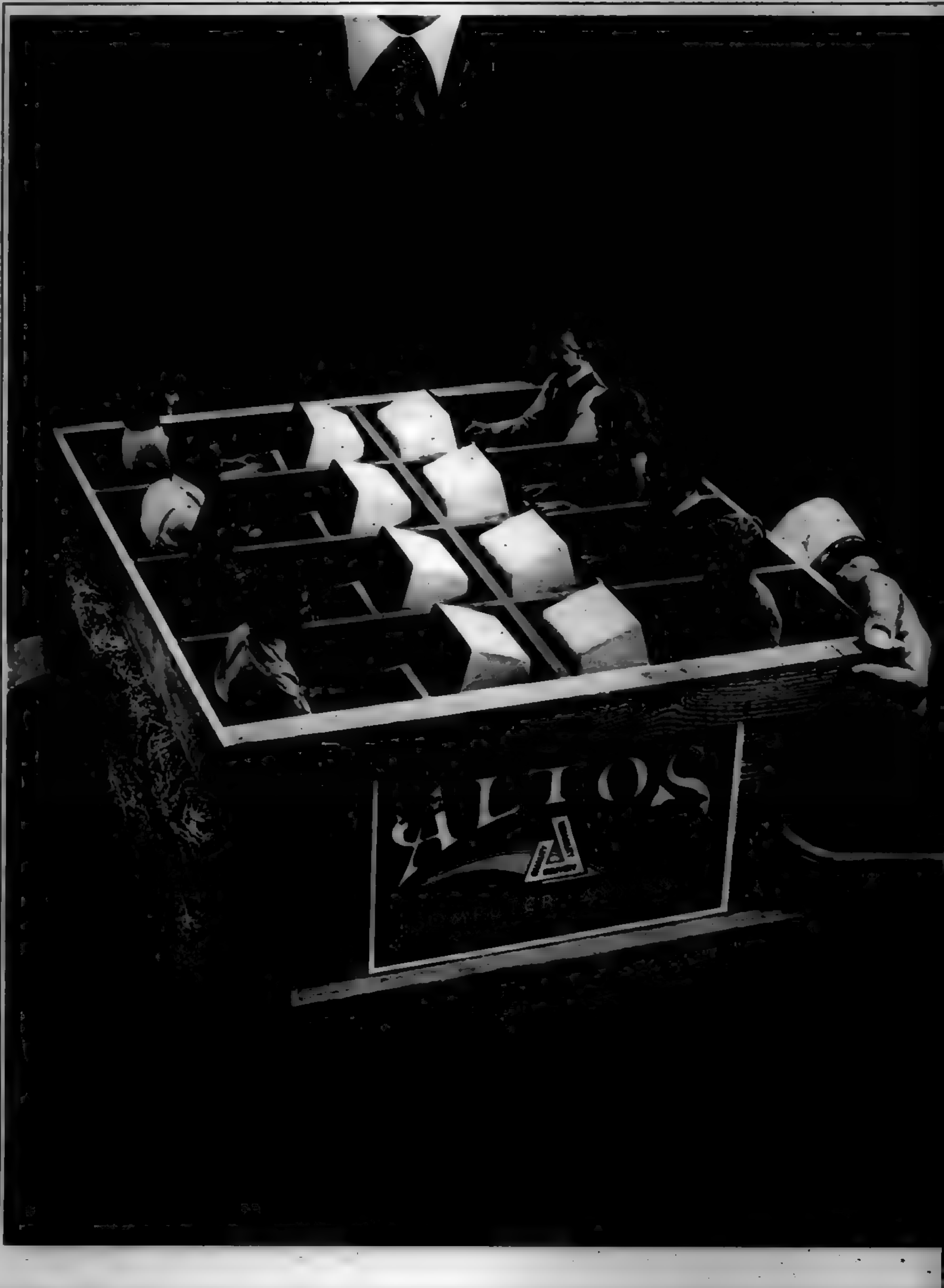

gives the administration some ammunition against protectionism here in that it can be waved when arguing before Congress that "if you act like idiots [and give in to protectionism], we're going to pay."

Brock acknowledged the hard fight the administration faces with Congress. Indeed, the battle was joined in earnest immediately following the Geneva meeting. Senate Finance Committee Chairman Robert Dole (R-Kan.), also a delegate to the Gatt meeting, commented that "the climate is now right for protectionist measures in Congress . . . I hope we don't get in a big trade war, but we'll be under a lot of pressure to teach somebody a lesson or show that we mean business."

Sen. Charles E. Grassley (R-Iowa), another Gatt delegate and member of the Senate Finance Committee's International Trade Subcommittee, put it even more forcefully, telling his colleagues that it is "apparent to me that Gatt either cannot or will not handle the difficult and complex areas of nontariff barriers, export subsidies, import licensing, trade in services, investment and high technology . . . The time has come," he said, "to let our trading partners know that we are no longer willing to tolerate one-way streets."

Sen. James J. Exon (D-Neb.), a member of another Senate trade subcommittee, called the Gatt meeting "a disaster," the communique "a sham." Exon stated, "We have been taken for a 'trade ride' far too long, and Uncle Sam can no longer afford to play Santa Claus."

The reaction was no milder in the House of Representatives, where Joesph M. Gaydos (D-Pa.) berated what he called Japan's "samurai" trade tactics and declared that "our patience is not without limit." Similarly, Rep. Toby Roth (R-Wis.), a member of the House Foreign Affairs Committee, said, "We have to show that we have some muscle . . . I think it is about time we send a signal and tell the rest of the world that we will not be taken advantage of in trade policies."

In Washington, then, the political climate is ripe for protectionist legislation. This has been increasingly true for the past several years, but trade topics took on a new urgency for national politicians during the recent elections, when senators and congressmen heard over and over from their constituents that the number one problem is unemployment. If we can't add jobs through trade, we can at least stop the erosion of employment caused by foreign imports, the argument goes.

Many lawmakers, including such influential members as Sen. Edward Kennedy and Speaker of the House Thomas P. O'Neill, returned to work during the lame-duck congressional session committed to pushing a domestic content bill that would require all cars sold in this country to have as much as 90% of their parts American-made. This bill, with overwhelming support in the House, may be stalled in the Senate and faces a presidential veto if eventually passed.

Clearly Worried

However, the administration and trade groups espousing free trade are clearly worried about its implications and the precedent it might set. If Congress is willing to protect U.S. auto makers, the reasoning goes, where will it all end — with steel, textiles, agricultural goods, computers?

"We can all stand up and make speeches about fair trade, free trade, protectionism — whatever it might be, but we all live in the real world," Dole said about the political pressure to do something about the trade imbalance. "There's a great deal of concern all across the country about how we're going to find jobs. The bottom line is there's a lot of politics in this — not partisan politics, but survival politics. Most people like being members of Congress."

In general, then, trade now has an enticing political

(Continued on Page 62)

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(Continued from Page 61)

cachet. This was never more evident than during the recent campaign when Democratic presidential hopeful Walter Mondale elicited tremendous enthusiasm as he stumped the country inveighing against Japanese imports. While Mondale's speeches can be dismissed as tub-thumping campaign rhetoric, a more subtle transformation is occurring within the Democratic party as a whole, led by a group known popularly as the "Atari Democrats."

The Atari Democrats — young politicians typified by presidential candidate Sen. Gary Hart (D-Colo.) and House Telecommunications Subcommittee Chairman Timothy Wirth (D-Colo.) — espouse a philosophy that says the aging "smokestack" industries need to be protected but that the nation's real emphasis should be on electronics and other high-technology industries, which they see as America's future job providers and income producers. These economic sectors have been targeted in some of the nearly two dozen reciprocal trade bills now before Congress, which would set import strategies based on U.S. access to foreign markets.

"What seems to be emerging from the younger Democrats . . . the neo-liberals, or so-called Atari Democrats . . . is the recognition that the ground rules have changed, and we have to look out the front window rather than through the rearview mirror, and we cannot apply the policies of yesterday to the problems of tomorrow and that . . . whether or not those policies were good in the past, they're no longer complete," noted Washington, D.C., consultant Arthur Bushkin, a former high-ranking official of the National Telecommunications and Information Administration.

According to Bushkin, now president of the Washington, D.C.-based Telemation Associates Inc., "We've got to look at investment in the knowledge industries. If

(Continued on Page 66)

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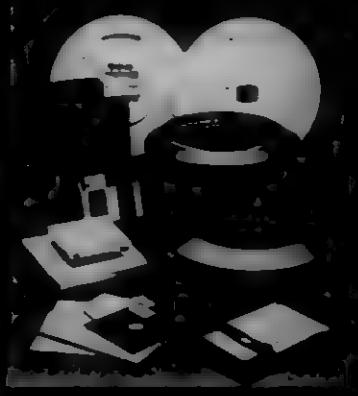

Bushkin Terms Protectionism 'Disastrous'

A recurring theme in the debate over whether the U.S. should impose restrictions on high-technology imports is that although such restrictions may benefit American industry in the short term, the long-range outcome would be disastrous. Arthur Bushkin, a former National Telecommunications and Information Administration official, argues this point forcefully.

"I have talked with many government people from other countries," said Bushkin, now president of a Washington, D.C.-based consulting firm, Telemation Associates, Inc. He has concluded that "once you get into a retaliatory spiral, each country tries to protect the areas where it feels it needs protection.

"The general consensus seems to be that if we start down the road to increased protectionism — or if we go much farther down the road, because we're already starting down the road — other countries that are not as well positioned as the U.S. in high technology will start placing restrictions in those areas where the U.S. is very strong," Bushkin said.

A Very Good Position

"We hear a lot about our problems with Japan, but certainly relative to the rest of the world we're in a very good position. And once you begin to legitimize protectionism as an approach, then other countries, seeing the importance of high-technology goods and services computers, telecommunications," will want to protect those areas, he said.

"High technology is a global market, communications is a global market ... And the failure of the recent ministerial meeting at the Gatt [General Agreement on Tariffs and Trade] to put the brakes on protectionism jeopardizes the high-tech companies, because it is an area where we have the most to lose, quite simply."

When asked how the U.S. should respond to what is widely seen as Japanese resistance to trading fairly in high technology, Bushkin responded, "It is important to recognize that every country, including the U.S. and Japan, has trade policies that are protectionist, and there's really two sorts of ways to solve that.

"One is for each guy to try to get tougher than the next guy, and that's the retaliatory spiral and everything gets worse, and ultimately you have an international gridlock.

"The second approach is for everybody to cool down and, slowly but surely, everybody back off ... Now we're at a fork in the road [trying to decide] which of those two paths we take.

"There's no doubt there's room for improvement on all sides, and the fundamental point is that if we begin to get into a retaliatory mode, then everybody loses," Buskin said. "And if we can maintain some sense of perspective then everyone will benefit. Everybody loses when you start clamping down. There are short-term victories and long-term losses. I think the situation is going to get worse before it gets better and the question is how much worse." ■

Arthur A. Bushkin

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White House Still Deciding on a Direction

The Reagan administration has been keeping a close eye on high-technology matters lately, but some members of the administration do not like what they see.

The preliminary draft of a study on U.S. competitiveness in high-tech industries made by the Cabinet Council on Commerce and Trade states that although "the United States retains broad leadership in computer hardware and software production and technology ... the Japanese have begun to close the gap in a variety of sectors." Specifically, the study states, "the United States no longer has the lead in several important areas of semiconductor technology."

Commerce Department official William Finan noted that when the Cabinet group polled about 50 chief executives of high-technology firms, it found "pretty much a consensus ... [that] there's reason to be concerned" about the continued competitiveness of U.S. industries, but no consensus on how to remedy the situation — whether by restructuring tax laws to encourage research and development and investment or by intervening more directly in trade disputes.

Sources in Washington, D.C., indicated that when the study was presented to the Cabinet in late October, several high-level officials urged high-technology import restrictions. No decision has been made on this yet; the assessment is undergoing further work at Commerce for final action early in 1983.

No White House Decision Yet

Nor has the White House made a decision on how to approach the problems of high-technology industries, according to sources close to the administration deliberations. Finan confirmed that point when he said the outcome of the project "is unclear at this point."

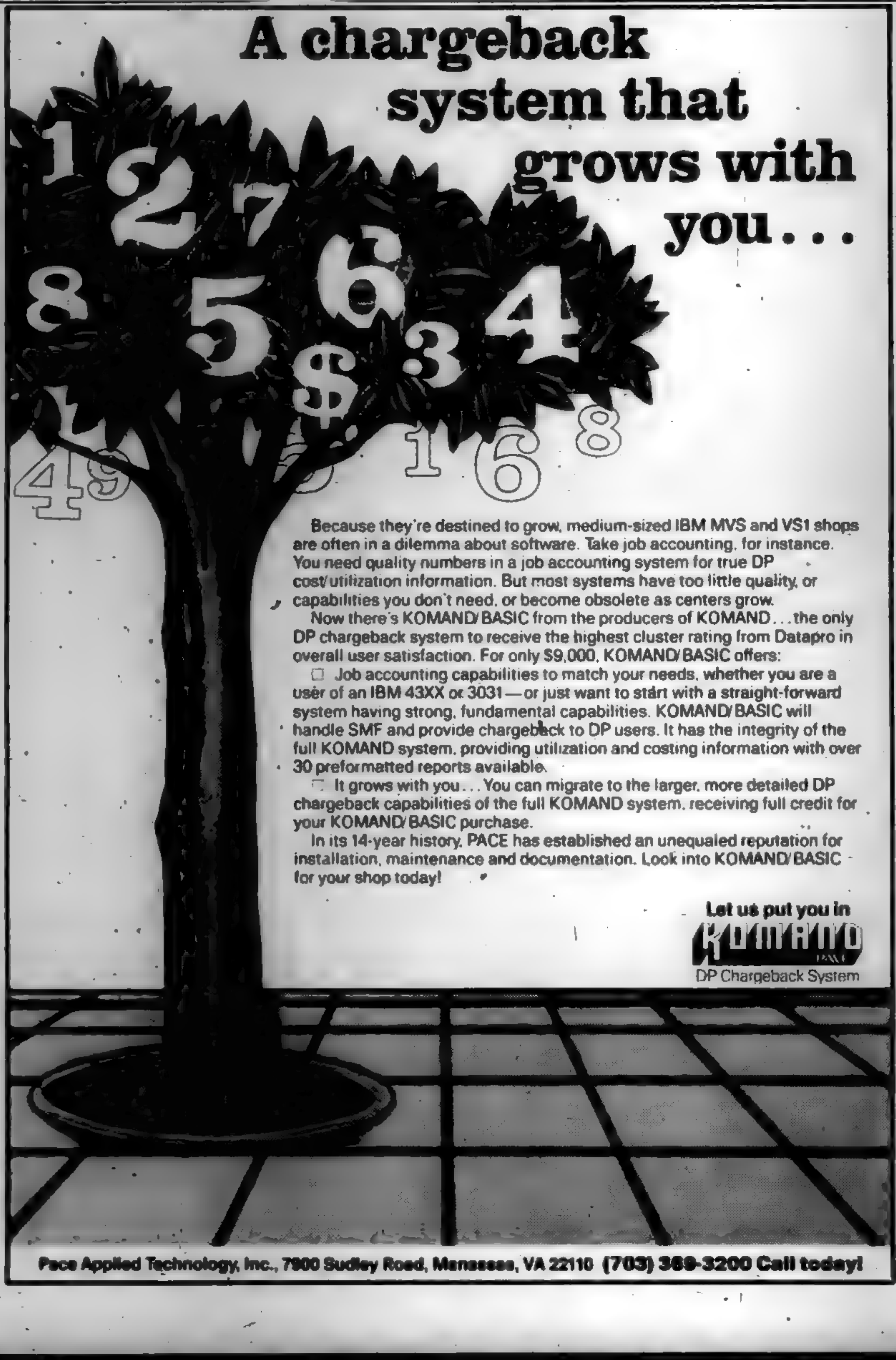
The forceful free trade position of trade representative William Brock has, for the moment at least, the backing of President Ronald Reagan, who in a Nov. 20 national radio broadcast said of protectionism: "[Some] call that getting tough. Well, I call it stupid."

But free trade sentiment in the White House is not necessarily all that strong. There is considerable pressure from elsewhere within the administration, particulary from the Commerce Department, to take a tougher stand, especially against Japanese imports. The point man in this push is Undersecretary for International Trade Lionel H. Olmer, a former Motorola, Inc. executive, who in December was part of the U.S. delegation to trade talks in Japan with that country's new government.

Olmer has been widely quoted of late arguing that the Japanese semiconductor competition threatens to cripple U.S. firms, potentially leading to eventual U.S. reliance on Japanese sources for critical military electronics items. Olmer is backed by Commerce figures showing that Japanese exports of integrated circuits to the U.S. doubled during the first nine months of 1982. The $346 million worth of Japanese semiconductors imported into this country was more than double the comparable U.S. exports to Japan of $118 million.

On the plus side, the U.S./Japan Work Group on High-Technology Industries recently developed a set of recommendations for resolving some of the high-technology conflicts between the two nations. The recommendations bind both governments to principles to "assure full mutual access to trade and investment opportunities and full national treatment for resident foreign firms in access to government-sponsored R&D programs and other national programs which provide advantages to domestic industries."

U.S. industry and government officials are now waiting to see what steps the new Japanese government will take to defuse this tense situation. The new Japanese prime minister, Yasuhiro Nakasone, in statements shortly after his election, promised resolution of trade issues with the U.S. will be a priority. ■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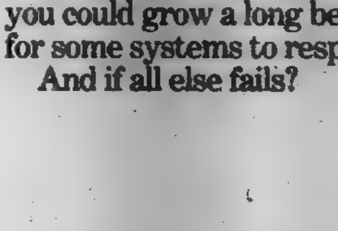

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(Continued from Page 62)

we're moving into an information society, then human capital is the most important form of capital. You've got to invest in human capital."

Bushkin added that "the new Democrats seem to recognize these issues, and the important thing they are doing, it seems to me, is not [to offer] any particular solution . . . but what they're doing is putting these issues into the political debate. These issues are central to the economic future of this country, and we cannot simply treat them as interesting issues relevant only to one sector. And that's what the Atari Democrats are saying."

One immediate effect of this addition of high technology to national political debate, Bushkin noted, is to spur the White House to become more involved in technology and trade issues. These topics are sure to be important in the 1984 presidential campaign, he said, and the White House knows it must put Ronald Reagan at the forefront of these issues.

If there is any consensus on these issues, it is that everyone benefits from an open trading system. But given today's economic problems around the world, there is little faith in the current negotiating structures' ability to ensure free trade. The prime instrument, the Gatt, seems a very fragile bulwark indeed. And there is sentiment here and abroad for scrapping that structure altogether if it does not prove adequate to the current challenge.

The U.S. Senate will begin hearings soon on the Gatt and its efficacy in the current geopolitical setting. Even the staunch free trader and Gatt apologist, Brock, admitted the Gatt organization may have outlived its usefulness.

But what the U.S. must refrain from doing at all costs, according to Brock, is to scrap the Gatt, or some equivalent negotiating mechanism, in favor of seeking more bilateral and multilateral agreements on our own. "The advantage is awesome" for the U.S. to be a member of Gatt, he said. "If we didn't have a Gatt we'd have to invent a Gatt."

Why? Because the U.S. is "the only truly global power in the Gatt." American firms trade in every country of the world, he explained and, therefore, need some trade structure to facilitate commerce.

Unfortunately, he added, our adherence to the Gatt's open trade principles makes us vulnerable to trade restrictions by individual trading partners. "One of the prices is we have to abide by the rules when they don't," he said.

Although it may be tempting to fight back with equivalent trade barriers, Brock argued, the short-term specific market advantages would be outweighed in the long run. If we don't stand up for the system, no one else will, is how Brock put it.

A quick rebound in the world's economy would give the open trade system a much-needed shot in the arm, but the outlook for that happening is not good, to say the least. Every analyst, from Nobel Prize winners in economics to corporate strategists, is planning with the assumption that the worldwide recession will be overcome only with great difficulty and only after considerable time.

And when the economy does get better, there are some industries that will never recover. Millions of workers displaced during the past two or three years will never find reemployment in their previous occupations.

Every developed industrialized nation now understands, at least to some degree, that the future is in high technology. The U.S. government is now being sensitized to this; European countries and Japan have understood this very well for some time and have made considerable progress in developing national strategies for fostering and cultivating their high-technology sectors.

And so the scene is set for a major and protracted trade war in numerous high-technology areas. The imminent trade battles in the automobile, steel and agricultural sectors will only exacerbate the situation and accelerate the trend toward high-technology protectionism. ■

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Forecast '83

The Semiconductor Industry

1983 Will Get Better . . .

By Robert Batt

For the semiconductor industry, which has prided itself on continuous double-digit growth, the last two years have been uncomfortable.

Beset by the recession, increasing competition from the Japanese and price attrition across all product lines, the major U.S. chip manufacturers will post lower earnings for 1982, with the industry overall growing 5%. However, 1983 is shaping up as a transition year, with most industry pundits forecasting a stagnant first half followed by a modest recovery in the second six months.

In fact, most analysts see 1983 as a time to gear up for the boom expected in 1984. Dataquest, Inc. of Cupertino, Calif., for example, forecasts that the semiconductor industry will grow 13% next year, mostly in the fourth quarter.

Many companies within the semiconductor industry are hoping that the belt-tightening measures they took in 1982 will pay off in the next 12 months. According to Seth Goldwin, an analyst at New York-based Paine Webber, Mitchell Hutchins, in the last year many semiconductor vendors concentrated on controlling costs through discipline in manufacturing processes, layoffs and extended work weeks in the hope that when the recovery comes, they will emerge in good condition.

The semiconductor vendors themselves are upbeat about their prospects. Keiske Yawata, president of NEC Electronics USA, Inc., for example, predicts a growth rate of 20% in the coming year compared with 1982. Most of the growth will come in the second half of the year and will occur mainly in the high-technology product sector, according to Yawata.

"The higher the technology you use, the greater the return on your investment," he said. "Those companies which have updated their processing capabilities will be in the best position to compete."

According to Tom Hinkelman, executive director of the Semiconductor Industry Association (SIA), 1982 was as much

(Continued on Page 70)

Robert Batt is a Computerworld *West Coast correspondent.*

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1983 Will Get Better . . .

(Continued from Page 67)

a year of price recession as it was of volume recession. Overcapacity, he claims, led to weak prices.

Once the physical demand for semiconductor products picks up, there will be an upturn in prices and profits, Hinkelman predicts.

A Deceptive Season

Some companies, eager to be at the forefront of any upturn in the economy, were premature in their assessment of the industry's fortunes. Last spring, order rates surged, and companies like Intel Corp. and Advanced Micro Devices, Inc. (AMD) began preparing for the recovery they were sure was just around the corner. However, the surge in orders was only temporary, and Intel, which had hired 3,000 extra people, was forced to impose a salary freeze.

Despite expressed hopes that 1983 will be better, not everyone is convinced that the worst is over. "The real problem is that the computer industry in 1982 was not the vibrant force that it usually is for a component market like semiconductors," observed James Magid, analyst at L.F. Rothschild, Unterberg, Towbin, Inc. of New York. "Nor will it be in 1983.

"We are now going into the steep part of the recession. There are likely to be shortages and dislocations over the next six months, and the leading companies are likely to dominate production at the cost of the smaller vendors."

The consumption markets for semiconductor products — the computer industry, for example — are for the most part reliant on heavy capital expenditures. Because of this, the semiconductor industry is less prone than in the past to lead the economy out of a recession, several analysts have noted.

Paine Webber's Goldwin explained, "The cost structure of semiconductor manufacturing is one of high fixed costs and low variable costs. When a vendor goes below the break-even point, he loses a lot of money; above that point, he starts making a lot of money."

While some areas of business for the semiconductor industry have been doing well — like video games and personal computers — these pockets of strength have not been strong enough to offset such weak areas as the mainframe and minicomputer markets. "The recession has crimped demand," Magid said. "Computer users are no longer in control of their requirements, and this has had an enormous influence on semiconductor components."

Realignments Ahead?

The enormous demand for semiconductor components for toys and games has led to a discombobulation in the market because of the extra pressure put on discrete semiconductor components, Magid explained. "If the current trend continues, some companies will not survive in their present form."

Other industry analysts contacted by *Computerworld* agreed with Magid. Among the companies believed heading for major management changes in the year ahead are National Semiconductor Corp., AMD and Texas Instruments, Inc.

Some analysts believe there could be realignments within the industry. "There are companies which are cash-short and whose stock values are such that they will be attractive to prospective buyers. Because these companies need to invest, they will be subject to takeovers," SIA's Hinkelman predicted.

However, in a recent speech to analysts and vendors in San Jose, Calif., Tad La Fountain, vice-president of research at the New York brokerage house of Shearson American Express, warned that the joys of ownership are not always what they seem to be. "Buying businesses in a high-growth industry where capital infusions can promote long-term viability makes sense; paying up for them does not. A lot of captives have worn out their welcome with their parent's finance committees, particularly the broadline manufacturers who are subsidiaries of large corporations."

Many vendors are looking for a continued growth in demand for their components from the small systems manufacturers to offset weaknesses in the higher reaches of the computer market. Although computer companies as a whole experienced a slower year than usual, several firms, such as Tandem Computers, Inc., Digital Equipment Corp. and Prime Computer, Inc., had sizable growth rates and continued their demand for chips.

It appears that in the year ahead, semiconductors will continue to be a business related to capital spending despite rapid growth in the consumer segment and the $1 billion military market. Continued emphasis on research and development is a must, and those companies that have invested in the latest processing technology will be in the best position to take advantage of any boom in the economy.

As Magid put it, "The industry a year from now will have gone through a very hazardous period. Right now the outlook for some is dismal and management will be severely challenged in the year ahead. But there will be survivors for whom the outlook is one of three to four years of spectacular growth." ■

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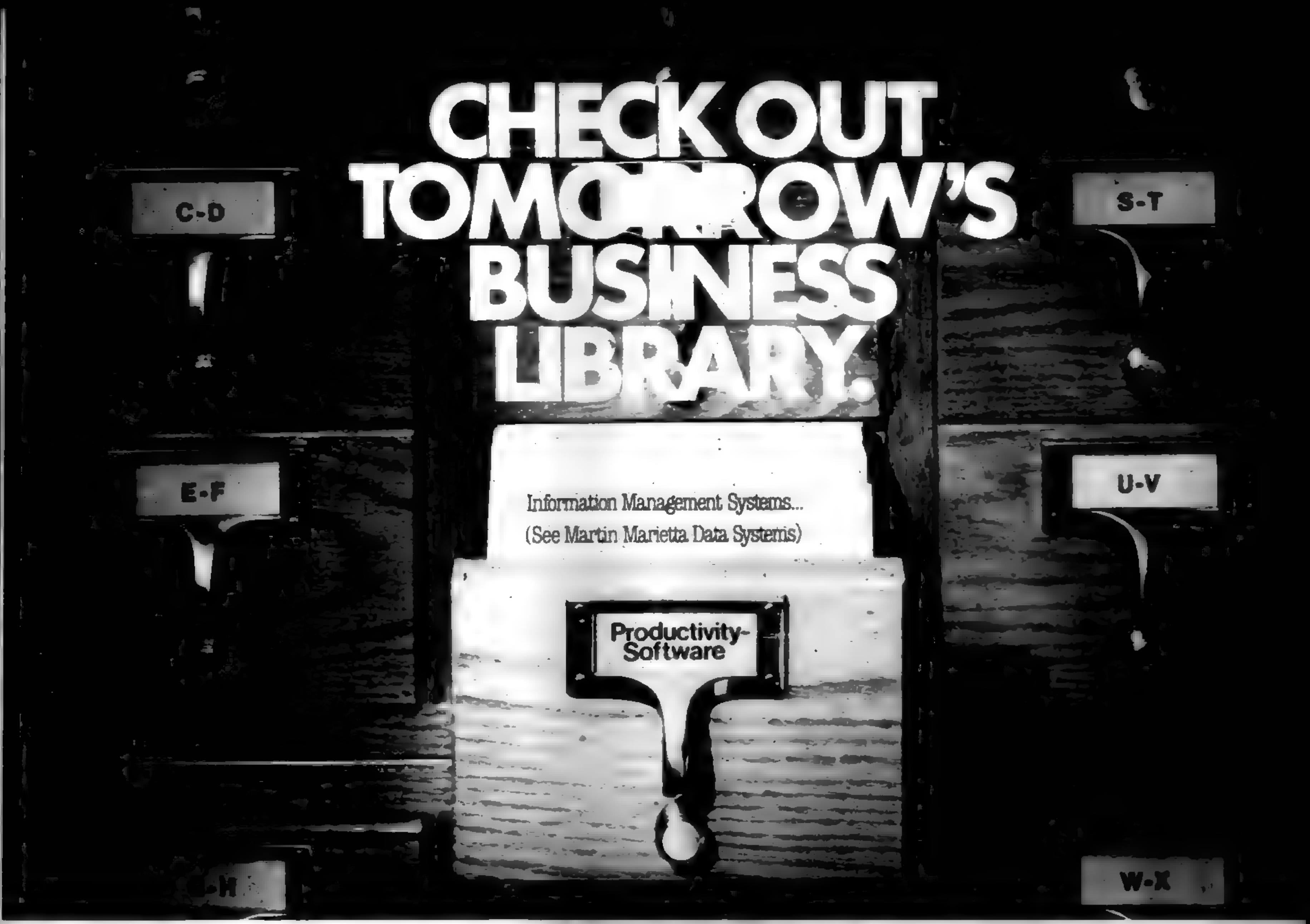

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Who'll Succeed in Semiconductor Arena in '83?

When it comes to predicting which semiconductor vendors will do well in 1983, two issues are of crucial importance — the development of technology and the dexterity with which those developments are managed.

Most industry experts do not anticipate dramatic technological changes over the next 12 months. Instead, they anticipate evolutionary changes, if only because the expected boom in demand is believed to be only a year or so away, leaving no time to develop new technology.

The vendors that will succeed in '83 are expected to be those that have their market force in place and are set up to meet customer requirements faster than their competitors.

Many pundits believe the importance of software will dramatically increase because of the nature of very large-scale integration (VLSI) products. "We do not yet know what VLSI means in terms of product definition except to say it will certainly contain a lot of software," observed Keiske Yawata, president of NEC Electronics USA, Inc.

One of the intriguing questions for 1983 could be who owns the VLSI system — the manufacturer or the user who employs the system and utilizes the manufacturer as a kind of silicon foundry. "There will be lots of fights over this issue," Yawata predicted.

Trend Seen

Several analysts see a trend toward custom and semicustom gate arrays and cell libraries. The market is a popular one. The Semiconductor Industry Association estimates that 30 companies have entered this arena in the past year.

"The rationale is to offer software-based design tools to system engineers to dramatically drop the cost of manufacturing custom chips and thereby add to the flexibility of manufacturing," explained Seth Goldwin of Paine Webber, Mitchell Hutchins. One of the major ways U.S. manufacturers could continue to compete with their Japanese counterparts is to start offering a service rather than just a product, he said, citing design tools as an opportunity to do this.

Another area in which price competition is proving crucial is in the market for 64K-bit random-access memory (RAM) chips. Japan's initial domination of the market seems to have been blunted so that its market share is down to about 55% compared with 75% not long ago.

Next year is also expected to witness the development and introduction of several versions of the much-touted 256K-bit RAM.

In static memories, the issue for the coming year is whether U.S. manufacturers can wrest back the lead ceded to Japanese competition, particularly in the Cmos technology area.

In the fast-growing area of erasable programmable read-only memories, industry analysts predict that 1983 will see such industry leaders as Intel Corp. and NCR Corp. joined by others, most notably Motorola, Inc. and Texas Instruments, Inc. The challenge in this sector is to bring the products to market.

"In all these areas, management will have to select carefully those areas that are most meaningful to their companies and stay out of those markets which are not. Successful companies will be those that accurately focus on these developing markets," said Dan Kleisken, vice-president at Dataquest, Inc., a market research firm.

With the mainframe and minicomputer markets likely to remain sluggish through most of 1983, many semiconductor vendors are concentrating on increasing their performance in the personal computer market.

James Magid of New York's L.F. Rothschild, Unterberg, Towbin, Inc. said "microprocessors and developments in software will open up new vistas to personal computer users beyond anything now known." ■

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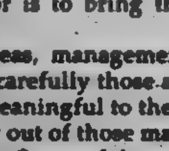

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Feds Expected to Squelch 'Gray Market'

A multiagency task force to control the so-called "gray market" in semiconductor devices was set up by the U.S. government last September. The project has since been placed on the back burner, however, as President Reagan turned his attention to clamping down on the narcotics trade.

Nevertheless, if 1982 — a year of sting operations, industrial espionage and sundry undercover activities — is any indication, the coming year will almost certainly witness an increase in efforts to staunch the illegal export of technology.

What is the gray market? It is an area in which dealings are neither black or white — a market in which chips are stolen and then sold to legitimate dealers, who do not question the chips' origins but resell them as if they had acquired them legally. The chip dealers essentially "launder" the stolen chips.

"The gray market is legitimate and illegitimate at the same time," explained Marvin Zietzke, corporate investigator for Intel Corp. "Part of the market is made up of dealing in stolen components and technological information, the origins of which are many and varied."

The market in stolen semiconductors and other micro devices is conservatively put at $100 million a year.

> *'The gray market is legitimate and illegitimate at the same time. Part of the market is made up of dealing in stolen components and technological information, the origins of which are many and varied.'*

Much of this illicit trade centers on California's Silicon Valley, where just over a year ago Monolithic Memories, Inc. of Sunnyvale lost $2.7 million in semiconductor devices. Half of the stolen goods were recovered, but some of the remainder is believed to have reached the Eastern Bloc and the USSR.

According to Zietzke, the trail into the gray market often begins when a company employee steals some unmarked parts from his company's premises and then sells them to a dealer. The parts, while often untested, are re-marked by the dealer as if they were tested and then either sold abroad, often to East Asia, or to the original company's competitors.

There is also a reverse trade. Employees of the large chip manufacturers that have assembly plants in Asia siphon off parts on their way to the U.S. Those parts find their way into the gray market and end up with some street vendor in Hong Kong, for instance.

With some semiconductor devices, such as microcontrollers, currently in high demand, gray market dealings can be very lucrative. According to Richard Camps, vice-president of Barrick Security Group, a San Mateo, Calif., securities organization that has served as an investigator for several Silicon Valley firms, many electronics dealers indulge in this market.

"Seventy percent of their dealings are legitimate, but if the deal looks right they will close their eyes to dubious products," Camps said. "They have fence reputations."

The federal task force formed last September has been welcomed by semiconductor vendors worried about breaches in their security operations. "Strict controls need to be put in place. There are a lot of holes in the organizational structures of many companies which have grown rapidly over a few years," Zietzke said. "As they mature, hopefully their procedures and security will be buffered."

Putting such controls in place, however, is not that easy. Integrated circuits, for example, are difficult devices to monitor constantly. Companies are faced with setting up a security system that works while not placing intolerable controls on employees.

There are those who argue that the gray market is of the manufacturers' own making. One dealer accused of dabbling in the gray market commented, "The semiconductor industry contains some of the slimiest people in business. It's a profitable industry, but the people in it are not the greatest, particularly at the higher areas of management. Many of the large companies are intrinsically dishonest."

While those not quite so close to the action talk in more dispassionate terms, there is still some agreement that semiconductor vendors are not entirely blameless.

Explained Bob Zook, a high technology management consultant at Arthur D. Little, Inc. "It's a fairly unsophisticated market still and its rapid growth has led to some nebulous marketing channels." In a supply-and-demand situation, those who have an excess of parts sell to those who are in need of them. It's very difficult for an end user to keep an optimum amount and when it comes to standard chips, he will often go to any source from which he can get them. In such a situation, a second market grows up and is susceptible to dubious practices." ■

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Semi Market to See Either Japanese Response

One issue certain to be at the forefront of computer industry news next year is that of Japanese competition in semiconductors. The coming 12 months will either see the Japanese respond to U.S. grievances or the start of a trade war that could have profound implications for Western industrial democracies.

If semiconductor trade conflict between U.S. and Japanese manufacturers continues and if the Reagan administration succumbs to pressure to introduce legislation against the Japanese, the consequences will be very serious, according to Keiske Yawata, president of NEC Electronics USA, Inc.

"If the administration introduces a lot of nontariff barriers, the Japanese business in semiconductors will be badly affected because much of Japanese industry in the U.S. is based on offshore manufacturing. If the U.S. imposes barriers, the Japanese will reciprocate and we will have a version of what I call semiconductor war," Yawata warned. He advised U.S. observers not to underestimate Japan's ability to take countermeasures against the U.S.

While Yawata regards this as a "worst case" scenario, he believes that if the economy continues to be sluggish, the chances of such an outcome increase.

Japanese Bluffing?

Many U.S. observers of the semiconductor scene, however, think the Japanese are bluffing. According to Tom Hinkelman, executive director of the Semiconductor Industry Association (SIA), there is no possibility of semiconductor war.

"The numbers just don't add up for the Japanese," he argued. "Any reaction the Japanese make to U.S. measures will hurt the Japanese more than the U.S."

Hinkelman claimed Japan is in clear violation of the General Agreement on Tarrifs and Trade because it has failed to open its domestic market to overseas semiconductor competitors and because it has continued to provide subsidies to its manufacturers.

The SIA chief warned that a protectionist spirit is already afoot in the new U.S. Congress. "Given that a third of our business is overseas, we [the SIA] do not believe protectionist legislation is the answer, but we are afraid that Congress will run with this to the detriment of all concerned," Hinkelman said.

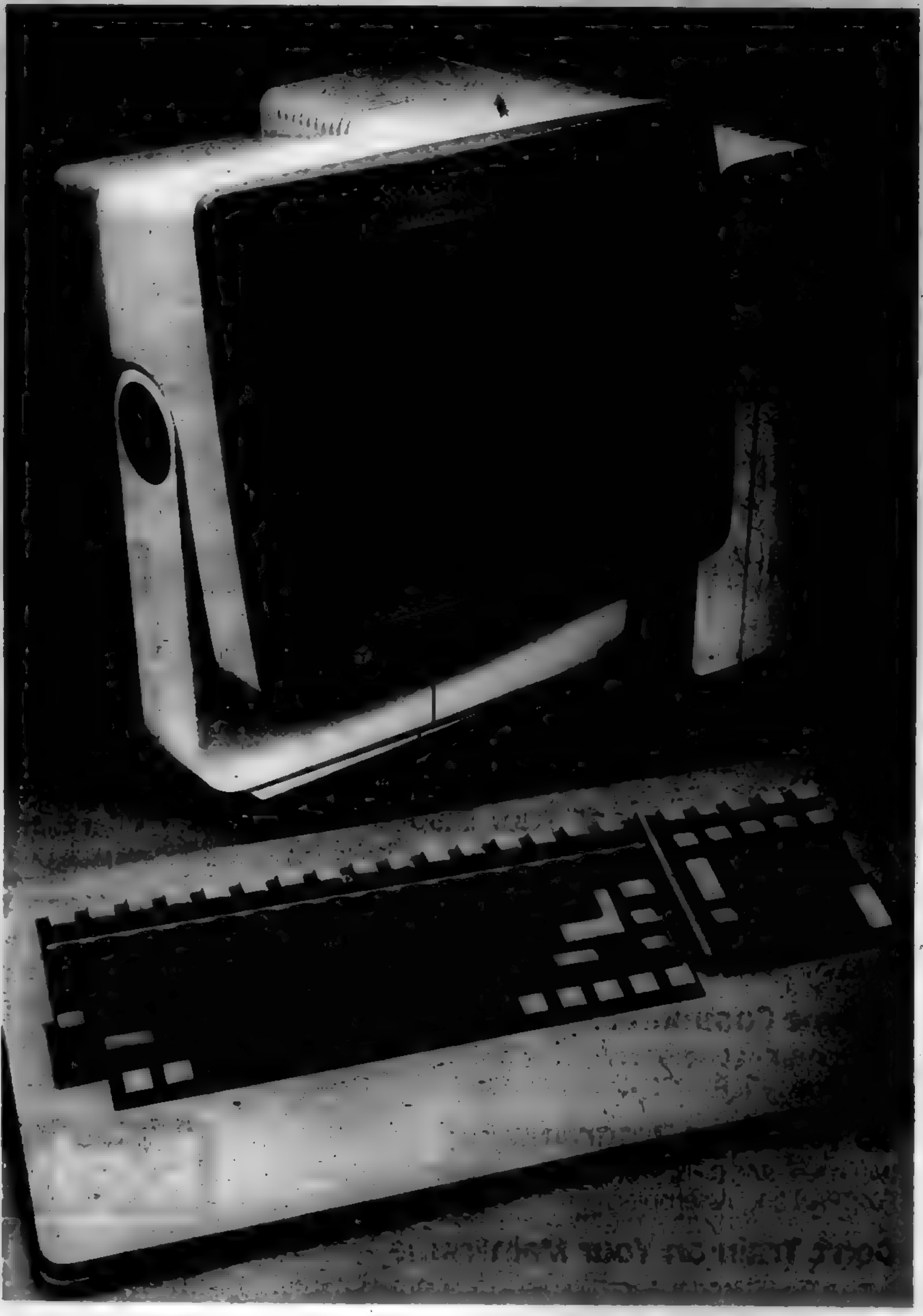
In recognition of the gravity of the situation, the U.S. and Japanese governments agreed in November to monitor the performance of their respective semiconductor sectors in the other's market. The outcome will be of vital interest to users of data processing equipment.

Explained Seth Goldwin of New York's Paine Webber, Mitchell Hutchins, "The users have a vested interest in the survival of a strong U.S. semiconductor industry. The pace of innovation in computers has come from developments in semiconductor technology. This in turn has been a major engine for reducing end-user prices."

Main Beneficiary

"So far, the user has been the main beneficiary of the rise of the Japanese. But if low profits drive U.S. manufacturers out of business, these advantages will disappear."

This is because the end-user advantage depends on maintaining a balance between U.S. and Japanese vendors, Goldwin explained. If one begins to predominate, cost reductions become less likely and innovation is



to U.S. Grievances or the Start of a Trade War

slowed down as the cartel tries to hold onto its market base.

One of the major advantages enjoyed by Japanese semiconductor manufacturers results from the nature of business arrangements in Japan. Capital financing in Japan is heavily debt-oriented, which allows semiconductor vendors to look at long-term cash flow rather than accounting earnings.

As a result, in times of recession the Japanese vendors can cut prices and sell more even at the cost of short-term profits.

Such practices have forced U.S. manufacturers to do likewise. Because of a different business culture, however, the American companies have seen their profits heavily impacted.

"If Japanese companies go for market share, they will be able to tolerate lower prices and lower profits than overseas companies over the long run," Goldwin asserted.

Many analysts are now convinced that the Japanese have made worldwide dominance in semiconductors a top national priority. Their strategy is to "outmarket" anyone in the areas in which they are strong — for example, Cmos technology — and to catch up rapidly in the areas where they lag.

Companies such as Hitachi, Ltd. and Fujitsu Ltd. are making a big push to develop some kind of microprocessor capability to reduce U.S. domination (by Intel Corp., among other U.S. firms) of the Japanese market in that area.

James Magid, an analyst at New York-based L.F. Rothschild, Unterberg, Towbin, Inc., predicted that in 1983 the Japanese will have a major breakthrough in semiconductor components for the personal computer market and that by 1986 they will be in a position to dominate the Cmos market at the expense of the U.S.

New Spirit

Such potential developments have led to a new spirit of cooperation among US manufacturers determined to pool their resources to meet the Japanese threat. Many companies are now sharing research and development knowledge and working on alternative source arrangements in a way unheard of even 12 months ago. With almost a "back-to-the-wall" mentality, suppliers and users are in closer cooperation than ever before.

"We need to do everything we can individually and collectively to meet this challenge," said Jim Fiebiger, corporate vice-president at Motorola, Inc. "There is an attitude among U.S. semiconductor manufacturers to work much more closely together and utilize resources.

"At the same time, there is a recognition that we are not playing within the same ground rules as the Japanese. The U.S. market is open and the Japanese one is not, and I think we may see some government action to fix these things." Fiebiger also suggested that the rules governing intracompany cooperation be relaxed to allow for a more concerted U.S. effort against the Japanese.

This view of the situation is not, of course, shared by Japanese manufacturers. NEC Electronics USA chief Yawata accused U.S. semiconductor vendors of putting pressure on U.S. distributors not to buy Japanese products. "Some people are also being told by U.S. semiconductor manufacturers that soon there will be regulations and Japanese companies will have to reduce their operations in the U.S.," he added. ■

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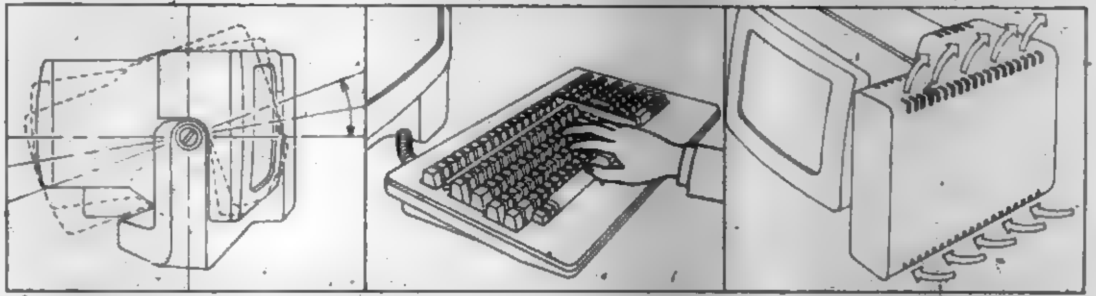

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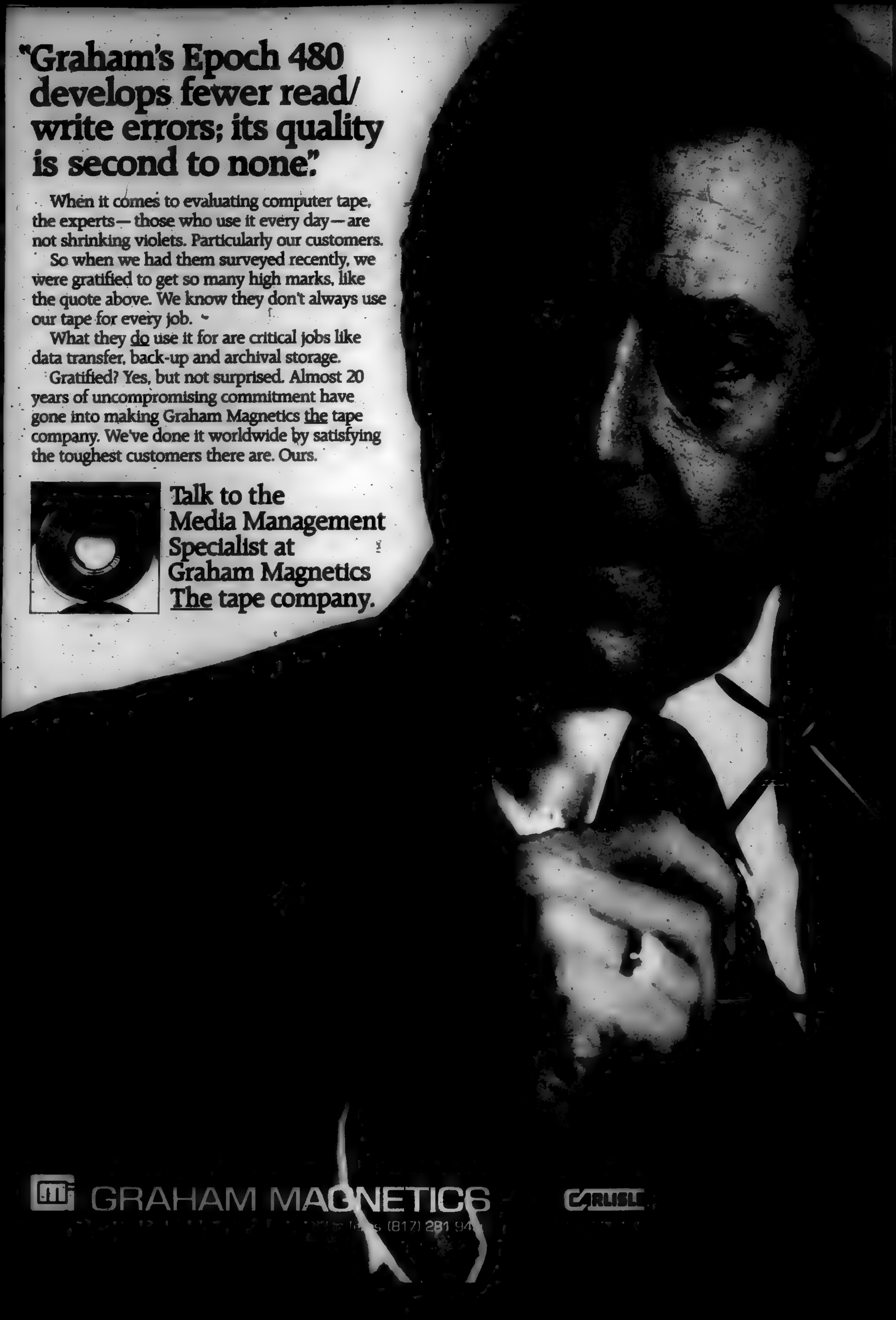

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Technology Under Development

A Look Behind Closed Doors

By Tom Henkel

Industry watchers are forever abuzz over new technologies, how they change the face of data processing and how things will be better in the future.

Computers that think, storage systems that incorporate data and visual information, lightning-fast processors and communications systems that can run rings around current technologies have all been touted as being right around the corner. In fact, those technologies all exist today; you just can't buy them yet. Ironically, computer makers devoted to catching the speed of light on tiny pieces of silicon are sometimes slow to announce products that are based on new technologies.

There are many factors that influence a firm's decision on when to announce a new product. For instance, as systems become more complex, it becomes more difficult to prove a new technology works well enough to make it an integral part of a company's product line. Issues like compatibility, upgradability, developing good mass production techniques and maintainability are strong considerations in whether to offer a new technology as a commercial product.

Another strong deterrent is the fear of being wrong or at least slightly behind the technological times. While the firm first to announce a new technology often wears the laurels of a trend setter, a technology that fails is an embarassment. To big companies, such an embarrassment can be a painful lesson. However, to smaller firms, these embarrassments can prove to be fatal.

Probably one of the most talked about technologies of this century is computers that do the thinking for you. Artificial intelligence, a software design technique that basically allows a processor to make decisions based on a set of ground rules, is one of the first steps in that direction. So far, the technology has remained a plaything of university scientists and large corporate research and development departments. But it may not be long before artificial intelligence makes a gradual appearance on the commercial front, according to Howard K. Dicken, president of DM Data, Inc., a Scottsdale, Ariz.-based consulting firm specializing

(Continued on Page 80)

Tom Henkel is a Computerworld *writer/analyst.*

(Continued from Page 79)

in artificial intelligence.

Dicken maintains that a handful of companies, mostly small firms, are now offering programs that qualify as true efforts of bringing artificial intelligence to the commercial sector. For the moment, most of those programs are aimed at fairly specific application areas, such as genetics research and oil exploration.

There are still problems with artificial intelligence. "We don't know how an expert thinks," Dicken maintained, adding that giving a programmer the task of developing smart software based on interviews with experts on a given field is extremely difficult.

Most developers of artificial intelligence software spend weeks interviewing people who mentally make decisions and draw conclusions on a given subject.

But summing up a lifetime or several lifetimes of knowledge in the form of a program often leads to a trivial treatment of the subject. Even worse, it sometimes results in a package that develops erroneous conclusions, Dicken said.

Despite recent developments, artificial intelligence is far from being considered a trend in terms of commercially available software. Most big computer companies, such as IBM, Texas Instruments, Inc. and Digital Equipment Corp., have internal artificial intelligence packages, according to Dicken. But none have announced a commercial product.

The reason those companies haven't announced artificial intelligence software is that a general package is almost impossible to produce. Very specialized packages, on the other hand, have limited audiences and can be difficult to cost justify in a large corporation.

The first true artificial intelligence packages will probably come from small companies that often can make a handsome living selling packages that appeal to a finite number of users, Dicken pointed out.

However, at this point, few smaller companies are equipped to offer a full-fledged artificial intelligence package.

Over the next few years groups of smaller companies will most likely join forces, combining bits of artificial intelligence knowledge, to develop full-fledged packages. Those packages will then be offered to system users or picked up by the larger vendors and offered as part of specially designed systems, Dicken maintained.

The Storage Controversy

Current methods of storing data have long been criticized as lagging behind improvements in processor technology. Today, a controversy appears to be brewing over whether magnetic media storage devices or new optical storage devices will win the favor of systems developers.

Proponents of optical recording techniques say data etched into record-like disks is more durable than magnetic recording techniques and offers the big advantage of being able to store pictures, graphs and copies of actual documents along with standard data.

Critics of the technology point to the fact that, at present, information stored on optical disks cannot be erased. The Japan Broadcasting Corp. recently developed an erasable video disk, but it is still very much in the prototype stage.

Another drawback is the optical disks' inability to retrieve as much data at a given time as current disk drive technology.

Supporters of optical techniques note that some vendors, particularly the Japanese, are currently working to develop erasable optical disks and faster ways of recording and retrieving data. Proponents of the technology also note that in some ways a nonerasable optical disk can prove an advantage, providing an excellent audit trail.

However, finding a place to store many disks, coupled with the current relatively high cost of optical disks, appears to be a disadvantage.

Just as ways of storing data have drawn criticism, ways of shuttling it around have been called inadequate as well. Some industry watchers contend that with more and more users getting into networking and data transmission, there is a stong possibility that there won't be enough frequencies available to give everyone a unique avenue for transmitting data.

Communications analyst Dixon Doll, president of The DMW Group, Inc., an Ann Arbor-based consulting

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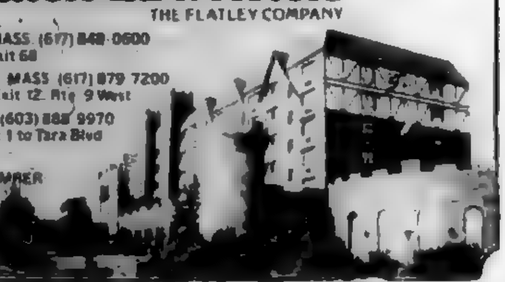

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firm, notes that DPers in large metropolitan areas, such as New York, are already feeling pinched by limited data transmission frequencies.

Doll noted there are several technologies that can expand data transmission frequencies, but none have received strong attention from developers of communications products. The reason, Doll explained, is largely because the demand for such products is still soft.

Digital termination systems (DTS), a microwave-based technology that can be used to bypass a local loop, is probably the simplest technology to develop, Doll said, and some firms will introduce DTS systems within the next year. But, one disadvantage of DTS is that it is more appropriate for data than voice technology.

Cellular radio, an enhancement to standard mobile telephone technology, can also be used to transmit data. The relatively easy combination of voice and data transmission, according to Doll, makes it an attractive alternative to local loops. However, the federal government has thus far only granted approval to a handful of vendors to offer such a product.

Boosting the frequency of satellites is another way of opening more communications paths for users. Satellites now operate in the 12- to 14-Ghz range. But, theoretically, satellites could be expanded to operate in the 20-Ghz and above range.

Doll explained that not only would higher frequency satellites provide users with more communications paths, the higher frequencies have an added advantage of requiring smaller and cheaper earth stations.

An Expensive Venture

The delay in launching high-frequency satellites, Doll explained, is occurring because few networks are designed to support high-frequency transmission. Since launching a satellite is an expensive and somewhat unpredictable venture, few firms are willing to invest heavily in a device that cannot be immediately used, Doll maintained.

However, over the next few years, Doll said, some hybrid satellites will be launched. These units will offer traditional frequencies plus some high frequencies.

When it comes to processors, it can take about 15 years to get "around the corner." Josephson Junction, optoelectronic and biochip technologies have all been touted as the basis of tomorrow's processors, but none of those technologies have been sufficiently developed to allow serious testing, much less development of end-user products.

For the interim, analysts feel the next generation of processors will involve an integration of smaller processors dedicated to making a variety of features convenient and easy to use. Some researchers believe tomorrow's processors will become more specialized, employing hardware features that allow them to accomplish specific tasks.

Currently, many processors are designed to be blank slates, which are then customized by users with specific systems software and applications. In any case, processor advancements tend to hinge on advances in chip technology, which themselves are still in the development stages. ■

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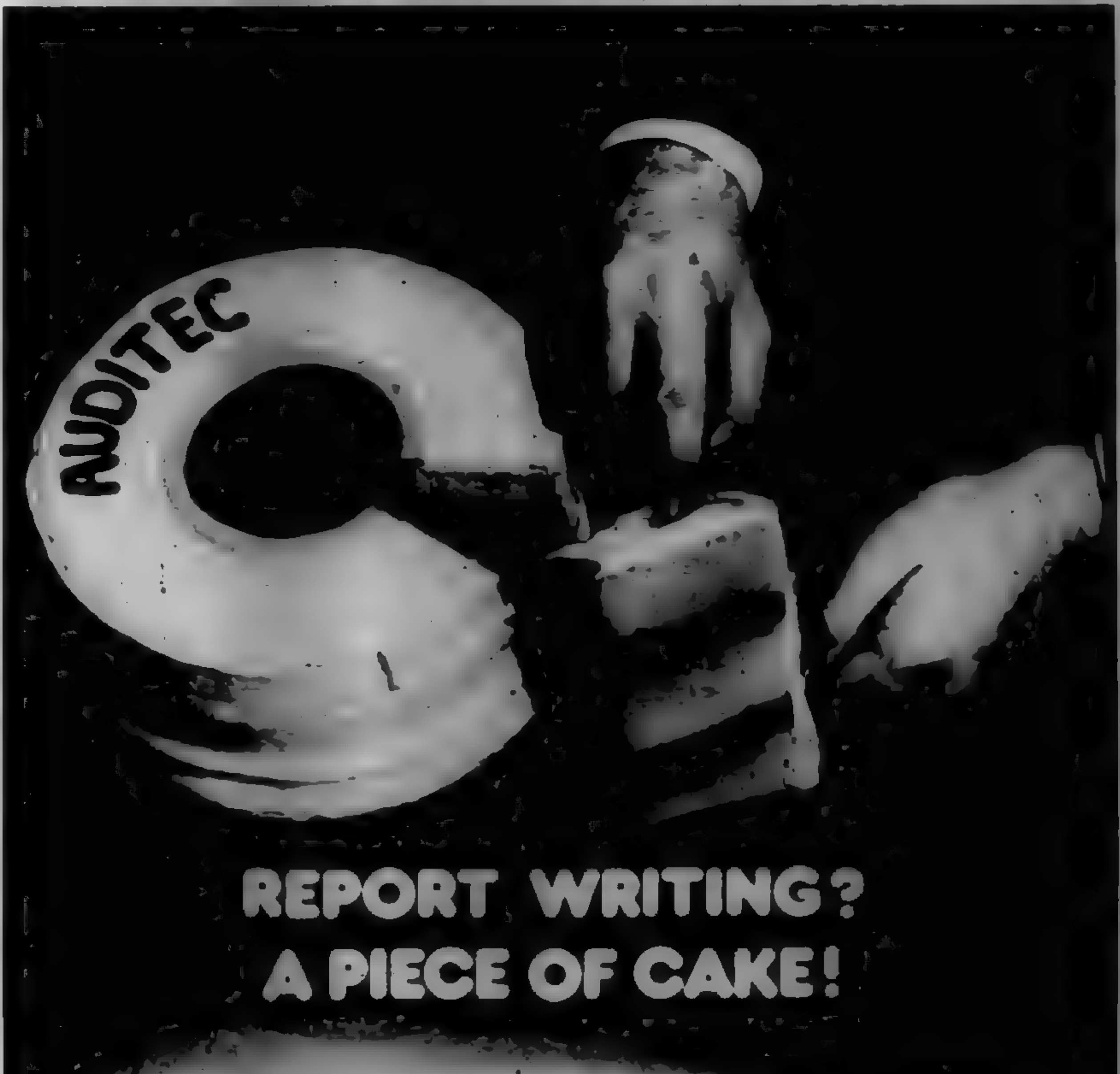

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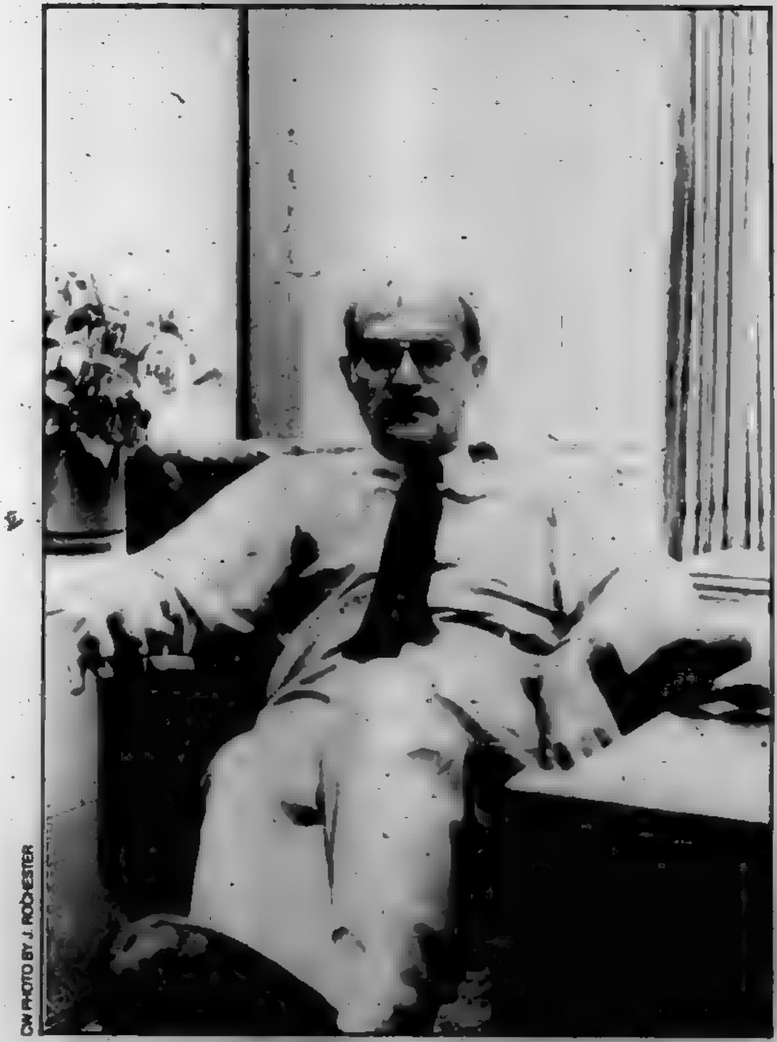


CW PHOTO BY J. ROCHESTER

A Conversation With Hank Koehn

A Glimpse At the Future

By Jack B. Rochester

Hank Koehn's first computer job was wiring control panels for IBM 604, 407 and 602A processors in 1952. He went on to a variety of jobs that eventually brought him the title of DP manager — including one for a New Jersey lamp company that was throwing out its DP equipment and reconverting to a manual system. The assignments provided an unorthodox beginning for the career of a man who now bears the title of vice-president of futures research at Security Pacific Bank in Los Angeles.

Koehn's work has always been at the center of the conflict between man and technology. Before he started hard-wiring control panels, he studied behavioral science at Rutgers University and The New School in New York. He joined Security Pacific 14 years ago as a technical "systems person" and spent his time as an interpreter between end users and the DP department.

When Security Pacific executives determined — much to their surprise — that the future of banking is not technology-driven, they began to look for someone with an unlimited world view to examine the signals of change. Hank Koehn — systems analyst, DP manager, social scientist and futurist — was their choice.

"The traditional DP department won't survive the '80s because of the diffusion of technology," Hank Koehn believes. "It can't possibly survive due to what I term the three Cs — continuity, choice and change."

Koehn explained that "through the end of World War II, the U.S. was an industrial and manufacturing nation, then we started to move into the service era. By 1948, 48% of the work force was in some service occupation — teaching, banking, medicine, insurance.

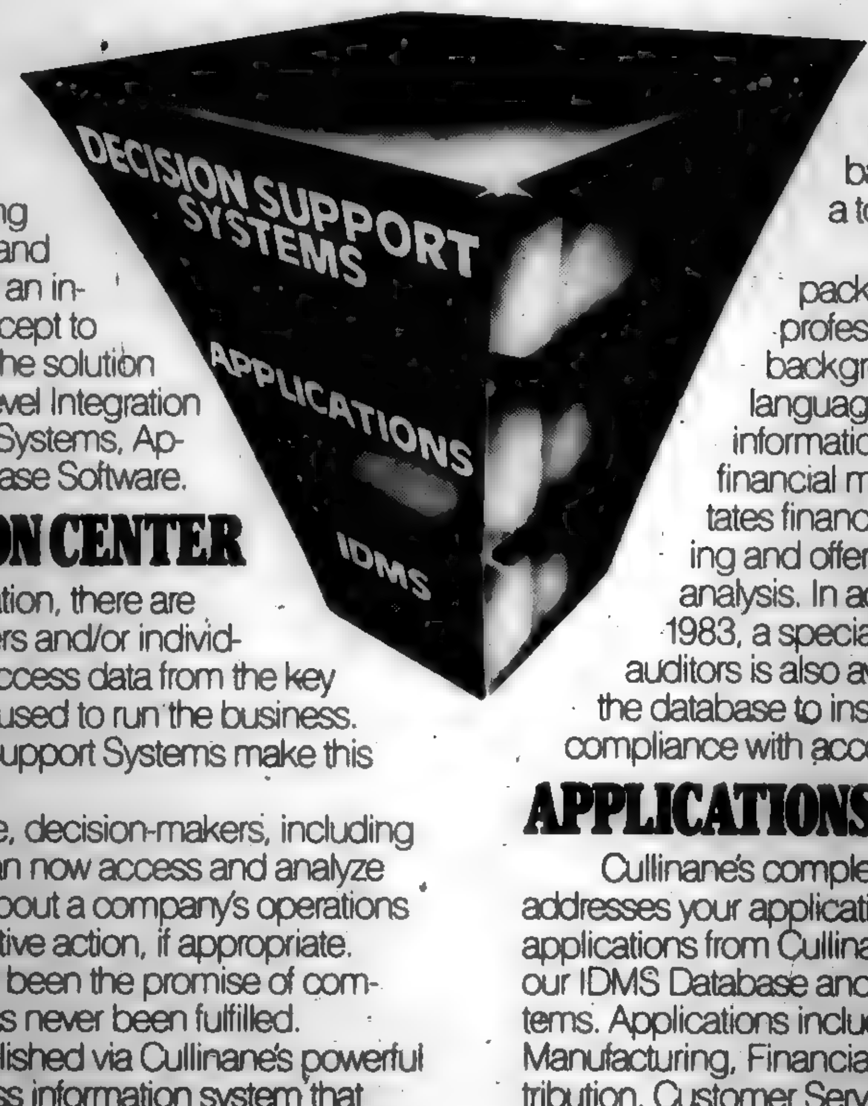
"Three great inventions that have inexorably altered our culture are the automobile, the pill and video technology. We are now in a postliterate society where people prefer visual information. We have information delivery systems mating with video technology and computers to process data that is often gathered remotely by sensors, autos that let us travel freely, birth control that allows us to explore alternate lifestyles and information technology that allows our minds to go anywhere. We see not only change, but *choice*."

Moreover, the futurist said, "Today

(Continued on Page 86)

Jack B. Rochester is the editor of Computerworld Extra!

INTRODUCING THE SOLUTION TO YOUR APPLICATION BACKLOG AND INFORMATION CENTER NEEDS.



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Burlington, VT	March 23	Greensboro, NC	January 27
Calgary, ALT	March 16	Hartford, CT	January 11
Charleston, WV	March 3	Houston, TX	January 20
Charlotte, NC	January 12	Indianapolis, IN	February 23
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(Continued from Page 83)

you're seeing a diffusion of all technologies in the home and in the work place."

So what should DP managers be concerned with? "Doing away with themselves," he maintained. "There are going to be no traditional DP management jobs on the planet's surface because everybody's going to have their own computer. The DP manager in the future has to be a consultant on data processing and information processing techniques. He can't be an operator or a priest of a process; he can't be running a religion and be the only one who can read and interpret the instructions."

However, there is a future "for DP managers who help people set up new systems and teach them how to use the information. We've overlooked the obvious with the computer resource: We just can't employ that many people. First of all, they're not talking to each other enough. Secondly, the half-life of their knowledge occurs in five to 7½ years. They need to be upgraded in new skills. We just can't do it.

"We've got to let people gather and process and store their own information. We've always thought we could solve our problems with a large computer uniquely tailored to our idiosyncratic way of doing business. But that fine-tuning and customizing is ego-driven, not driven by business necessity. There are thousands of Cuisinarts out there, and we all use them differently."

But with almost weekly reports telling us that personal computers, fourth-generation languages and end-user-driven computing are proliferating, aren't we moving away from centralized data processing?

"What we're doing in most of our projects today is just high-teching the existing office, which means we're forcing the workers into using equipment they don't like," Koehn said. "To me, the approach should be work, worker, work place. We invent the work place after we know what

(Continued on Page 88)

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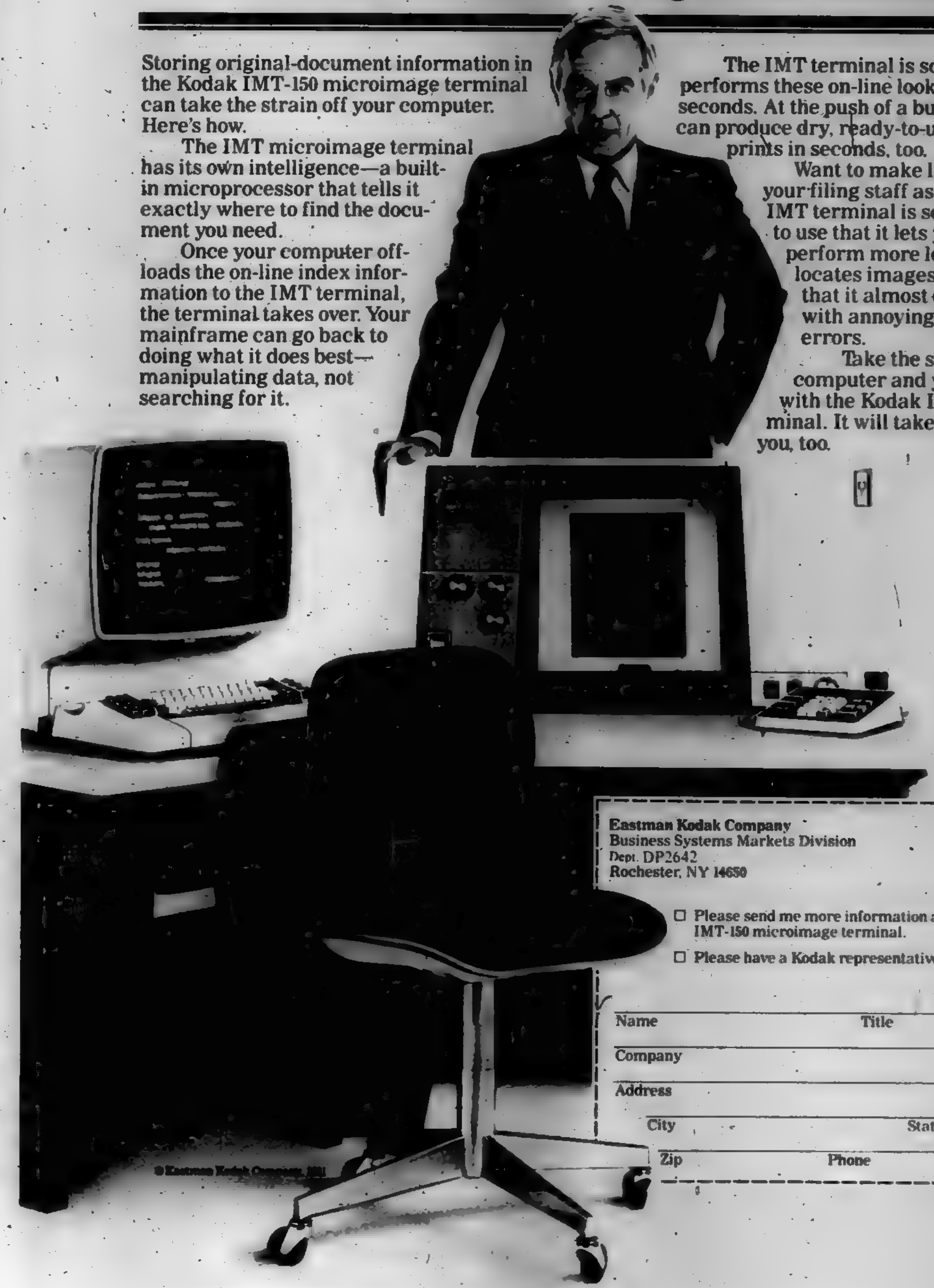

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(Continued from Page 86)

the work is and what the worker is like.

"The key to office automation is so simple and so obvious that it's overlooked by technically oriented people. What's the nature of the venture? What are your services going to be, what kind of information will you need, what are you going to be doing five to 10 years out?"

Isn't this why we have information-resource management, data base management systems, decision support systems?

"Fresh information is a form of power, and combining historical information into new meanings is a form of power," Koehn replied. "But historical data stored by categories or alphabetically, to me, is not a form of power. The power comes from recognizing a unique element or recombining the historical element into a unique element. Information per se is useless.

"Look at the last elections. It used to be very exciting when they started gathering data about who was going to win. Here in California, the predictions in the last 48 hours were that one candidate would be elected governor. What the systems overlooked was that in the last 48 to 72 hours, the other candidate blitzed the media with his image on TV and gained a higher recognition factor. And he won.

"Competitive edges are based more on intuition and impressions. People remember things that are unique. Those things are rarely in a data processing information storage system. Often, we don't know what to collect, so we collect everything. The next evil is we don't have any courage about what to throw away or ignore."

The three Cs — continuity, change and choice — are the elements that will help us prepare ourselves for the future, according to Koehn. "We have images even when we don't think we do. But we have an image from something of the past, which is the reason we reject the change. We have a vague image of the future that allows us to accept and shape the change.

"Here at Security, we publish an internal newsletter called 'Future Scan' where we try to bring all that together and try to interpret it. Then we share it with the rest of the staff — and that means from the grass roots to the president of the bank.

"Recently, we did a scenario called 'Pacific Rim 2010' (see story above) which was an attempt at producing a possible, highly probable, view of an alternate society.

"It's a terrible thing when you are dealing with the future," he added. "The only person who understood the era we're getting into was Marshall McLuhan. When he said the medium is the message, no one really understood him. He saw the future at a time when other people didn't realize that he had a good image of it.

"You can describe a doorway, a change, to someone, but unless you can open the door at the right time, society won't be ready to pass through it. The thing we must remember is that we are inventing our future by our own choice." ■

PACIFIC RIM 2010: One Scenario

The following 'memo' was prepared by Hank Koehn and his staff as a vision of the future, based on their work and research. It was circulated in September and quickly garnered interest from many people outside the bank — including people at the East-West Center, mentioned in the scenario. As a result, the East-West Center is planning a high-level conference in 1983 to explore ways to make Pacrim 2010 a reality.

Date: September 24, 2010.

Place: That region of our planet known as the Pacific Rim.

Fifty years ago, in the year 1960, a geologist described the Pacific Rim as a "halo of energy," referring to the volcanoes that circle the Rim. It was a narrow but perhaps appropriate description.

Today, in 2010, the energy that gives the Pacific Rim its cohesiveness and vibrancy flows not from molten rock and steam, but from the presence of a vast, powerful and interconnected economic and cultural community containing 4.5 billion people — over half the global population.

Technological advances in communications and transportation — especially in the years between 1990 and 2005 — have reduced the barriers of time and distance within the Pacific Rim region and made possible the lively and profitable exchange of ideas and commodities that today so profoundly shape our lives.

The Los Angeles Metroplex is the center of the Rim's financial community, functioning as an electronic nerve center for a multitude of transnational services — electronic funds transfer, trade finance, currency risk management, global funds management. L.A. Metroplex's 11-year-old offshore banking facility is now housed in the newly erected Chinatown Financial Center.

The enthusiastic support and widespread participation by so many Pacific Rim countries in the activities of the University of Hawaii's East-West Center, which has emerged as the Pacific Rim's clearinghouse, led in 1993 to the establishment of the Pacific Rim Transnational Community (PRTC). The first project of the PRTC was the financing and launching of the Pacrim I satellite, whose capabilities included:

- Multinational/multiterminal user transparency.
- Full transmission encryption protection services.
- Value-added services for small users.
- Wideband digital services.
- Video teleconferencing.
- High-speed data and facsimile transmission and electronic mail.
- Individuals-in-transit services.
- Circuit and packet-switched data-based access.
- Store-and-forward service.

Pacrim II was launched by the Japan Space Transport Authority in 1999.

The Pacific Rim Transnational Community executive conferences are routinely conducted via the Pacrim satellite, whose facilities are based at the East-West Center in Honolulu. A recent article in the multilingual *Trans Pacific Times* stated, quite accurately, that the center had become the Rim's philosophical and cultural home. But if the Rim's heart is in Hawaii, one would have to say its mind resides in the vast data banks of the L.A. Metroplex. These computer software systems, which offer everything from crisis management and political risk analysis to currency forecasting and macroeconomic modeling, are instantly accessible to any and all of the Pacrim governments.

The issue of transborder data flow regulation was resolved five years ago in 2005, with the decision to have unrestricted flow of all electronic business data across the region's national borders.

The citizen of the Pacific Rim possesses a consciousness of community that has been shaped by technology, trade and history. An openness to new ideas, coupled with the richness and diversity of the natural and human resources of the Rim, has given them, in the year 2010, a regional neighborhood second to none. ■

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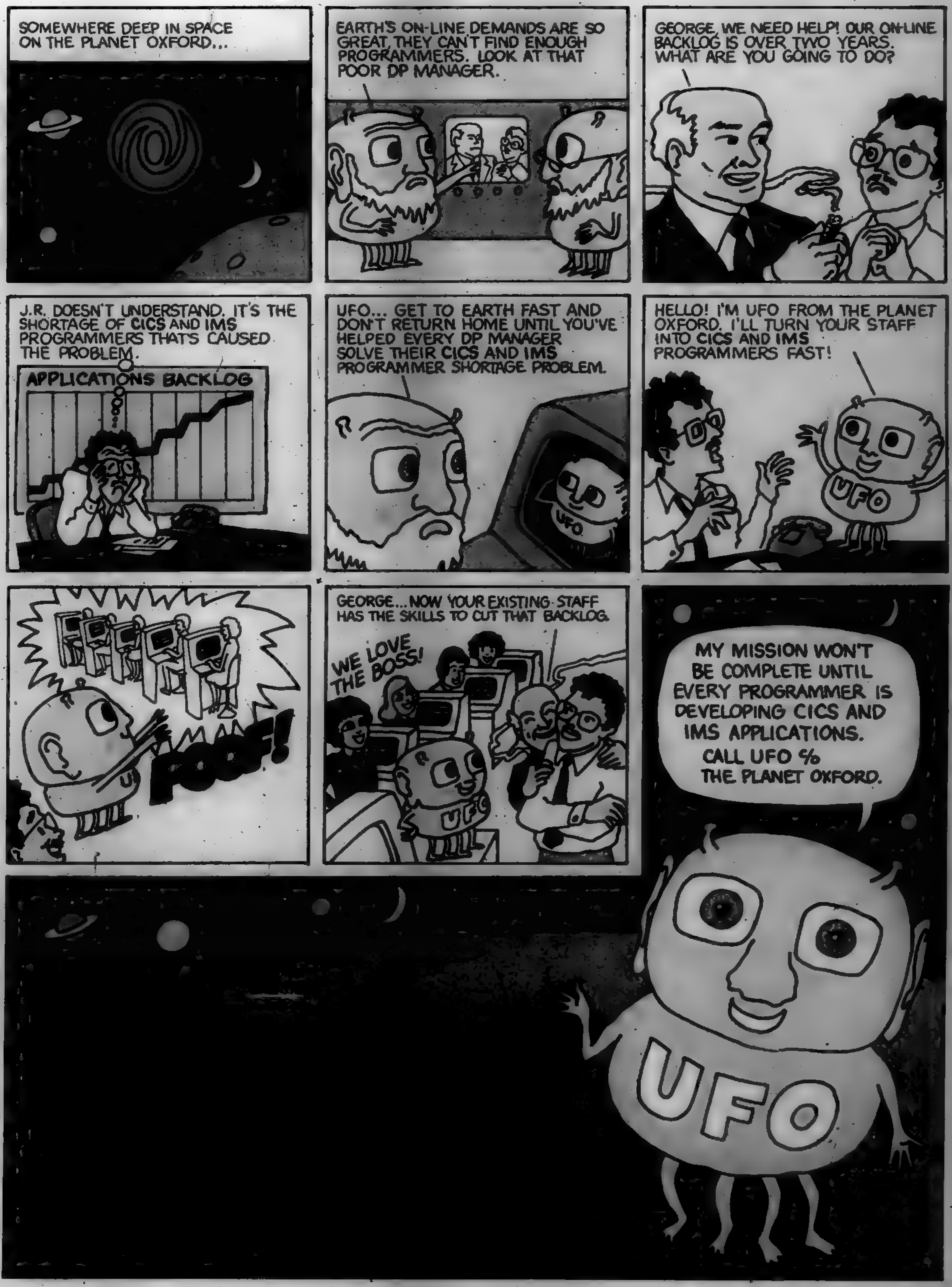
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J.R. DOESN'T UNDERSTAND. IT'S THE SHORTAGE OF CICS AND IMS PROGRAMMERS THAT'S CAUSED THE PROBLEM.
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EDITORIAL

Roll the Dice

Forecasting the future is one huge gamble, and we take this opportunity at the end of each year to place our bets.

The editorial staff of *Computerworld* has devoted weeks to researching and writing the stories in this Forecast '83 issue. Our objective has been not to predict specific events, but only to suggest the forces that are likely to shape the computer industry and affect data processing management next year.

Many of those forces are economic. For example, the recession in the U.S. is lingering and will clearly influence corporate operations and DP decisions next year. While inflation and interest rates are down, the federal deficit, unemployment and business failures are at post-Depression highs. Some economists see no upturn until 1984, an election year.

But the recession is worldwide, and as we are inextricably linked to the rest of the world economically, so we are joined technologically. Networks bounce data around the globe, technological developments no longer are confined to a single country and applications of computer technology can be found in almost every country. Computer technology is becoming a new form of international currency — it is bought, sold, traded, even stolen. The technological fabric is international and interdependent, and we have become one computer world.

From this perspective, 1983 promises to be an eventful year. Many will watch the two bellwethers — IBM and AT&T — which, free of government shackles, are reorganizing and taking a more aggressive posture in the worldwide computing and communications marketplaces. Together, they will set much of the tone of our industry next year.

Individual DP departments will be affected by the actions of those two companies, but they will also feel other strong winds of change. Chief among them are end-user computing and the pervasive use of microcomputers. Many DP shops have been buffeted by these changes and successfully addressed them; those that have not cannot remain immune.

Within this issue you'll find articles that explore these and other topics. We are betting that they will be the major factors in 1983 and the ones with which all of us must contend. Roll the dice.

DATA PAST

Five Years Ago
Dec. 26, 1977/Jan. 2, 1978

WASHINGTON, D.C. — Equifax Services, Inc., which developed reports about the personal lives of about 20 million Americans every year, used "unfair and deceptive" practices in developing and disseminating that information, a Federal Trade Commission judge ruled here.

The information collected and sold became part of millions of computerized files used by the firm's business and government clients.

— — —

HARRISON, N.Y. — A different kind of business conference took place at the headquarters of Texaco, Inc. here. The conference was held via satellite to resolve a "typical business problem" and it included participants in Harrison and in Houston.

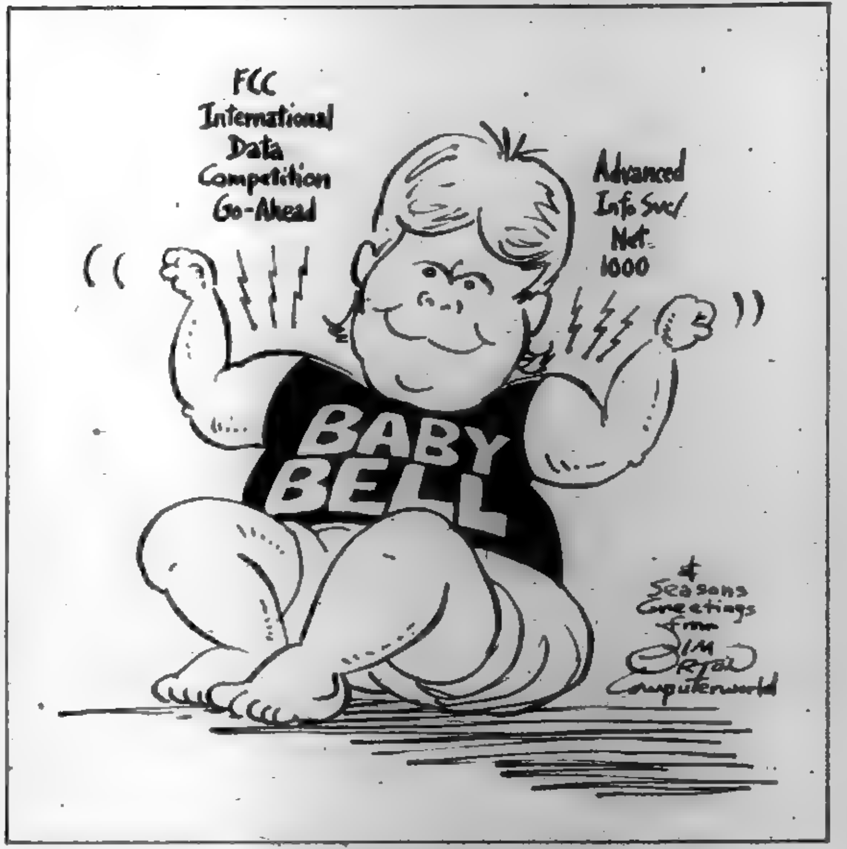
Ten Years Ago
Dec. 27, 1972/Jan. 3, 1973

BOSTON — "One of the first if not the first" citizens' review-type panels to oversee privacy considerations in police information systems was sworn in here by former Gov. Frances W. Sargent.

The Massachusetts Privacy and Security Council was to consider whether the state's police agencies should tie into the Federal Bureau of Investigation's Computerized Criminal History System.

— — —

WASHINGTON, D.C. — The American National Standards Institute released a proposed character set for handprinting and the public had 3½ months to comment on the proposal before it was voted on. The purpose was to avoid ambiguity.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BABY BELL
Seasons Greetings from JIM
Computerworld

Flexing His Muscles

LETTERS

Implement Basic Controls

The editorial "Computer Crime Skeletons" [CW, Nov. 29] argues that organizations suffering losses from computer-assisted crime should aggressively support the public reporting and prosecution of these thefts. That position is not novel; it is quite commonly found in all types of organizations that have not yet, or not recently, suffered major losses through fraud or embezzlement.

The argument that thieves should be punished cannot be challenged in the abstract. It is only when we encounter specific cases that we find room for the frequent exceptions against which *Computerworld* argues.

Should an organization pursue prosecution of a thief if there is no firm assurance that the prosecutor will be equally enthusiastic, if the stolen funds will not be recovered, if the resulting publicity describes a little-known system defect that costs more to fix than will, in all probability, be stolen through it without that publicity and if customers, stockholders, policyholders, voters or depositors will lose faith in the management and take retribution for the seeming management failure?

Surely, most of us agree that people who break rules should be punished, but we should not insist on the blind application of these beliefs when that application will impose a greater injustice on those already offended against.

In the case of white-collar crime, *Computerworld* is wholly without data to support its argument that increased punishment will have a deterrent effect on others.

Similarly, *Computerworld* has no basis for the contention that attempts to punish thieves using computers will in some way assist those who want to secure data and the means of processing it.

The editorial implies that somehow fewer white-collar crimes are reported if they involve computers than if they do not. There is no data to support that position. I believe it not to be true.

Many of the people responsible for the management of DP facilities have not yet taken the most basic steps to secure their data.

They do not need information provided by attempts at prosecution, as the editorial suggests. It is not the case that DP directors have protected their data against all of the problems they are aware of and now need only to hear of some more offenses and how they happened to add to their list of already-implemented security measures.

Today, many firms allow large numbers of geographically dispersed people access to their DP resources and then hold none of them specifically and individually accountable for his actions. The firms are then forced to trust in the honesty and integrity of the people who have been assured complete and continuing anonymity while they do whatever can be done from the terminals. This situation not only invites dishonesty, it unfairly exposes to suspicion honest people using the same systems.

The basic controls needed to thwart most potentially dishonest employees with access to DP resources are well known. We're better advised to implement these measures than to prosecute everybody who succumbs to temptations to which they were unnecessarily exposed.

I, too, abhor criminal conduct, but not so much that I can be persuaded to embrace blindly intuitively derived measures of unproven efficacy and fairness.

Robert H. Courtney Jr.
President
Robert Courtney, Inc.
Port Ewen, N.Y.

THE DATA CENTER/John P. Murray‡

Don't Stall Too Many 'One-Trick Ponies'

> *'It should be clear that those circumstances within an organization that encourage the development and maintenance of a one-trick pony — or, worse yet, a stable of one-trick ponies — do not, in the long term, benefit either the individual or the organization.'*

Paul Simon, in his song, *One Trick Pony*, has produced a message that applies to some of us in the data processing profession. The song tells the story of a good, indeed a very good, though limited, talent. There are, unfortunately, any number of examples of what might be called the "one-trick pony syndrome" in data processing.

The phenomenon can be observed in a number of DP departments. Many of us are familiar with, may in fact be, someone who has fallen victim to this malady. Often, this has come about as a result of an unwillingness to take charge of circumstances, a propensity simply to drift along with events.

People who find themselves in such a situation are often referred to as "specialists." While the title may be impressive, often the result is to become locked into a very narrow, confining role.

The specialists are usually programmers or analysts who have spent considerable time working exclusively on one, or perhaps two, specific systems within the organization. Some of the common systems examples are payroll, billing, claims processing or, perhaps, general ledger.

The criteria generally associated with systems under the purview of a specialist are that they be large, often complex and, almost always, critical to the ongoing health of the organization in question.

The specialist usually possesses such intimate knowledge of both the individual programs and the entire system that he can explain, often without consulting the code, where to make changes in order to effect desired results.

High-Quality Results

No question about it, the results produced by the specialist are often of high quality!

In many instances, a complex, comprehensive system runs well, is often enhanced or modified with relative ease and the clients are, by and large, satisfied.

Questions of organizational responsibility (does the specialist work for DP or for payroll?) may arise, but these are resolved in one manner or another.

Often, the specialist ends up assigned to the management information systems (MIS) department, but reports to the manager of the department responsible for the system that the specialist maintains.

Over time, the system becomes the sole province of the specialist. No one else would, in many instances no one else could, make changes to the system without the guidance of the specialist.

Is such a situation good? Does it really benefit either the individual or the organization? The long-term answer must, of course, be "No!"

While it may well be that a person in such a position derives a reasonable amount of psychic reward and job security from such an arrangement and while the organization gains an experienced person who has mastered what may be a difficult system and who can effect changes in a very short time and in a safe fashion, there are inherent disadvantages to both the individual and the organization in any arrangement such as this one.

In such a situation, the specialist will, over time, often find that the technical world has begun to pass him by.

Often, his system, once it is up and operating correctly, will continue with the same basic technology for a considerable length of time.

While the rest of the industry has moved to new access methods, on-line processing and data bases, the specialist may still be working with his autocode system.

Questions Still Remain

While satisfaction can be gained, should be gained, from doing a job well, these questions still remain:

- How much satisfaction can be gained from working with dying technology?
- Where in these circumstances are the challenges, the opportunities to learn and grow?
- Is the one-trick pony cloistered in his stall, being bypassed by the industry?

The answer, more often than not, is, "Of course!"

Conversely, the organization does not gain as much from such a situation as it might be assumed.

It is correct that members of management and both MIS and the department that uses the particular system can rest somewhat more easily knowing the specialist can be counted on to perform, often with consummate skill, his one trick.

False Sense of Security

Often, however, this creates a false sense of security. Because the job is being done, the requirement for adequate backup is overlooked or put off. This can prove to be fatal.

What happens when the specialist is unavailable?

Management can be rather certain that documentation, if any exists, will not be sufficient to provide any guide to solving the current problem. It will be found that any condition that removes the specialist from direct involvement with the system will translate into difficulty.

It should be clear that those circumstances within an organization that encourage the development and maintenance of a one-trick pony — or, worse yet, a stable of one-trick ponies — do not, in the long term, benefit either the individual or the organization.

Resolution of the problem does not rest entirely with either the individual or the organization.

The specialist must recognize the existence of, and work to free himself from, the shackles (golden handcuffs) represented by his total commitment and understanding of the particular system for which he has responsibility.

The organization or, more appropriately, the management of the DP department, must work to encourage the specialist to train someone else to become familiar with the system.

The specialist must also be encouraged to seek new areas within the department where he can learn and grow; he must be helped to realize the requirement to broaden his horizons.

As this develops, one caution should be observed. If a reasonably

(Continued on Page 92)

HUMAN CONNECTION /Jack Stone‡

Warning: The Unemployment Malaise Is Just Around the Corner From DP

Isn't it wonderful being in this great business, where jobs are plentiful and long-term security abounds? Of course, all of us are aware of the difficult times that those without DP skills are having. And I don't just mean the typical factory workers, but teachers, lawyers, economists, sociologists and other professionals.

As you probably know, hiring has come to a virtual standstill around the country except for individuals with talents in short supply, namely, those in data processing and those with such distinguished specialties as hamburger tossing.

The reason, of course, is unemployment malaise, the insidious form of economic cancer that is spreading throughout business and government organizations and casting a lurid pall over prospects for growth.

Beware of the Sickness

It's not my way to be a pessimist, but this has to be said: beware of the sickness, dear reader, because it may be coming closer and closer to your home. I know this because it's just around the corner from mine.

A few months ago, a good friend, an independent consultant who probably is the best urban planner in Washington, D.C., received a phone call from his federal government customer announcing the immediate termination of his long-term contract. No notice, no reason, no settlement, no nothing.

Being used to a standard of living consistent with a $40,000 annual income (my guess), he moved with alacrity to land another contract, sending proposals all over the city. The results were a universally cold shoulder: There were no new urban development programs, or plans for any, and no end-of-fiscal-year-funding to boot. So he gave up the search until after the first of the year and decided to renovate his condo apartment instead.

Saga of a WP Firm

Then there's the saga of a small word processing services firm, a consulting client of mine, whose staff numbered 35 last January and is now at six and still going down. One who was dropped from the roster had this to say about the experience:

"I suppose we all knew the layoff was rapidly approaching, but we chose to ignore it. After all, the firm had been around for over a quarter century. I was with it for nearly four years, and I figured that, one way or another, it would bail itself out. One Friday, I walked into the office, heard the announcement, was given a final check and was handed my walking papers. I was stunned, I was angry, I was frustrated.

"For me, the mere idea of looking for a job is a wrenching experience, even though I have a marketable set of word processing skills, including manuscript editing and word processing training. At least I thought I did. Then I began contacting employment agencies that specialize in word processing.

"First off, the agency contacts were Neanderthals who hadn't the slightest idea what goes on in word processing; their capabilities were limited to the repeating of job specs. But there were plenty of jobs: entry-level word processing text-entry positions paying an absurd hourly rate of $8, well below what I was used to earning.

"I was distressed about my situation. Then I stood in my first line to wait for an unemployment check; I became really depressed.

"Luckily, a friend led me to some part-time work that, along with unemployment checks, should tide me over until I find a permanent slot.

"Don't try a layoff — you won't like it."

Letters to Stone should be addressed to him at Box 270, 1377 K St. N.W., Washington, D.C. 20005.

LETTERS

Far Too Kind

N. Chapman and J. Tricebock have been far, far too kind to the user community in their reader commentary "Real Users Always Must Get a Cup of Coffee" [CW, Nov. 29]. I propose to remedy that condition with the following list:

- Real Users know structured walk-throughs are really structured crucifixions of the analyst.
- Real Users always wear jackets at meetings (even when the air conditioning malfunctions).
- Real Users catch the typos in the requirements documents and list each one in their comments.
- Real Users save all major system changes until programming is almost complete.
- Real Users believe professionals don't get on terminals.
- Real Users get hands-on DP experience through Pac Man games.
- Real Users believe tape can be used as a direct access device.
- Real Users respond to analysts' questions two weeks after the spec is written.
- Real Users believe system crashes are cop-outs.
- Real Users are adept at assigning blame to the project leader.
- Real Users are even more adept at accepting the credit for the project leader's ideas.
- Real Users say they have read the system documents, then ask questions that show they haven't.
- Real Users have read *Winning Through Intimidation* — twice.

P.S. I'm tempted to become a Real User. Real Users always get promoted and the job pays very well.

Christine Joseph
Systems Analyst
Software Design Associates
Philadelphia, Pa.

Toward Professionalism

I thought we came a long way toward professionalism with the certification in data processing and, more recently, with Data Processing Management Association's code of ethics, standards of conduct and enforcement procedures.

The forgers of these representations of professionalism were apparently off the mark, according to Bill Kalafus' letter to the editor [CW, Nov. 8]. What seems to be a better representation is a Wednesday afternoon golf game, long weekends and several vacations during the year.

I assume that Kalafus is not self-employed and that he works within the field of data processing. This being the case, he can satisfy his gripe by changing jobs, his employer or he can change his profession.

J.E. Sands
Manager
Business Systems Development
Carpenter Technology Corp.
Reading, Pa.

Use the SEARCH Verb

The two instructions formulated in Ahmnad Ahmadi's letter to the editor on table search method [CW, Oct. 4] — "Have I reached the end of the table?" and "Have I found the item I am looking for?" — are facilitated by using the Cobol SEARCH verb, in conjunction with the AT END and WHEN clauses.

In addition to this, proper SEARCH usage does not require an IF check upon completion of the search procedure to determine the success of the search, as in Ahmadi's example.

Lastly, the search procedure Ahmadi describes doubles the maintenance requirement. Not only does the OCCURS clause require altering, but the IF check must be modified with each table size change.

The alteration of the OCCURS clause assumed above requires n elements in an n-size table (or n + 1 in the Ahmadi construct). This assumption eliminates a table size greater than n (or n + 1) and is consistent with Ahmadi's concern to increase production considerably.

Usage of the SEARCH verb reduces maintenance, allows for the minimal number of table entries and optimizes search time.

J.R. Schofield Jr.
Albuquerque, N.M.

Limited Talent Not Beneficial

(Continued from Page 91)

good job has been done by the specialist, a strong rapport will have developed between him and members of the department that uses the system for which he has responsibility. When the clients learn that their specialist will no longer be instantly available to help solve their problems, difficulty can be expected. Both the specialist and the management of the DP department must be willing to ride out the storm.

Our industry changes too rapidly. There are simply too many challenges and too many existing opportunities to allow anyone to become locked into a narrow role.

No one should, after several years of effort, look up and find he has become a one-trick pony. Both groups involved here, individuals and DP management, must work to ensure this does not happen!

Murray is director of management information services for Ray-O-Vac Corp., Madison, Wis. He is responsible for worldwide MIS activities. Murray has 20 years of DP experience, 10 of which have been devoted to the management of data centers.

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CW-12/27

The customer service software people

CICS Offered For Mark 3000

ROCKVILLE, Md. — General Electric Information Services Co. (Geisco) will offer IBM's CICS transaction processing monitor on its IBM-compatible Mark 3000 time-sharing service.

Geisco's teleprocessing network will allow customers to use CICS in multiple locations and in combination with data base managers such as IBM's IMS, according to a spokesman for the firm.

Geisco consultants and programmers are available for assistance in application development, the spokesman added.

The CICS service costs 80 cent/computer resource unit.

Geisco is headquartered at 401 N. Washington St., Rockville, Md. 20850.

CICS Gets Security Tool

FALLS CHURCH, Va. — Tech Products, Inc. has announced a general-purpose security system for IBM's CICS on-line monitor.

Called CICS-Protect, the package is said to provide security under any hierarchy desired. An audit trail of all security checking and attempted violations can be maintained, a spokesman said. No I/O operations are required for security checking.

The package is written in assembler and is capable of handling up to 32,000 keys. Cost ranges from $3,850 to $12,650 from Tech Products at 7700 Leesburg Pike, Falls Church, Va. 22042.

Venix-Based Tools Out For VAX-11s, PDP-11s

CAMBRIDGE, Mass. — Venturcom, Inc. has announced a series of software packages for Digital Equipment Corp. VAX-11 and PDP-11 computers as well as for microcomputers based on Intel Corp.'s 8086 microprocessor.

Venix is an enhanced version of Bell Laboratories' Unix operating system geared for scientific applications. Features include asynchronous I/O, shared data memory and semaphores and a real-time priority class. The package has multiuser, time-shared capability, a spokesman said, and includes electronic mail and virtual terminal emulation.

Application development tools on Venix include C, Fortran 77 and Pascal languages, two screen editors and a command interpreter and debugger. Multiuser support with background processing and code-mapping is featured, the spokesman said. Venix for the PDP 11/23 costs $2,400.

The company also announced a series of Venix-compatible application programs.

The Final Word is called an interactive, full-screen word processor. Windowing allows multiple documents to be edited simultaneously. Automatic tracking, highlight printing and proportional spacing are standard. An 11/23 version costs $650.

Logix is a relational data base management system that allows the user to create and edit data and query selected items using English-like syntax, the spokesman said. Logix supports six data types including text, money and duration and costs $3,500 for the 11/23 and 11/34 versions; $6,000 on 11/70s.

TEQ was designed to evaluate mathematical functions interactively. The package can evaluate differential equations, compute finite integrals, locate function zeroes and plot functions, the spokesman said. The cost is $295 for an 11/23 version.

Sigpak is a signal processing package for speech, biomedical and seismic analysis or any application involving time-series data. Waveform and Emacs screen editors are featured. Sigpak provides data structures, protocols and runtime routines, the spokesman said. The package costs $5,000 on the 11/23.

Proforms is a time and billing package for service firms. Functions include invoice preparation, accounts receivable, individual contributions and project management information reporting. An 11/23 version

(Continued on Page 94)

For OS, DOS Environments

ADR/Look Gets Major Enhancements

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) has announced major enhancements to ADR/Look, a performance monitor for tuning, diagnosis and trend analysis of IBM OS and DOS operating system environments.

Under Release 6.2 for OS environments, the CICS monitor displays file activity for files including Vsam, non-Vsam and DL/1 data sets, a spokesman said. The release features an option to display load and entry point addresses of active modules. A new option to the control block command reports on the number of free data set control blocks in Vtoc.

Look's threshold monitor now captures additional information on system I/O. The performance analyzer had been enhanced to include the domain contention index, the current multiprogramming level and extended real memory activity for MVS/SP 1.3 users, the spokesman said.

Release 2.2 of Look for DOS/VS(E)/SSX environments reportedly includes a CICS monitor, ability to access Look from ADR's Datacom/DC teleprocessing monitor and real-time graphics. A facility called Zap allows users to modify memory on-line, the spokesman claimed. Look commands can be secured through passwords and by user identification.

The permanent license fee for Look starts at $7,000 for OS, $5,500 for DOS and $4,100 for low-end 4300 and 370 products from ADR at Rt. 206 & Orchard Road, CN-8, Princeton, N.J. 08540.

Tool Said to Simulate CP/M On DG CPUs Running AOS

BERKELEY, Calif. — Virtual Microsystems has announced a software package said to simulate Digital Research, Inc.'s CP/M operating system on Data General Corp. computers running AOS or AOS/VS.

Called The Bridge, the product loads like an application program on an Eclipse computer and builds a 56K-byte CP/M environment. Operation is similar to a personal computer, the company claimed, allowing use of all CP/M applications. The user has access to resident files on the host system and file interchange between users is provided.

The package includes utilities which allow DG users to transfer CP/M files to and from DG's AOS or AOS/VS file systems. The Bridge costs $3,500 from Suite 720, 2150 Shattuck Ave., Berkeley, Calif. 94704.

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Composed of 28 Separate Modules

Version of 'Model' Available for Prime CPUs

NATICK, Mass. — Prime Computer, Inc. has announced that a version of Lloyd Bush and Associates' Model interactive financial modeling and decision support system is available for Prime computers.

The Prime version of Model is composed of 28 separately priced modules designed to address business applications including budgeting, manpower planning, corporate modeling, merger/acquisition studies and project scheduling, a Prime spokeswoman said.

The entry-level package, priced at $9,000, includes basic budgeting and planning and the production of pro forma statements. The package includes a What If subsystem that enables the user to evaluate various model assumptions and a read/write feature for accessing data in external files.

A report writer produces standard templates and customized reports; a trace feature performs on-line editing; and a Help facility explains commands and error messages.

Lloyd Bush and Associates is located at 156 Williams St., New York, N.Y. 10038.

Prime 'DSS' Gets Printer Graphics

EAST LANSING, Mich. — The Prime Computer, Inc. minicomputer version of Mega Systems, Inc.'s Decision Support System (DSS) now includes a printer graphics module.

The module is said to provide graphics representation of data without requiring additional specialized hardware. The module offers 14 different varieties of bar, line and pie charts.

An overlay option allows the combination of bar and line graphs within a single graph presentation, according to the vendor.

Mega DSS Graphics is available as an addition to Mega DSS for $1,000/package licensed to Prime users.

Mega can be reached at P.O. Box 151, East Lansing, Mich. 48823.

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Two Languages, DBMS Designed For C Series

CAMBRIDGE, Mass. — BBN Computer Corp. has announced two business programming languages and a data base management system (DBMS) for its Bell Laboratories' Unix-based C series of minicomputers.

Cdibol is said to be a fully compatible Unix implementation of Digital Equipment Corp.'s CTS-500 Dibol. It allows programs writen in Dibol to run without change or modification on a C machine, the vendor claimed.

A version of Microfocus, Inc.'s Level II Cobol reportedly enables the company's C machines to compile and execute programs written in Ansi '74 Cobol. The package can offload batch-oriented applications from a mainframe system and exploit time-sharing capabilities of Unix and C series systems, the vendor said.

The Informix relational DBMS system is a collection of programs used for building data base applications. The package reportedly features interactive query language report writer software.

Cdibol is priced at $3,000. The business software package, which includes Level II Cobol and Informix, costs $7,500 from BBN at 33 Moulton St., Cambridge, Mass. 02238.

'Books System' Handles Files

CARMEL, Calif. — Crescent Data Systems has announced a bookshop package that integrates various accounting systems and handles 37,000 files.

The Books System runs on Data General Corp. Nova or compatible systems and is available as a packaged configuration with a Point 4 Data Corp. Mark 5 computer.

The Books System includes inventory, cross-reference, purchasing, invoicing and sales functions as well as accounts payable, general ledger and accounts receivable. Auditors can review invoices by data and issue checks accordingly, the company claimed. The entire package was written with Point 4's Force automatic programming system.

The Books System costs $5,000 for the software alone from Crescent Data Systems at 3616 "The Barnyard," Carmel, Calif. 93923.

Venix Offered For DEC CPUs

(Continued from Page 93)

costs $1,500.

Matrix is an electronic spreadsheet system for decision support. Features include simple and complex depreciation and amortization, linear and polynomial curve fitting, risk analysis, forecasting and goal-seeking, the spokesman said. Cost is $325 on an 11/23.

The spokesman said that Zilog Corp. Z80 native C and C cross compilers are available for $150 each. Venturcom is located at 139 Main St., Cambridge, Mass. 02142.

'UCC Ten Data Dictionary' Backs IMS/VS Release 1.2

DALLAS — University Computing Company (UCC) has expanded its UCC Ten Data Dictionary/Manager to provide support for IBM's IMS/VS Release 1.2. Included is support for the data sharing feature, Message Format Service, extended attributes and support for 3375 and 3380 storage devices.

Expanded keyword facilities allow predefinition of keywords by entity, selection of entity attributes and keyword control by "side," a spokesman said. All editing and security checking have been consolidated into one module. Additional features include dynamic allocation, nonstructured entity delete option, improved copy commands, queued transaction selection and improved installation techniques, the spokesman said.

The package costs $24,000 from UCC at UCC Tower, Exchange Park, Dallas, Texas 75235.

Program Tools For 'Nonstop' Offered Free

CUPERTINO, Calif. — As part of its semiannual software release that is free to current users, Tandem Computers, Inc. has announced program development tools for Tandem Nonstop computer users.

The three tools — Inspect, Binder and Crossref — are said to provide users with a comprehensive environment for development, testing and maintenance of programs written in Cobol, Fortran, the firm's TAL language and Screen Cobol.

Inspect is a symbolic debugging tool; Binder is a linkage editor said to manage and manipulate object program files; and Crossref reportedly provides a multilingual source program cross-reference facility.

Tandem is headquartered at 19333 Vallco Pkwy., Cupertino, Calif. 95014.

Support System Cuts Audit Time

NEW YORK — Peat, Marwick, Mitchell & Co. has announced a computerized audit support system that, when fully implemented, is expected to reduce the time required to complete audits by 10% or more.

The new system is called System Evaluation Approach — Computerized Audit Support (Seacas). The early phases of the system will do many of the tasks that previously had to be done manually, the accounting firm said. The system will be used in varying degress for all clients regardless of size or industry.

Further details on the new service are available from Peat, Marwick, Mitchell & Co. at 345 Park Ave., New York, N.Y. 10154.

Productivity Tools Out for RSTS Users

FREDERICTON, N.B. — A family of programmer productivity tools for Digital Equipment Corp. RSTS users is available from Solutions Deck.

The product is called Solutions Deck and it includes preprocessors to aid in producing report, inquiry, master and transaction programs. Taking advantage of the similarities among programs of the same type, the series is said to produce greater than 90% of the code required.

Solutions Deck supports the use of DEC's Basic+2 and RMS-11 if desired, the vendor said. Introductory prices are all under $800 from the firm through P.O. Box 684, Postal Station A, Fredericton, New Brunswick, E3B 5B4, Canada.

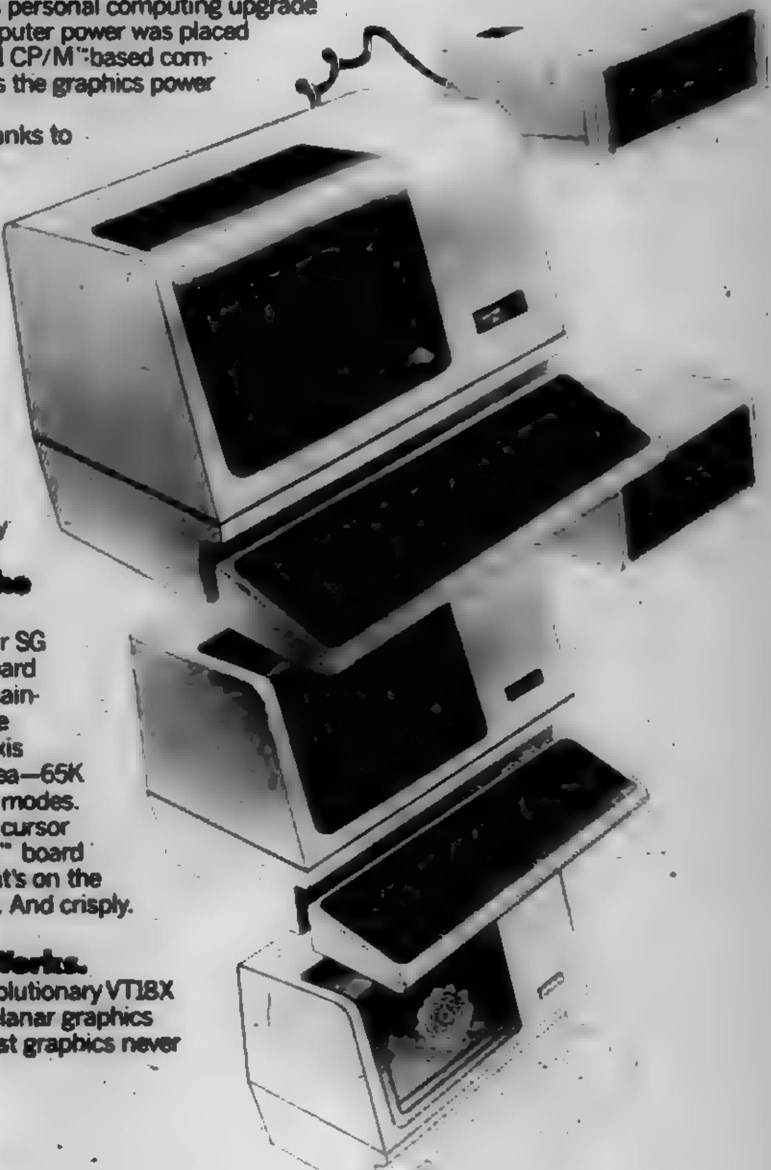
Nonvirtual Computer Users Get Customized Graphics Applications

WASHINGTON, D.C. — Decision Resources, Inc. has announced a series of customized graphics applications for users of nonvirtual computers, including machines made by Sperry Univac, Control Data Corp., Honeywell, Inc. and Burroughs Corp.; and IBM computers running CMS and MVS.

Available custom features reportedly include a mixed-mode user interface that provides step-by-step menu access to interactive graphics, a command mode access for experienced users, a standard library of user-modifiable charts and/or maps and direct access linkages to data stored in a variety of data base management systems, the vendor said.

A spokeswoman said other features allow users to design graphics on micro- or minicomputers and transmit them to a mainframe and to develop word charts using communicating word processing equipment.

A full package that is operating system-independent includes connection to data bases, standardized chart format, library, multiple Help facility and variable mode access. It costs $30,000 from the firm at 1701 K St. N.W., Third Floor, Washington, D.C. 20006.



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Micro Notes

Zentec Corp. has announced a Microfocus, Inc. Level II **Cobol compiler** for its Series 2000 microcomputer. The compiler is said to permit any program written in Ansi '74 Cobol to run on the Series 2000. At the same time, the company released two utilities for Level II Cobol.

The enhancement permits interactive screen-handling, line-sequential file handling and run-time specifications of external file and program names, the vendor said. Support packages include screen input and output, multikey, indexed-sequential file handling capabilities and a library of run-time subroutines.

The **Microfocus Forms-2** utility permits data entry forms to be painted on the screen, a spokesman said. The **Microfocus Animator** debugging utility displays source code and allows the programmer to flag breakpoints with a cursor.

The Cobol compiler costs $1,600, Animator costs $800 and Forms-2 costs $200 from Zentec at 2400 Walsh Ave., Santa Clara, Calif. 95050.

A data base management software package for Digital Research, Inc. CP/M-based microcomputers has been announced by New Era Technologies, Inc. **Microcomputer Information Support Tools 2.0** reportedly provides access to networking tools needed for data base management, telecommunications, word processing and remote access. The software costs $1,500 from the firm at Suite 924, 2025 Eye St. N.W., Washington, D.C. 20006.

A project management system for Radio Shack TRS-80 Models II, III and 16 and Digital Research, Inc. CP/M-based systems has been announced by Institute for Scientific Analysis, Inc.

The modularized, menu-driven **Managemint** uses the Program Evaluation and Review Technique/Critical Path Method (Pert/CPM) approach and tracks schedules, budgets and resources.

The system's files are compatible with the vendor's Super data base management system and may be coupled through Super to a number of word processors, the vendor said. The basic Pert/CPM system costs $395 from the firm through P.O. Box 7186, Wilmington, Del. 19803.

Fortex Systems Corp. has introduced a utility said to allow rapid data transfer from a Winchester hard disk to floppy disks.

Xcopy reportedly includes automatic prompting, which allows the user to continue onto another floppy disk when the previous disk is filled. Preselected files can also be copied automatically, the company claimed. The product also offers the option to obtain directories from any disk and to selectively erase, rename or copy any file chosen.

The package runs on any Digital Research, Inc. CP/M or MP/M-based system with floppy disks and Winchester capability. It costs $99 from 1935 New York Ave., Huntington Station, N.Y. 11746.

Alpha Software Corp. has introduced the **Apple-IBM Connection**, a software package designed to allow information transfer between the Apple Computer, Inc. Apple II and the IBM Personal Computer. Among its advantages is the ability to transfer spreadsheet information running on the Apple to the IBM without rekeying. It is available for $195. More information is available from the vendor at Suite 400, 6 New England Executive Park, Burlington, Mass. 01803.

Visicorp has introduced **Visilink**, a software package that allows users of the spreadsheet program, Visicalc, to transfer data to their personal computer from the world's largest private business data bank from McGraw-Hill, Inc.'s Data Resources, Inc. It is designed to allow easy access to current worldwide economic and business information in a format for immediate Visicalc analysis. It is available for $250. More information is available from the vendor at 2895 Zanker Road, San Jose, Calif. 95134.

Gregg Corp. has introduced **Mainline**, a software program for the Apple II that is said to request and pass information from remote mainframe data bases to the micro via telephone. It is designed to simplify the formatting and transfer of data. It is available for $495 from the vendor at 100 Fifth Ave., Waltham, Mass. 02181.

American Business Systems (ABS) has announced price reductions for its family of microcomputer-based financial software packages. The packages run on systems utilizing Zilog, Inc.'s Z80, Z88 and Z800; Intel Corp.'s 8086; or Motorola, Inc.'s 68000 microprocessors, running under Digital Research, Inc.'s CP/M or MP/M 80 or 86; Phase One Systems, Inc.'s Oasis; or Bell Laboratories' Unix operating systems.

The price for single-user **Financial Accounting Systems** have dropped to $200/module for binary copies. **Business Accounting Control Systems** now cost $1,500 for multiuser source plus one copy of the binary and $500 for binary alone.

ABS is located at 3 Littleton Road, Westford, Mass. 01886.

Vector Graphic, Inc. has introduced the first in a series of software applications packages that automatically creates Vector Graphic Execuplan II financial forecasting models. The **Forecasting Execumodeler** comes with over 40 templates that interact automatically, enabling the user to perform forecasting and modeling for such things as sales, inventory and project management. This product can be used on all Vector Graphic systems, according to a company spokeswoman. It sells for $295, the vendor said from 500 N. Ventu Park Road, Thousand Oaks, Calif. 91320.

A graphics software package intended for Apple Computer, Inc. Apple III users is now available from Software Publishing Corp. **PFS:Graph** can produce bar, line and pie charts for presentations and up to four graphs can be displayed on a single set of axes, the vendor said. It reportedly can also perform automatic formatting, scaling, legend labeling and pattern fill. This product costs $175. The vendor is based at 1901 Landings Drive, Mountain View, Calif. 94043.

Comcrypt is the name of a CP/M-based software package that reportedly combines computer communications with encryption and decryption capabilities. This product operates over regular telephone lines or direct wire between computers and protects against "eavesdropping" on computer communications, the vendor said. Comcrypt requires a Zilog, Inc. Z80 microcomputer using Digital Research, Inc.'s CP/M 2.0 or later and a 24-line by 80-col. terminal. It costs $250 and is available from Century Systems, Inc., Suite 118, 12872 Valley View Ave., Garden Grove, Calif. 92645.

Business Solutions, Inc. has announced **Jack**, a four-application software package for Apple Computer, Inc. Apple II processors.

The package includes a personal filer, calculation software, word processing features and mailing label capabilities. The package allows users to create letters and reports with embedded calculations. Word processing capabilities allow the user to create formatted records. The package can also be used to produce documents that can be automatically calculated as the document is being prepared, the vendor said.

The package costs $79 and is available from the vendor through P.O. Box 341, Kings Park, N.Y. 11754

Finds Five Traits

IDC Study Looks at OA Communications

By Bruce Hoard
CW Staff

FRAMINGHAM, Mass. — There are five major characteristics common to communications in most offices, according to a recent report entitled *Communications Networks in Office Automation* from International Data Corp. (IDC). The five are:

- Multiple sources of information.
- Multiple information-carrying media.
- Full range of sender/receiver permutations.
- Both structured and ad hoc information flows in the same office.
- Frequent physical relocation of individuals.

Multiple sources of information — "Most offices rely on a wide mixture of sources for 'raw material' information," the report said. Some are external, such as trade publications and on-line data bases, while others are internal, such as department or agency files and corporate financial records.

Despite the fact that different individuals in an office are likely to make different uses of those sources, the office as a unit needs to be able to provide access to all relevant sources of information.

Multiple information-carrying media — "Not only does information come to the office from a variety of sources, but it is contained on a number of different media," the study observed.

Usually, written text and voice communications, either face to face or over the telephone are the predominant media, although graphs and numerical data must be considered. In short, the media patterns of particular users are likely to vary as significantly as the sources of information.

Sender/receiver permutations — Peers communicate with each other individually; supervisors issue instructions to groups; group inputs to a project are collected and coordinated by an individual and meetings are held at which individuals send and receive communications to and from more than one other person.

Overall, the patterns of interaction in a given office are unlikely to change radically unless the mission of the office changes, the study noted, adding that that does not mean patterns will remain stable enough to design a rigid office communications network.

Structured and ad hoc information flows — The report noted that some office work is characterized by highly structured, routine information flows. As an example, invoices come in at one end of an accounts payable office, are matched against standard information sources such as purchase orders and shipping documents and then the checks to suppliers flow out the other end.

However, "even the most routine offices have an element of ad hoc, unstructured information flow, and even the most unstructured offices have some very routine information patterns," it continues, urging network designers to plan for exceptional network use.

Physical relocation of individuals — Large-scale office moves are not unusual and even without them, reassignments, retirements and promotions lead to frequent physical location changes within the office. Therefore, the physical configuration of an office automation network must be flexible enough to bend with and accommodate those changes.

The study goes on to say that the physical mobility of office workers is "one of the strongest arguments for the private branch exchange-based local-area network architecture, particularly in old construction, since most offices are wired for telephone service."

The 74-page report also discusses user requirements for office communications networks, architectural alternatives, communications network standards and market trends.

Communications Networks in Office Automation costs $2,500 from IDC at 5 Speen St., Framingham, Mass. 01701.

SNA-Compatible Device Line To Compete With IBM 3270s

TORRANCE, Calif. — Computer Communications, Inc. (CCI) has announced a new Systems Network Architecture (SNA)-compatible product line of controllers and communications devices designed to compete with IBM's 3270 products.

CCI's Group 8000 Communications Cluster Family includes:

- The 8274 Communications Controller, which reportedly allows transparent open interconnectivity between SNA and pre-SNA hosts and devices.
- The 8276 Remote Cluster Controller, said to replace several IBM 3271, 3274 and 3276 controller models by supporting up to 240 mixed-discipline devices.
- The 8278 Display Station, designed to offer IBM 3278 functionality when teamed with CCI's 8276/8274 controllers.
- The 8287 Printer Station, an IBM 3287 functional equivalent, which can attach directly to CCI controllers, up to 5000 ft away, or to the CCI Display Station. This product features an RS-232 serial interface at 9,600 bit/sec, impact dot matrix, bidirectional printing at 120 char./sec and a mean time between failure of 4000 hours, according to the vendor.

A typical small cluster group, consisting of one CCI 8276 controller, 4 CCI 8278 displays and one 8287 printer, would cost $14,275, the vendor said from 2610 Columbia St., Torrance, Calif. 90503.

Honeywell Unveils Interactive Unit

WALTHAM, Mass. — Honeywell, Inc. has announced its lowest priced CRT terminal.

The VIP7201 is a customer-installable and maintainable interactive terminal. Its configuration flexibility and insert/delete/erase editing features make it appropriate for use in transaction processing and document preparation environments.

The terminal offer a 12-in. nonglare phosphor display. The display is 24 lines by 80 characters.

The 96-key typewriter-style keyboard provides an Ansi 4.14 layout, a calculator-style key pad and seven dual-function keys that can be used in conjuction with the host operating system.

Priced at $795, the VIP7201 is available from Honeywell, 200 Smith St., Waltham, Mass. 02154.

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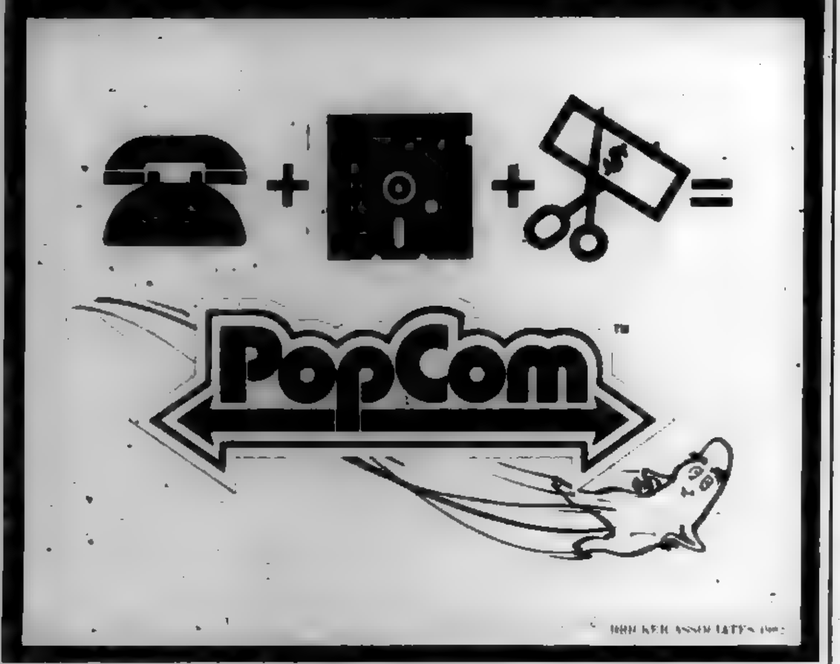

Package Links IBM 3270 With External Data Bases

LOS ANGELES — Trax has introduced a communications software package that is said to let IBM 3270 CRT terminals dial out to external data bases such as the Dow Jones and Co. News/Retrieval and and the Source Telecomputing Corp.'s The Source.

The Terminal Simulation Facility (TSF) links IBM VM systems to IBM or non-IBM communications networks. TSF makes the 3270 terminal appear to be a standard Ascii terminal, providing access to a range of on-line data bases.

It may also be used as a link between IBM mainframes and other computers in the organization. This eliminates the need for separate terminals for the two systems.

TSF runs under any IBM VM operating system and uses a 3705 communications controller or equivalent. It requires no hardware or software modifications to the host system, the vendor spokesman said.

The monthly license fee of $150 to $220 includes maintenance and is available from Trax, 8948 W. 24th St., Los Angeles, Calif. 90034.

IBM 3278, 3287 Get Controller

SALT LAKE CITY, Utah — Beehive International, Inc. has announced an asynchronous cluster controller for use on IBM multipoint, multistation terminal/printer data networks.

The CC76-4 Cluster Controller is said to be comparable with IBM's 7426 Protocol Converter, but also supports bisynchronous protocol as well as Systems Network Architecture/Synchronous Data Link Control for an identical price.

The four-port controller is plug-compatible with IBM 3278 display stations and 3287 printers and their emulators. The unit costs $3,995 from 4910 Amelia Earhart Drive, Salt Lake City, Utah 84125.

System/34, 38 Get Packages

WALTHAM, Mass. — Orion Software, Inc. has announced two additions to its product line of office automation and communications software for IBM systems.

Telex/34 was designed to enable the IBM System/34 user to create, store, transmit, receive and distribute Telex I and Telex II messages with any Telex carrier permitting direct binary synchronous communications (BSC) with their networks. By using the Direct Distance Dialing connection with a synchronous modem, users can transmit BSC 2780/3780 protocol-based messages to the Telex carriers' store-and-forward facility where they are converted into the asynchronous format required by domestic and international networks, the vendor claimed. Telex/34 does not require a hardware protocol converter.

Network Orion allows multisite users of System/34s and 38s to establish a controlled and managed network of computer resources. Each site in the network has its own Network Profile that defines its relationship to other sites. A central site facility can have a Network Profile that puts it in communication with all other sites, while remote sites may be restricted in communications to the central site. Users can establish any network architecture that matches their operational requirements.

Telex/34 and Network Orion are available for $3,500 and $10,500, respectively, from the vendor at Suite 200, 400-2 Totten Pond Road, Waltham, Mass. 02154.

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IBM Cuts Prices, Offers Discounts On 3380, 3880s

RYE, N.Y. — IBM announced that it has cut purchase prices on its top-of-the-line 2G-byte 3380 disk drives and accompanying 3880 disk controllers by 15%.

In addition, the firm announced a volume discount program for the 3380 and 3880 that offers users discounts ranging between 6% and 12%.

The company did not have good news, however, for those who want to lease or rent IBM's biggest disk products on short-term arrangements. Rent and lease prices were raised 15%.

IBM also announced that long-term leases on the 3380 and 3880 are now available through IBM Credit Corp.

As examples of the price changes, a 3380 AA4 disk drive that formerly cost $116,050 is now priced at $98,640. The same unit leased for $2,645 per month; it now leases for $3,075 per month on a two-year plan.

A 3380 Model B4 that cost $84,240 carries a $71,600 price tag. The unit, which leased for $1,940 per month, leases for $2,230 on a two-year plan.

The 3880 Models 1, 2 and 3, formerly priced at $78,790, now cost $66,970. They formerly leased for $2,000 per month and now lease for $2,300 on a two-year plan.

Maintenance prices on all the affected machines remain unchanged.

Analysts said the pricing moves may be an effort by IBM to bring 3380 and 3880 prices in line with pricing structures recently announced by several plug-compatible vendors. The move is also consistent with IBM's long-standing effort to make it more attractive for users to purchase rather than lease IBM hardware.

The 3380 price changes complete a price revision on IBM's big disk drives, according to International Data Corp. analyst Jack Hart. The firm announced price cuts on its second largest disk drives, the 3350 and 3375, last October, he recalled.

Tektronix Debuts Ink-Jet Printer

BEAVERTON, Ore. — An ink-jet color graphics copier said to produce eight-color copies and up to 125 definable patterns was announced by Tektronix, Inc.

The Model 4691 was designed to do simulation, design preview, stress analysis, ultrasonic scanning and surface modeling applications, according to a spokesman.

It is capable of producing B-size (297 by 432), and A-size (216 by 279) output in a horizontal or vertical format, and is fully compatible with Tektronix's 4113 Option 9 color graphics terminal and other vendor equipment depending on interfaces, a spokesman for the company said.

The stand-alone 4691 can either be used as a host connection, or as part of a local workstation. In local applications, up to four terminals can be connected, Tektronix said.

Pricing for the unit is targeted at $12,500 and will be available in the Spring of '83.

More information is available from Tektronix, Inc., P.O. Box 500, Beaverton, Oregon, 97077.

Two Micro-Based Units Added to Pertec Systems

IRVINE, Calif. — Pertec Computer Corp. has unveiled two microprocessor-based additions to its family of computer systems: a dual-processor business system and a system aimed at distributed processing.

Based on the Motorola, Inc. MC68000 microprocessor, the Pertec 3000 is said to be a 16/32-bit microcomputer business system that supports up to 19 terminals or printers in any combination and has over 1M byte of random-access memory and 280M bytes of storage.

This system was designed for small to medium-size businesses to handle a wide range of data processing functions simultaneously, according to the vendor. The operating system reportedly supports languages such as C compiler and Basic. The 3000 also features an 8 MHz clock frequency with the ability to implement up to 600,000 instruction/sec, the vendor said. Prices for this system start at $18,000, and it is currently available.

Also introduced was the Pertec XL50 Distributed Data Entry/Processing System, the latest addition to the XL minicomputer-class family. This machine reportedly addresses the requirements of the distributed data marketplace, utilizing Ansi Cobol, multiport communications and IBM 3270 Display System emulation.

This system provides computing capability at each workstation for true distributed data entry and processing, while providing on-site expansion capabilities as future needs arise, the vendor spokesman said.

It supports peripherals, including up to 32 standard or intelligent CRT terminals, multiple high-speed printers with spooling, multiple concurrent communications ports, an intelligent coaxial station controller and a complete range of storage media, the vendor said. This system ranges in price from $70,000 to $200,000.

This system is scheduled for early 1983 shipment. Further details are available from Pertec at 17112 Armstrong Ave., Irvine, Calif. 92714.

Mass Storage Subsystems Out For 32-Bit VAX-11 Processors

SANTA ANA, Calif. — Emulex Corp. has announced three mass storage subsystems compatible with Digital Equipment Corp.'s 32-bit VAX-11 processors.

The FXS51 Series of subsystems are available in three configurations aimed at the VAX-11/730 Unibus, VAX-11/750 Comet Memory interface bus and VAX-11/780 synchronous bus interconnect. The subsystems incorporate Emulex DEC-compatible disk and tape drives, Fujitsu, Ltd. M2351A disk drives and Control Data Corp. 92181 tape drives, the vendor spokesman said.

The three subsystems are:

- The FVS51 for the VAX-11/730 Unibus system. This subsystem incorporates an Emulex high-speed disk controller and an Emulex TC12 tape coupler. The subsystem has a storage capacity of 414M bytes and functions as a DEC RM80 subsystem.

The FVS51 costs $26,150.

- The FCS51 for the VAX-11/730. The unit contains an Emulex SC750/B series CMI bus disk controller and an Emules TC12 tape coupler. Storage capacities can range between 349M- and 414M bytes. The unit emulates two standard RP06 subsystems or one expanded RM08 subsystem.

The FCS51 costs $30,100.

- The FSS51, which emulates two standard DEC RP06 subsystems or one expanded RM80. The unit incorporates Emulex's V-Master 780/B series SBI bus disk controller and TC12 tape coupler. Storage capacity ranges from 349M to 414M bytes.

The unit costs $34,650.

Emulex is headquartered at 2001 E. Deere Ave., Santa Ana, Calif. 92705.

Univac 0777 Model II Performance Extended

BLUE BELL, Pa. — Sperry Univac has enhanced its 0777 Model II Laser Printer with hardware and software features that reportedly extend its performance.

The hardware features include improved effectiveness of the off-line system through the use of 6250 bit/in. group-coded recording magnetic tape, enhanced print quality with the Alternate Development Station, font expansion to 1,024 or 3,200 characters and improved printer efficiency with 2M-byte Data Transfer.

The new software includes Honeywell, Inc.'s Tape Input capability and Expanded Electronic Forms Generation.

A basic 0777 Model II configuration is priced at $378,500, the vendor said from P.O. Box 500, Blue Bell, Pa. 19424.

PE Reduces Prices To 34% on Cadam

OCEANPORT, N.J. — Perkin-Elmer Corp. has announced several product options and price reductions of up to 34% on its turnkey computer-aided design and manufacturing products.

The Cadam system, based on the company's 32-bit minicomputers, is now expandable to an eight-terminal workstation to run Cadam, Inc.'s Cadam software.

New peripheral devices for use on the Cadam system include 300- and 600 line/min. printers, a 300M-byte disk to accompany the 67M-byte disk and a dual-density high-speed tape drive to complement the existing low-speed drive, the vendor said.

Capability Unveiled

The company also unveiled a programming workstation capability that allows the user to run Fortran, Basic or assembly language programs on a time-sharing basis and perform simple text processing.

Price reductions of 13% to 34% on one to four workstation systems were also announced. A single-terminal workstation consisting of a PE 3200 Series processor, 2M bytes of memory, 67M-byte disk storage and an interactive vector-refresh graphics terminal packaged in a workstation enclosure is reduced in price from $140,000 to $160,000. Larger configurations boast price breaks up to $355,000, according to the vendor.

Perkin-Elmer's Data Systems Group is based at 2 Crescent Place, Oceanport, N.J. 07757.

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For more information, just call toll free (800) 543-8130 (in Ohio, 800-762-6517). Or write to EDP Systems, NCR Corporation, Box 606, Dayton, Ohio 45401.

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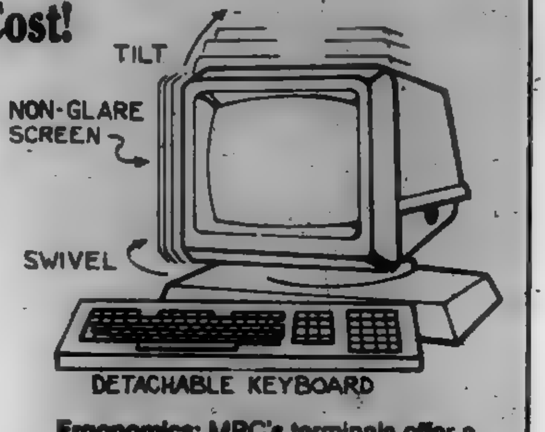

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Compupro Unveils Dual-Micro Family

OAKLAND AIRPORT, Calif. — A family of dual-processor-based desktop microcomputers featuring 8/16-bit technology has been introduced here by Compupro Systems.

Designated the System 816 series, the product line is configured around an Intel Corp. 8085/8088 CPU and offers capabilities ranging from a single-user workstation to a high-performance multiuser system supporting users under Compupro's proprietary MP/M 8-16 operating system, according to the vendor.

The System 816 is said to be available in three models, starting with an entry-level, single-user system called System 816/A. This system includes Compupro's 8085/8088 CPU board running at 6 and 8 MHz, 128K bytes of random-access memory (RAM), four serial ports, two ports and two 8-in. floppy disk drives storing 2.4M bytes. Prices for this system begin at $5,495.

The System 816/B provides the same CPU board and software, but contains 256K bytes of RAM and six serial ports to support additional stations and more peripherals. This system costs $6,995, according to the vendor.

At the top of the line is the 816/C, which offers support for up to 16 user workstations and a wide range of mass storage peripherals. The base price for single units is $8,995.

Each of these systems features built-in clock/calendars, interrupt controllers, interval times and optional math processors. Programming languages available include assembler, Basic, Fortran, Cobol, as well as all Digital Research, Inc. CP/M-based programming languages. The vendor is located at Oakland Airport, Calif. 94614.

Compupro Systems' System 816

CA Products Bolster Naked Mini Line

IRVINE, Calif. — In a flurry of recent announcements, Computer Automation, Inc.'s Naked Mini Division unveiled seven new product offerings:

- The System III version of the Bell Laboratories Unix operating system, along with a series of packaged Naked Mini Series 5 systems. The typical low-end packaged configuration supports up to four users and consists of a Series 5 processor with memory management, 256K bytes of random-access memory, a 1M-byte floppy disk subsystem, a 10M-byte Winchester and four serial ports. Prices for this system start at $7,990.
- A 1M-byte memory board for the company's line of 16-bit superminicomputers priced at $3,990.
- A new option for its Omnix desktop computer system enabling it to run Digital Research, Inc.'s CP/M operating system. This option is reportedly available for $500.
- A local-area network that reportedly offers users low-cost communications capabilities for Omnix computers. The network uses standard telephone wire in a twisted-pair cable as the communications medium and RS-232C ports as the interface. A typical configuration would cost approximately $8,145.
- Color graphics capabilities for the Omnix computer line featuring eight colors, graphs, pie charts and various other visual formats.
- Two new disk drive configurations starting at $8,000 that reportedly provide more on-line storage to users and greater flexibility.

Computer Automation is located at 18651 Von Karman, Irvine, Calif. 92713.

Codata Announces Unix-Based Micro

LAS VEGAS — Codata Systems Corp. has announced a Motorola, Inc. 68000/Bell Laboratories Unix-based microcomputer.

The standard eight-user Codata 3300 is said to come with 320K bytes of parity-protected random-access memory, and its Intel Corp. Multibus architecture supports several different storage configurations. Backup can be accommodated through floppy disks, cartridge tape or nine-track tape drives.

Codata also announced business applications software for the Codata 3300. These are data base management system, electronic spreadsheet and word processing packages.

The standard Codata 3300 is priced at $9,600. Codata is located at 285 N. Wolfe Road, Sunnyvale, Calif. 94086.

Boasts User Flexibility

Datamac Offers 16-Bit Micro

Datamac Computer Systems' Series 1600

SUNNYVALE, Calif. — A 16-bit microcomputer offering a Zilog, Inc. Z80A microprocessor along with either an Intel Corp. 8086 or a Motorola, Inc. 68000 processor has been unveiled here by Datamac Computer Systems.

Called the Series 1600, the new system was designed to give users flexibility in configuration. In the Z80A mode, the system supports Digital Research, Inc.'s CP/M 2.2, CP/M 86, MP/M II and IBM's Mdos. In the 8086 microprocessor mode, it supports CP/M 86, MP/M 86 and IBM's MSdos. In the 68000 mode, the system supports Bell Laboratories' Unix and Phase One Systems, Inc.'s Oasis.

The system also features Intel Corp.'s Multibus, allowing configurations from a small three-card system to a large seven-card system, the vendor said.

Other important features include Help keys, 12 programmable function keys, CRT screen controls, an 8-MHz processor and a firmware-based Systems Activity Monitor that reportedly enables local or remote users to display and alter memory.

Prices for this system range from $3,300 to $8,000. Datamac is based at 680 Almanor Ave., Sunnyvale, Calif. 94086.

DEC Micro Enhancements Out

MAYNARD, Mass. — In a recent announcement, Digital Equipment Corp. unveiled several new software and hardware enhancements for its Professional 300 series line of personal microcomputers.

The software offerings include a word processing system ($295) as well as IBM communications capabilities featuring bisynchronous and Systems Network Architecture-compatible emulators ($595). Also announced from the vendor were Professional Tool Kit versions of Cobol, Dibol and Pascal software languages, priced at $2,300.

The hardware enhancements for the personal computers include a Digital Research, Inc. CP/M option that reportedly allows the small system to run CP/M-based software ($695).

Also announced were an upgrade kit for the firm's Professional 325 to 350 computers, which is priced at $2,300, and a 256K-byte memory add-on option that allows the system to reach a maximum of 1M byte of memory ($795), the vendor spokesman reported.

DEC is headquartered in Maynard, Mass. 01754.

Corona Micros IBM-Compatible

WESTLAKE VILLAGE, Calif. — Corona Data Systems, Inc. has unveiled the first members of an IBM Personal Computer-compatible family of computers.

Called the Corona PC and the Portable PC, these systems feature a 320K-byte half-height diskette drive, a high-resolution green-phosphor monitor, 128K-byte memory, both a serial port and a parallel port and high-resolution graphics. IBM's MSdos operating system is also included.

The base price of the Corona PC is $2,595, and the Portable PC is priced at $2,395. Further details can be obtained from the vendor at Suite 110, 31324 Via Colinas, Westlake Village, Calif. 91361.

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In Internal Information Area

IRS Said on Verge of Processing Change

By Jeffry Beeler
CW West Coast Bureau

CAMBRIDGE, Mass. — The Internal Revenue Service is on the verge of a major change in the processing of internal information, according to Ron Layel, acting chief of the IRS's office automation support branch.

At Harvard University's Program on Information Resource Policy, Layel recently told of the coming changes at the IRS in his talk titled "Managing Information Resources in an Information-Intensive Environment."

The IRS processes three types of information pertaining to taxes, Layel said: the actual tax return processing, collection and taxpayer services. These three areas require 33% of the IRS's staff.

This information then breaks down into external and internal categories. "It's the area of internal information that we've had trouble with," he said, adding, "but we're on the verge of a major change. Bringing the IRS up to date is the primary objective."

A study begun two years ago found that there was a tremendous need for information among the executives and that need was not being answered because of an outdated purchasing system. "The process had reached the degree of absurdity," Layel said. "Even for a word processing system, you had to go through three offices, including the federal bureau."

With 10 regional offices and 60 district offices, the IRS needed to develop a system by which these field offices could make some of their own purchasing decisions. The study found a need for automation planning and a redefinition of roles for the field offices. "Very little EDP decisions were made in the field offices even though they did much of the work," Layel observed.

"Auditors and tax collectors were preparing reports and interviews the same way since in the 1920's and 1930's," Layell said. "The offices were very paper-oriented."

Acting upon the study's findings, the IRS established a policy board to develop procedures for office automation and technology. "We streamlined the acquisition process," Layel said. "Local managers could make decisions on certain technical products."

Further, a three-way partnership was created among a new office automation branch, the field executives and the computer services department. "Data processing is centralized but everything else is decentralized," he noted.

Although the changes in purchasing procedures were made only two or three months ago, Layel expects an increase in information technology to take place in the field offices very quickly. Local executives can now make independent decisions that are not weighted down in red tape when implemented.

P-System Support Center Open For Displaywriter Customers

SAN DIEGO — Under an agreement between IBM and Softech Microsystems, Inc., an IBM Displaywriter at the UCSD P-System Support Center has been introduced to provide customers of Displaywriter P-Systems with technical information and support services.

Customers who receive shipment of Displaywriter P-Systems will be able to obtain technical information and support services with a single toll-free phone call to the support center, a spokesman said. Open between 6 a.m. and 5 p.m. Pacific Standard Time five days a week, the support center is manned by a staff of trained technicians and a senior diagnostician equipped to provide callers with speedy responses to their questions about the P-System data processing facilities on the Displaywriter.

This service will be provided free to all customers for the first 90 days after their purchase of the Displaywriter P-System and will be offered as a subscription service after that period, according to a vendor spokesman.

More information can be obtained from Softech Microsystems, which is located at 16885 W. Bernardo Drive, San Diego, Calif. 92127.

Word Processor Added to Cies 680s

IRVINE, Calif. — CIE Systems, Inc. has introduced the addition of a word processing system to its Cies 680 family of Motorola, Inc. 68000- and Bell Laboratories' Unix-based business computer systems.

Designated LEX/680, the word processing system reportedly is based on the LEX-11 system currently available on Digital Equipment Corp. PDP-11 and VAX-11 systems. LEX/680 is an integrated word and list processing multiuser software package designed around a single keystroke command structure. Standard features include menu prompting, full-screen editing, word wrap, automatic page breaks, automatic carriage return, text search and replace and automatic paragraph assembly, the vendor said.

Available in the first quarter 1983, LEX/680 has a list price of $1,500. For further information contact the vendor at 2515 McCabe Way, P.O. Box 16579, Irvine, Calif. 92713.

Micros Converted To Word Processors

GLASGOW, Scotland — Wolfson Microelectronics Institute (WMI), an international application consultancy based at Edinburgh University, has introduced a command keyboard that, when added to the existing keyboard, is said to convert a microcomputer into a dedicated word processor.

The Keystar module will perform this conversion on a microcomputer using Wordstar, the word processing program from Micropro International Corp. It will provide 56 of Wordstar's editing commands available on the software program to any microcomputer that has a cable connection between the keyboard and the unit.

The module was designed for engineers who use conventional micros for preparing and editing reports and which occasionally need word processing. It was also designed for educational institutions.

The keyboard is available for $280 from WMI, 120 Bothwell St., Glasgow, Scotland G2 7JP.

In Mid-1983

Apples to Talk to IBM CPUs

CUPERTINO, Calif. — Apple Computer, Inc. has announced that next year it will introduce a hardware/software interface said to allow Apple personal computers to communicate with IBM mainframe computers.

The 3270 cluster controller emulator will enable Apple computers to emulate IBM terminal functions, the vendor claimed. Apple computer users will be able to take advantage of mainframe functions such as on-line data entry, inquiry and response, electronic mail, remote data base access and program development.

The device will be available in a Systems Network Architecture/Synchronous Data Link Control version that emulates the IBM 3276 Control Unit Display Station and a binary synchronous communications version that emulates the IBM 3271 Cluster Controller.

Priced at $1,000/port, the product is scheduled to be available in mid-1983. For further information contact Apple at 20525 Mariani Ave., Cupertino, Calif. 95014.

Program Boasts Spaced Printing

NEW YORK — Lifeboat Associates has introduced a software program that reportedly brings true proportionally spaced printing to any microcomputer with a Digital Research, Inc. CP/M (R)-80-compatible system and a daisywheel printer.

Magicprint offers four modes of printing, true proportional spacing — justified and unjustified — and nonproportional spacing — justified and unjustified. In addition, Magicprint also underlines, overstrikes, creates bold faces, creates multicolumns and creates footnotes, the vendor said.

Magicprint is available for $195, the vendor said.. Further information can be obtained from Lifeboat Associates, which is located at 1651 Third Ave., New York, N.Y. 10028.

Ethernet Handbook Out for Users, Analysts

SAN FRANCISCO — Shotwell & Associates, Inc. is offering "The Ethernet Handbook."

The book includes products from more than 40 vendors and is designed to be useful for Ethernet users, industry analysts, and Ethernet product manufacturers.

The 408-page book costs $125 from Shotwell & Associates at Suite 481, 680 Beach St., San Francisco, Calif. 94109.

To Telex, TWX, Bell Systems

Typewriters Offered Net Access

MOUNTAIN VIEW, Calif. — Chat Communications and Systel Computers, Inc. of San Jose, Calif., have jointly introduced plug-compatible accessories for electronic typewriters that will offer word processing and the ability to access automatically the telex, TWX and Bell systems networks, worldwide.

The Systel II consists of a 12-in. CRT terminal and a disk drive that connects directly to the electronic typewriter. The Chat II connects the Systel II to a printer and/or national and international networks. The system allows businesses to upgrade familiar existing office equipment, the vendor said.

The system is available for approximately $5,000. More information is available from Chat Communications, 2438 Wyandotte St., Mountain View, Calif. 94043.

WP Document Index Runs on Wang VS

AURORA, Colo. — GPB Consulting has introduced a word processing document indexing package that is said to run on all members of the Wang Laboratories, Inc. family of VS computers.

Kwic-Search is an automated keyword-in-context indexing system that is claimed to create the keyword index automatically. The operator enters a word or group of words, and the system responds with a list of documents containing the requested information.

Kwic-Search reportedly revises the index, adding references to new documents, deleting references to documents removed from the system and updating the index with changes made to revised documents.

Kwic-Search is available for $2,000 from GPB Consulting, 17957 E. Florida Drive, Aurora, Colo. 80017.

WP Daisywriter Features 25-Line Screen Display

LOS ANGELES — Computers International, Inc. has introduced a word processing system that is said to feature a 25-line screen display and 56K bytes of random-access memory.

Included in the Daisywriter system is a keyboard, a 12-in. display and the Daisywriter letter-quality printer. The keyboard has a standard typewriter-style design with a numeric key pad, a Help menu and a number of labeled function keys, the vendor said.

The function keys include margin justification, proportional spacing, automatic centering, underline, boldface and shadow print. Also included in the function keys are subscript/superscript, reprint/clear document, screen/paper scrolling, forward/reverse and typewriter/word processor.

The system is available for $1,995, Computers International said from 3540 Wilshire Blvd., Los Angeles, Calif. 90010.

Magna Enhancement Out

CHICAGO — A.B. Dick Co. announced a software enhancement for its Magna III and Magna-Writer information processing systems designed to streamline operator functions.

Keystroke Commander allows both systems to memorize repetitious tasks for single-keystroke instructions.

It costs $450 from the firm at 5700 W. Touhy Ave., Chicago, Ill. 60648.

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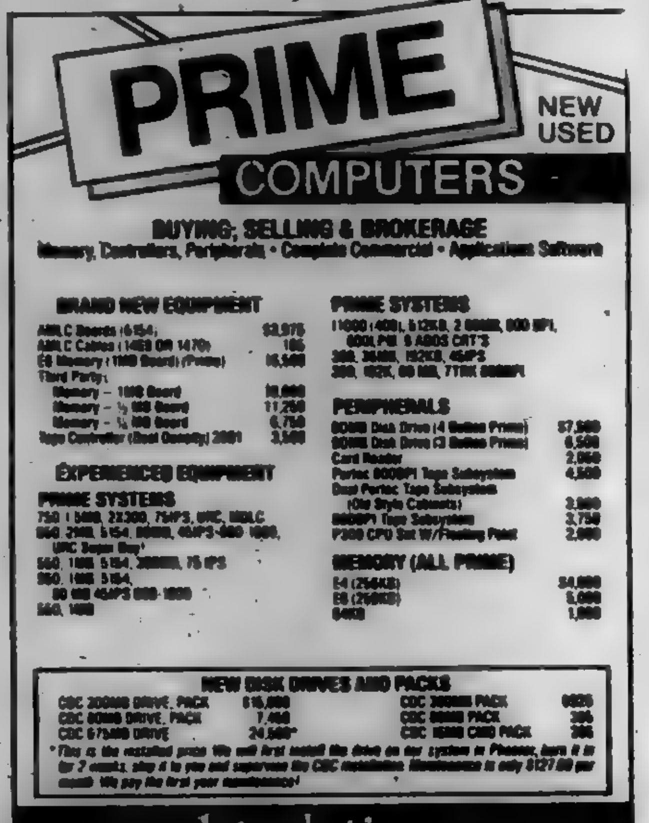

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December 17, 1982

O.P.M. Founders Sentenced In Fraud Case

By Bill Laberis
CW Staff

NEW YORK — Two brothers-in-law who engineered one of the largest computer business frauds in history while building O.P.M. Leasing Services, Inc. into a darling of the investment community are going to jail.

A federal judge last week sentenced Myron S. Goodman, 36, to 12 years in prison and his business partner, Mordecai S. Weissman, 35, to 10 years on charges of fraud and conspiracy. Each pleaded guilty to the charges one year ago. Each will also be eligible for parole after serving one-third of his sentence.

The sentences, handed down with stern reproachments by U.S. District Court Judge Charles S. Haight Jr., added another chapter to a sordid tale of deceit that began 10 years ago and ended in early 1981. In total, the leasing scheme fabricated by the pair bilked various investors, including pension funds, of more than $200 million, causing their customers another $100 million in losses, Judge Haight noted.

A federal memorandum detailing the fraud showed the scheme reached a high point from 1978 to 1981, when

(Continued on Page 116)

Motorola Edges TI; Japan Flexing Muscle: Report

By Bill Laberis
CW Staff

SCOTTSDALE, Ariz. — Motorola, Inc. has edged ahead of a troubled Texas Instruments, Inc. as the No. 1 semiconductor vendor, according to a recent report of the Integrated Circuit Engineering Corp.

Moreover, Japanese firms are flexing more muscle in the semiconductor arena, with Nippon Electric Co. (NEC) closing rapidly on TI for the No. 2 slot, and four Japanese companies now figuring in the top 10 manufacturer listings, the report continued.

"Status 1983 — A Report on the Integrated Circuit Industry," stated that TI remains the top overall producer of integrated circuits, but that its sales to other system manufacturers (merchant sales) fell drastically in 1982 as TI began de-emphasizing the merchant market segment. NEC, the report said, will surpass TI as a merchant semiconductor manufacturer in 1983.

Overall in 1982, circuit production by U.S. merchant suppliers increased just 4% to $6.3 billion, the report said.

"Severe price slashing, begun in late 1980 by the Japanese to keep [production] lines operating at capacity in a falling market, has continued through 1982, with average integrated circuit selling prices steadily falling by 14% over the two-year period," the report stated. "In order to cope with this situation, many U.S. and European integrated circuit houses have

(Continued on Page 110)

RANK	COMPANY	1982 SEMICONDUCTOR PRODUCTION (MILLIONS OF DOLLARS)
1	MOTOROLA	1,310
2	TI	1,227
3	NEC	1,100
4	HITACHI	800
5	NATIONAL	690
6	TOSHIBA	680
7	INTEL	610
8	PHILIPS	500
9	FUJITSU	440
10	SIGNETICS	360
TOP TEN TOTAL		$ 7,717
OTHER SEMICONDUCTOR MANUFACTURERS		$ 9,958
WORLDWIDE TOTAL		$ 17,675

Integrated Circuit Engineering Corp. Chart

Top Ten Global Semiconductor Suppliers

Threats Follow at Other Offices

Bomb Blast Damages IBM Facility

By Paul Gillin
CW Staff

HARRISON, N.Y. — A bomb blast that caused extensive damage at an IBM office building here Dec. 16 was followed by telephoned bomb threats to IBM offices in White Plains, N.Y., Manhattan and Philadelphia, forcing the evacuation of hundreds of employees. The bombed building had been evacuated only minutes before the explosion, police said.

An anonymous caller to a local newspaper group claimed responsibility for the explosion, police said. The caller indicated he was from the same group that had claimed responsibility for the bombing of a South African Airways purchasing office in Queens, N.Y., about four hours before the IBM building was hit.

The bomb went off shortly after police had evacuated the building, which had about 30 people inside prior to the explosion. The bomb was planted outside the building, police said.

The Federal Bureau of Investigation has been called in to investigate the case, "to see if there is any connection with a terrorist or radical group," according to an FBI investigator.

Bomb threats were received at two IBM offices in White Plains and at a facility in Manhattan the day after the explosion. On Monday, Dec. 20, a similar threat was phoned in to an IBM office building in Philadelphia. No bombs were found at

(Continued on Page 108)

Memorex Reduces Work Week for 750

SANTA CLARA, Calif. — Seven hundred and fifty hourly employees of Memorex Corp. will have their work weeks shortened from five to four days, or from 40 to 32 hours, beginning Jan. 10, a move provoked by the lingering recession.

The reduced work hours, affecting all production employees in Memorex's large disk drive operation, will remain in effect at least throughout the first quarter of 1983, or until volume shipments of the company's 3680 disk drives commence, a company spokesman said. The 3680, featuring thin-film storage technology, is expected to spearhead the company's recovery-propelled thrust into 1983.

All affected employees work at Memor-

(Continued on Page 112)

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Micro Maintenance to Rise 36% Annually: Study

MOUNTAIN VIEW, Calif. — Maintaining the installed base of personal computers will carry a price tag that will grow 36% per year through 1987, reaching $1.4 billion by that time, according to a recent study.

This growth, according to Input, Inc.'s "Maintenance of Personal Computers," is nearly double the growth rate for spending on all other types of computer repairs, indicating a major opportunity for third-party maintenance firms that currently dominate microcomputer service.

The report also spotlights the service strategies of major personal computer manufacturers and third-party maintenance vendors. Tandy Corp., for example, has reportedly established nationwide centers offering carry-in maintenance service.

Input claims the initial phases of the microcomputer explosion have been marked by a low priority given to service requirements, with patchwork maintenance options offered by the manufacturers and dealers.

A second phase of microcomputer development has begun, the report notes, with vendors consolidating the number of dealers and distributors handling product lines and restructuring service offerings.

However, "Vendors are spending their money on development and promotion. Few have the resources to support a full-fledged, nationwide service effort," according to Graham Kemp, study author.

"Maintenance of Personal Computers" is priced at $750 from Input, 1943 Landings Drive, Mountain View, Calif. 94043.

UK Micro Group Urges Ban on Imports

LONDON — U.S. steelmakers are not alone in their protectionist efforts to bolster sagging industry revenues by lobbying to restrict foreign imports.

A group of 22 British microcomputer companies have respectfully requested to Prime Minister Margaret Thatcher that a one-year ban be imposed upon imports of both U.S.- and Japanese-manufactured microcomputers.

The British Microcomputer Manufacturers' Group (BMMG), representing about half the UK micro makers, has also requested that the British government reassess its procurement policies in such a way to give greater preference to the procurement of UK-made over foreign-made micros and peripherals.

Businessland Opens Store

SAN JOSE, Calif. — The first of a new chain of electronic business equipment retail stores called Businessland, Inc. has opened here at 3610 Stevens Creek Blvd.

The retail centers will sel[illegible] series of small business computers from different vendors ranging in price from $2,500 to $15,000. These machines are said to perform word processing, data management, financial analysis and a variety of accounting applications.

Businessland is headquartered at 4102 Moorpark Ave., San Jose, Calif. 95117.

Bomb Damages IBM Building

(Continued from Page 107)

any of the locations and no one took responsibility for the calls, police said.

Damage estimates in the explosion were described as "extensive" by a police spokesman.

"Just about all the windows on one side of the [five-story] building were blown out," said Stephen Purdy, a sergeant at the Harrison Police Department. "Some of the metal superstructure is twisted, too."

Purdy said he felt that blast at the police station, 3½ miles from the IBM building. He said the department received inquiring phone calls from as far as five miles from the bomb site.

An anonymous caller reportedly phoned an editor at the local Gannett Westchester Newspapers office a half hour before the blast occurred at 7:35 p.m., police said. "You have 30 minutes to get everybody out. We also did the same thing to South African Airways," said the caller, who did not identify the group he represented.

The South African Airways bombing occurred at 3:45 p.m. the same day, also minutes after the building had been cleared. No injuries were reported and damage estimates were not available at press time.

The Harrison office building, which IBM leases, houses marketing and support offices for the company's National Accounts, National Marketing, Field Engineering and Customer Service Divisions. About 500 IBM people work at the building during the day, a spokesman said.

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Predicted to Reach $12 Billion by 1986

IDC: Application Terminal Market to Triple

FRAMINGHAM, Mass. — The value of the application-unique terminal market will triple to $12 billion in annual revenues by 1986, according to a report published by International Data Corp. (IDC).

The fastest growth is anticipated in the area of portable entry devices, such as those used in stores to order merchandise. IDC expects more than one million of these units will be installed by 1986.

The report, entitled "Application-Unique Terminals," identifies and defines various kinds of application-unique terminals, assesses the current and future installed base and outlines the competitive makeup of each of these markets.

The use of on-line financial terminals, including automatic teller machines (ATM), bank teller terminals and financial transaction terminals will also increase dramatically, spurred by new trends in interstate banking and the popularity of ATMs. The IDC report predicts there will be nearly six times as many ATM's installed by the end of 1986 as there were in 1981.

Other predictions include:

- Department store point-of-sale (POS) terminals will be a limited growth market, expanding at about 9% per year.
- The specialty store POS terminal market will grow at 16% per year to over 100,000 units by 1986.
- The credit authorization inquiry/response terminal market will decline because the function of these devices is already integrated into most POS terminals. The market will probably not support credit authorization terminals after 1983.
- The market for factory data collection devices will grow at an annual rate of about 29% as early models are replaced. The installed base will grow from 75,000 units at the beginning of 1982 to 215,700 by the end of 1986.

The report costs $2,500 from IDC's Corporate Planning Service Program, Five Speen St., Framingham, Mass. 01701.

Plans to Trade ISS Division

Univac to Gain Share of MPI

BLUE BELL, Pa. — In a move designed to yield access to thin film and vertical recording technologies, Sperry Univac has inked a letter of intent to trade its Information Storage Systems (ISS) Division for a share of Magnetic Peripherals, Inc. (MPI).

At present, MPI, which makes IBM-compatible storage equipment, is owned primarily by Control Data Corp. (70%) and Honeywell, Inc. (27%). If all approvals are gained and a definitive agreement forged, Univac will become a third major partner in MPI, although its exact equity share in MPI will not be disclosed until a final agreement is signed.

According to the agreement, all 1,800 ISS employees, most of whom work in one plant in Santa Clara, Calif., would join MPI's 9,000 member work force. A Univac spokesman said no layoffs are contemplated at this time. Founded in 1969 as a maker of IBM-compatible disk drives, ISS now manufactures only Univac-compatible drives. Univac acquired ISS in 1973.

With the ISS employees and resources, MPI will continue making proprietary Univac products while researching new mass storage technologies, according to the letter of intent. ISS' top-of-the-line product, the 8840, competes with IBM's 3380, but without using thin-film technology, necessitating the packaging of four drives to achieve the 2G-byte memory capacity of one 3380.

Paul Spillane, Univac's Product Division president, said the joint agreement would allow the company to "benefit from lower product costs and sharing of overhead."

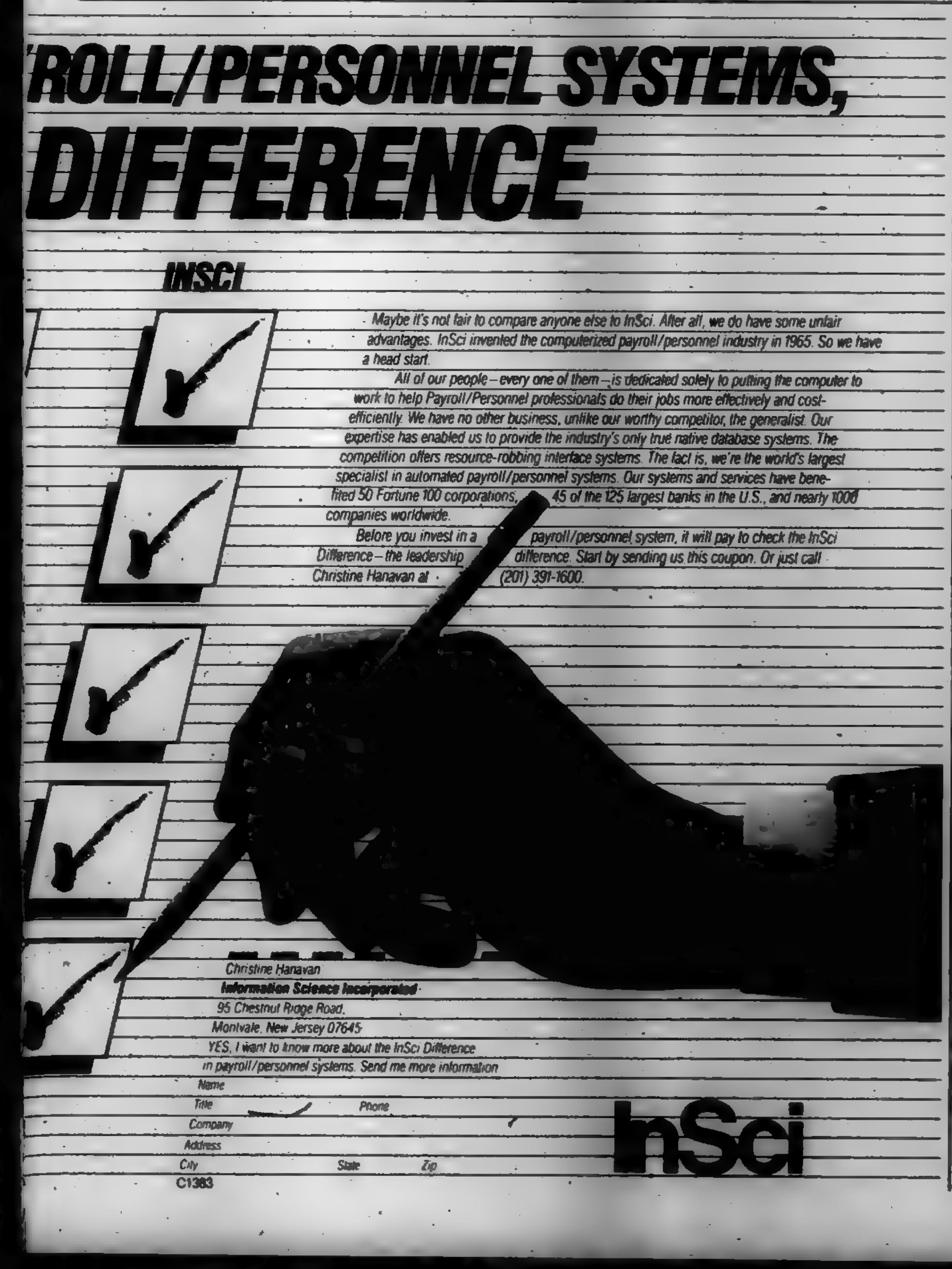
SMI, IBM, Pick Sign Agreement

ROSEMONT, Ill. — Systems Management, Inc. (SMI), IBM and Pick & Associates, Inc. have signed an agreement giving SMI worldwide rights to install the Pick operating system on the IBM Personal Computer, 4321 and 4331 computers.

SMI also announced it will install its Real-Time Processor Language and library of applications software on the integrated family of IBM computers.

The company's objective, it stated, is to provide IBM-based turnkey systems to the marketplace through a worldwide network of independent distributors, vertical market developers and direct end-user sales.

More information is available from SMI, 6300 N. River Road, Rosemont, Ill. 60018.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Report Sees 30% Growth in Computer Services

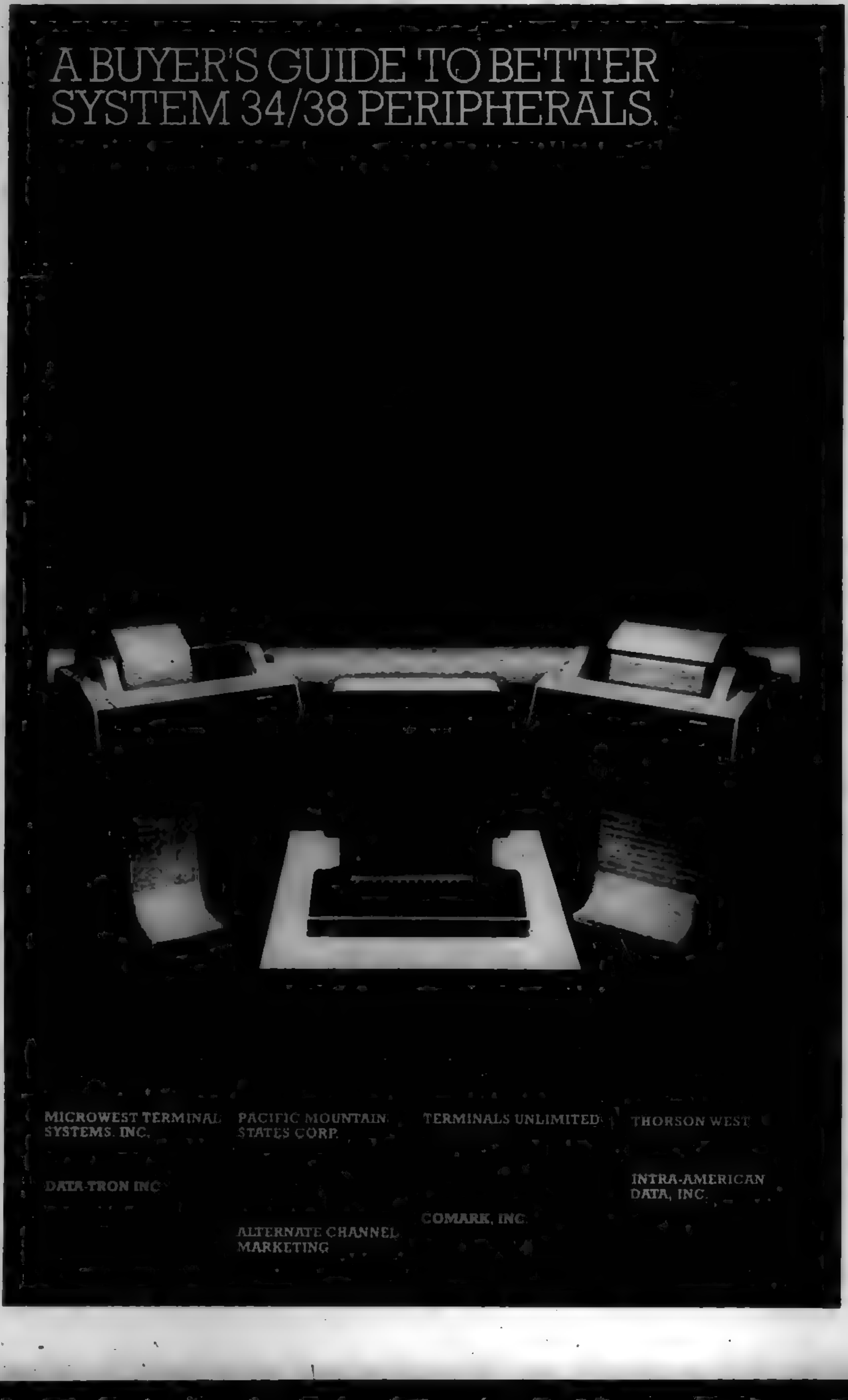
MOUNTAIN VIEW, Calif. — The discrete manufacturing sector of the economy — the segment that manufactures products sold as units vs. bulk — will buy almost $15 billion of computer services in 1987, up from $4 billion in 1982, according to a report released by Input, Inc. The report also predicts this 30% annual growth in demand will be accompanied by major changes in the kinds of computer services demanded.

Market Opportunities in Discrete Manufacturing says the greatest growth potential for computer service vendors exists in manufacturers with fewer than 50 employees (80% of all manufacturing facilities). The resource-intensive nature, of manufacturing makes it a prime area for productivity improvements through computerization, the report says.

Manufacturing will lead the demand curve for computer services with a 36% annual expansion forecast through 1987, followed by engineering and business. Growth of computer-aided engineering will lead the demand for services and applications software, the study predicts.

It presents a profile of the industry and spotlights rapidly growing markets. It analyzes user expenditures by mode of services (software, processing and professional services and integrated systems) and recommends product and marketing strategies that will fare best in the changing manufacturing environment.

The report costs $2,500 from Input at 1943 Landings Drive, Mountain View, Calif. 94043.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Software Exhibit Set for Paris

LOS ANGELES — An International Software Package Exhibition will be held in Paris in Spring 1983 in conjunction with the Convention Informatique '83.

The show will be sponsored by the Salon International de L'Informatique de la Communication et de l'Organisation du Bureau, in agreement with the Information Center for Software Package Users, with the support of the French data processing trade associations. Its purpose is to offer an overview of software available in France and abroad.

The first edition of the software exhibition will be held at the Palais des Congres, Paris, at the same time as Convention Informatique '83, which is slated for May 30 through June 3, the organizers noted.

The software exhibition is open to all French and foreign distributors of software, as well as software package and service suppliers, computer manufacturers, importers, specialty distributors and consulting firms, according to the organizers. It is being held under the auspices of the French Ministry of Foreign Trade and the Ministry of Industry.

Further information may be obtained from United Software Systems and Services Corp. at Suite 1136, 1801 Ave. of the Stars, Los Angeles, Calif. 90067.

Motorola Nips TI, Says Report

(Continued from Page 107)

increased production just to maintain sales at former levels, severely impacting profits for all parties."

The report indicated that the Japanese have further increased production to gather greater market share, with growth of 21% fueling the Japanese supply of $3.3 billion worth of integrated circuits to the world market in 1982. Of this amount, $450 million of production was exported to the U.S., surpassing Japan's imports from the U.S. by 25%.

The report predicts worldwide semiconductor growth in 1983 of 12.7%, to a total value of nearly $20 billion. Of this, production of U.S. manufacturers will be $7 billion, or 9% growth. On the other hand, the Japanese manufacturers should see semiconductor sales grow by 25% in 1983, with production of 64K-byte random-access memory chips pacing much of this anticipated growth.

The impact of the personal computer market on semiconductor sales will be significant, the report states, with Intel Corp.'s 8086/8088 family leading in implementations, followed by Motorola's M68000.

"Status 1983 — A Report on the Integrated Circuit Industry" is priced at $125 from Integrated Circuit Engineering, 15022 N. 75th St., Scottsdale, Ariz. 85260.

Prime's CEO Looks Ahead To Future Plans

By Bob Johnson
CW New York Bureau

NEW YORK — Reflecting on a 20% increase in sales in the third quarter, Joe M. Henson, Prime Computer, Inc.'s president and chief executive officer, said the company will continue to act aggressively to meet the needs of end users in the "changing corporation."

Speaking to security analysts here recently, Henson said that despite the current economic doldrums, Prime has performed well and is committed to becoming a multibillion dollar company in a few years.

To do so, Prime will spend more on research and development and hire people with the skills to produce "full system solutions to business problems," Henson remarked.

"The new corporate user looks at data bases instead of applications. He wants data that is available to all end users regardless of their technical expertise, and Prime recognizes this as the most important aspect of its future plans," he said.

Trend Toward DDP

Addressing specific product areas that Prime will target in its expansion effort, Henson claimed there is a trend away from remote-access processing toward distributed data processing (DDP).

"Local processing will have to be addressed in the near future. Users will demand intelligent terminals and the ability to connect into a network," he said.

Users will increasingly demand system simplicity and ease of use, while system integration and reliability will continue as user requirements, Henson said. Users, he said, will want to sit at one workstation and be able to access all of the information they need.

Further, users are concerning themselves with vendor viability and market staying power, Henson said, claiming users realize the life of the vendor is more important than the life of the product. "Users know that most products have a long service life. What the buyers are now looking at is whether the vendor will be around in the long term, keeping system enhancement and integration in the future in mind."

To stay competitive and to respond to user needs, Henson said Prime will expand its product line at both the high and low end with a price/performance increase of 25% to 30% per year.

He added that Prime is striving to attain "coexistence" with the products of other vendors, claiming "connectability" looms big in Prime's future.

He said the company's product direction for 1983 will focus on an integrated approach to system development, transaction processing for the DDP market and a commitment to IBM's Systems Network Architecture communications protocol for emulation capabilities.

Prime will also seek to develop more data base management systems and user productivity tools.

Adapso Develops Position Papers for Congress

ARLINGTON, Va. — The Association of Data Processing Service Organizations, Inc. (Adapso) has developed three position papers to be delivered to the U.S. Congress and federal agencies responsible for regulating international trade.

"The Problem of International Telecommunications" outlines the differences between the domestic telecommunications policy of deregulation and private sector competition and the foreign, government-controlled and operated versions of the telecommunications industry or posts, telephones and telegraphs. It indicates that a centralized policy-making body is mandatory in order both to protect U.S. interests in matters of information flow and to eliminate barriers to trade.

The second paper, "U.S. Government Policy on International Trade in Services," outlines a purported lack of attention paid to services in U.S. trade negotiations.

The last paper, "Provision of Information Processing Services," is Adapso's plan for negotiation with foreign governments and their regulatory agencies.

The papers are intended to provide a blueprint for U.S. telecommunications and trade policies.

Copies of the papers are available from Adapso, 1300 N. 17th St., Arlington, Va. 22209.

HP Forms Division on Software

PALO ALTO, Calif. — Hewlett-Packard Co. has united four operations from its business computer and technical computer groups to form a new division designed to serve the application software needs of manufacturing companies.

Called the Manufacturing Productivity Division, the new entity will focus on producing modular, distributed and networked software for planning, scheduling, monitoring, controlling and testing applications involving materials, processes, personnel or physical facilities, the company claimed.

Gaylan I. Larson, former general manager of HP's Data Systems Division, was named general manager of the new division.

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Fortune Systems Corp., San Carlos, Calif., has received a $20 million line of credit from the Bank of America.

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Management Science America, Inc. has declared a two-for-one stock split in the form of a stock dividend.

$ $ $

Quixote Corp., Chicago, has received a $4 million payment under a research and development contract from Diversified Partners, Ltd., a limited partnership sponsored by Batemen Eichler, Hill Richards, Inc. of Los Angeles. The funds will be used to complete the development of Quixote's proprietary laser-read videodisk manufacturing process.

$ $ $

SEI Corp. and **TMI Systems Corp.** have reached an agreement in principle for the acquisition of TMI by SEI. Approximately $12.5 million in SEI common stock and cash will be paid to TMI shareholders in exchange for all outstanding TMI shares, and up to an additional 64,000 shares of SEI common stock will be reserved for TMI stock options assumed by SEI.

$ $ $

Communications Satellite Corp. (Comsat) has filed a registration with the Securities and Exchange Commission covering a proposed offering of one million shares of common stock. This will be Comsat's first offering of common stock since its initial public offering in June, 1964.

$ $ $

AT&T has increased the number of shares for its common stock offering from 15 million to 16.5 million. Shares will be offered at $60 per share. The offering will be managed by Morgan Stanley & Co., Inc.; Blyth Eastman Paine Webber, Inc.; The First Boston Corp.; Merrill Lynch White Weld Capital Markets Group; and Salomon Brothers, Inc.

$ $ $

Codenoll Technology Corp., Yonkers, N.Y., has filed a registration statement with the Securities and Exchange Commission covering an offering of 450,000 shares of common stock. The offering will be managed by Allen & Co., Inc.

$ $ $

M/A-COM, Inc. has signed an eight-year, $100 million multicurrency revolving-credit and term-loan agreement with five banks, The First National Bank of Boston, Bank of America, the Chase Manahattan Bank, Citibank and Morgan Guaranty Trust Co., with the First National Bank of Boston serving as agent.

$ $ $

Maxtor Corp., Santa Clara, Calif., has completed $4 million in equity and debt funding through a venture capital group led by Bay Partners of Menlo Park, Calif.

$ $ $

Management Assistance, Inc. (MAI) has extended its option to repurchase the 1.3 million shares of MAI common stock owned by Continental Telecom, Inc. to March. 30, 1983.

$ $ $

Standard Oil of Indiana has made a direct equity investment in Numerix Corp., Newton, Mass.

$ $ $

Cullinane Database Systems, Inc. has announced a public offering of 550,000 shares of common stock at $51 per share through its underwriting group, managed by Morgan Stanley & Co., Inc. and Hambrecht & Quist. The firm has also declared a two-for-one stock split, payable on Jan. 19, 1983, to shareholders of record as of Dec. 21, 1982.

$ $ $

Cray Research, Inc. plans to file a registration statement with the Securities and Exchange Commission for a public offering of 750,000 shares of common stock.

$ $ $

Unidata Systems, Inc., of Portsmouth, N.H., has completed its first public stock offering, raising $2.5 million through the sale of 1.2 million shares.

$ $ $

Timeplex, Inc. has filed a registration statement with the Securities and Exchange Commission covering 1.1 million shares of common stock. Montgomery Securities heads up the

$ $ $

Capro, Inc., Garden Grove, Calif., has received first-round venture capital funding from a consortium comprised of First Interstate Capital, Los Angeles; Investech, New York; and United Capital Corp., Ill.

Memorex Cuts Hours for 750

(Continued from Page 107)

ex's Santa Clara assembly plant. The company decided to reduce the hours of all employees rather than lay off a smaller number "because we want them around when things pick up next year," the spokesman said. He did not know how much the company would save as a result of the cutback.

The spokesman expressed optimism that 3680 volume shipments in the third quarter of 1983 would be heavy enough to reinstate the 40-hour work week, saying that European sales of the company's 3690 disk drive, a first-generation thin-film head subsystem, "have been super."

In a related matter, a spokesman for Burroughs Corp., which owns Memorex, said the company will impose a Burroughswide salary and hiring freeze, another move designed to combat the effects of the recession. The hiring freeze will extend down to Memorex, but not the wage freeze, because one has been in effect at Memorex throughout 1982.

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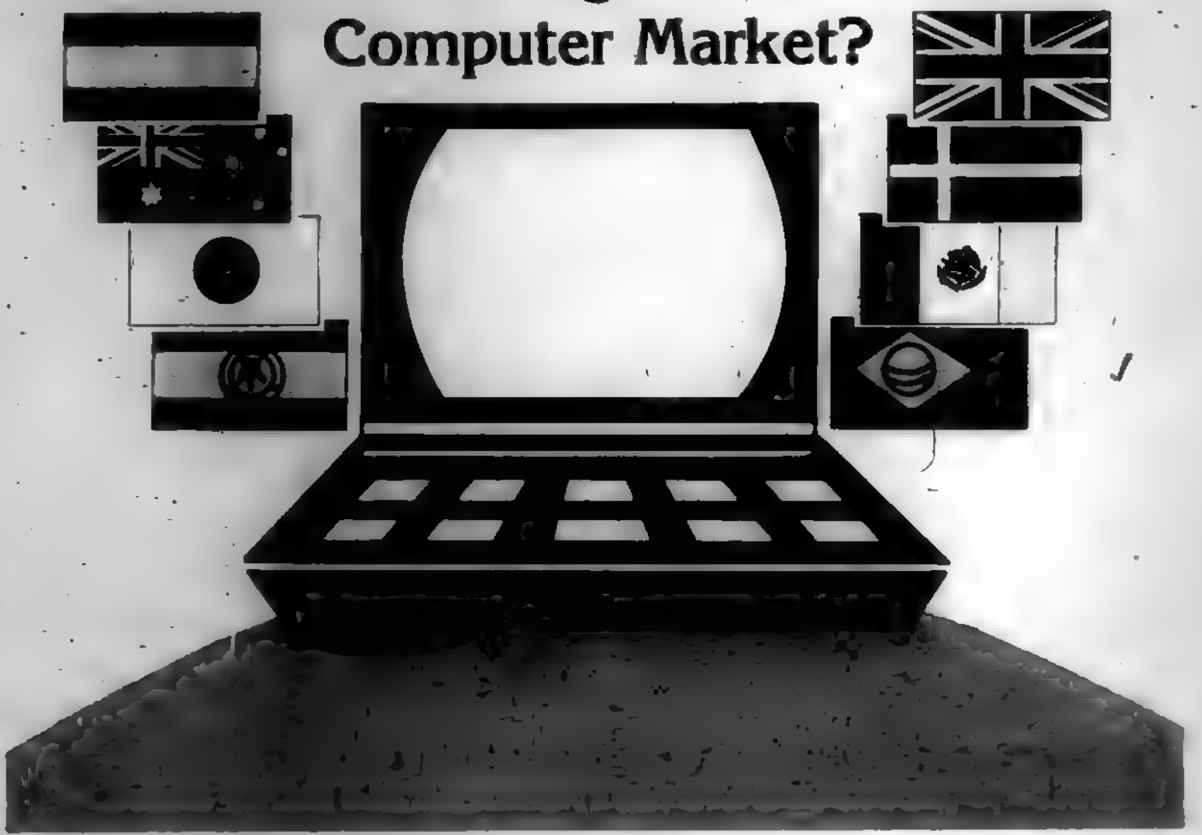

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Our oldest publication is COMPUTERWORLD, a weekly newspaper with a growing all-paid circulation in excess of 117,000 (quite an increase from our modest 7,500 in 1967).

COMPUTERWORLD serves America's computer users with the consumer-oriented, objective information they need. And it has become America's top business/professional publication, measured by advertising revenue.

ISO WORLD is our semi-monthly publication for retailers, dealers, distributors and other independent sales organizations (ISOs) in the resellers marketplace. This is a relatively new marketplace which has grown up around the minicomputer and microcomputer, and which shows every sign of very rapid growth for at least the next decade.

The latest phenomenon of the computer industry is personal and desk-top computers and we're covering it with our newest publication, INFOWORLD. We report from the user's point of view — with product ratings, and information on using small computers in business and at home. It's a paid circulation, weekly newspaper, and the only publication of its type — located right in the middle of Silicon Valley — where it's all happening.

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Executive Corner

- Richard T. Newell has been promoted to vice-president, domestic operations, and William G. Walker to vice-president, finance and administration, at Inforex, Inc.

- Charles Robert Haning has been named vice-president and chief financial officer at Beehive International.

- John P. Jacobson has been appointed vice-president of western operations for Wang Laboratories, Inc.

- Robert A. Fischer has been named president of McDonnell Douglas Automation Co., the computer services division of the McDonnell Douglas Corp.

- Donald Brettner has been named to the newly created position of vice-president, marketing services, for Advanced Micro Devices, Inc., Sunnyvale, Calif.

- Dr. Hossein Moghadam has been named vice-president, engineering, for the Peripherals Division of Pertec Computer Corp.

- William R. Leckonby has been appointed vice-president of marketing at Dialogic Systems Corp., Sunnyvale, Calif.

- Daniel Wald has been named vice-president of engineering at Direct, Inc., Santa Clara, Calif.

- Robert G. Reardon has been named vice-president of sales and marketing for STC Systems, Inc., Waldwick, N.J., a Storage Technology Corp. subsidiary.

- George Guy Zoller has been appointed vice-president of finance for Infotron Systems Corp., Cherry Hill, N.J.

- Norman L. Campbell has been promoted to assistant vice-president, information/word processing services, at Equifax, Inc., Atlanta, Ga.

- William G. Manser has been appointed vice-president of sales for IPL Systems, Inc., Waltham, Mass.

- Thomas F. Cull has been named president and chief operating officer of Interactive Systems Corp.

- R. David Guthrie has been named vice-president of sales for Local Data Co.

- Anthony Holbrook has been promoted to the new post of executive vice-president and chief operating officer at Advanced Micro Devices, Inc. Also promoted were Stephen Zelencik, senior vice-president, sales and marketing; James Downey, senior vice-president, operations; J. Philip Downing, vice-president, corporate technology; R. Clive Ghest, vice-president, product planning and applications; Curtis Francis, vice-president, strategic planning; Eugene Conner, vice-president and group executive; John East, vice-president, Bipolar Division; James Cunningham, vice-president, Advanced Technology Division; and J. David Simpson, vice-president, Information Products Division.

- Greg Pace has been appointed president of two Frank Scott Enterprises affiliates, Interactive Data Communications System and Oakland Financial Group Franchises, both of San Jose, Calif.

- James F. Megletti has been elected vice-president in charge of the Education Plus Division at Software Plus, Inc., Rutherford, N.J.

- Robert R. Bishop has been named vice-president, European operations, at Apollo Computer, Inc., Chelmsford, Mass.

- Joseph P. Ganley has been appointed vice-president, marketing, at Wabash Datatech, Inc., Rolling Meadows, Ill.

- Peter E. Cole has been promoted to vice-president, technical development, for Amnet, Inc., Watertown, Mass.

- James W. Coffey has been appointed to the newly created position of vice-president of marketing for M/A-COM Alanthus Data, Inc., an operating company of M/A-COM, Inc.

- Dennis P. Flanagan has joined Memorex Communications Group as vice-president of marketing. Memorex is a subsidiary of Burroughs Corp.

- Division presidents Thomas J. DeMaio, Network Services; Rick Duques, Brokerage Services; John Hulina, Western region; Robert J. Levenson, Mid-Atlantic region; and David J. Torrence, Dealer Services, all have been named corporate vice-presidents at Automatic Data Processing, Inc., Clinton, N.J.

- James W. Cook has joined Anacomp, Inc. as senibr region vice-president of the Computer Services Group.

O.P.M. Heads Sentenced

(Continued from Page 107)

O.P.M. forged scores of phony computer leases with Rockwell International Corp. to be used as collateral to raise nearly $200 million in loan funds.

The prosecution held that the Rockwell scheme had proven a tried and tested method Goodman and Weissman had practiced throughout the '70s to secure loan proceeds. In essence, the two would either alter legitimate computer leases or create outright forgeries, at times obtaining loans from multiple investment sources for the same piece of leased equipment, prosecutors maintained.

Brushing aside pleas of mercy from lawyers of the pair, who claimed much of the proceeds of the fraud was funneled to charities in the U.S. and Israel, Judge Haight said the massive fraud approximated "a crime of violence." Goodman and Weissman were each released on $250,000 bail pending their incarceration on Jan. 12.

The sentencing memorandum noted that Goodman had implicated five other individuals in the fraud, all of whom had also pleaded guilty last year and were scheduled to be sentenced late last week. Three other men have already been convicted and sentenced for accepting bribes from O.P.M. officials.

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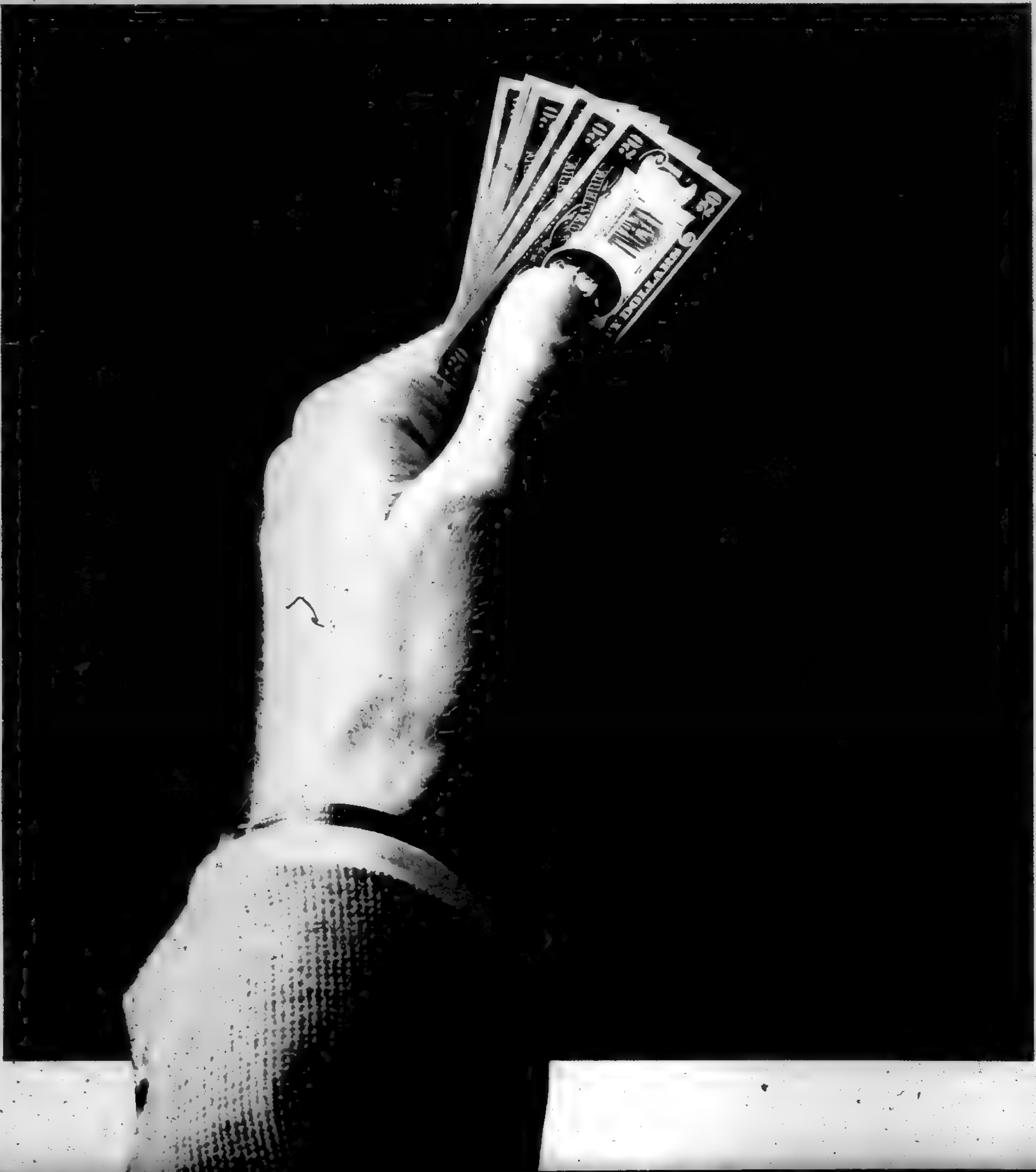

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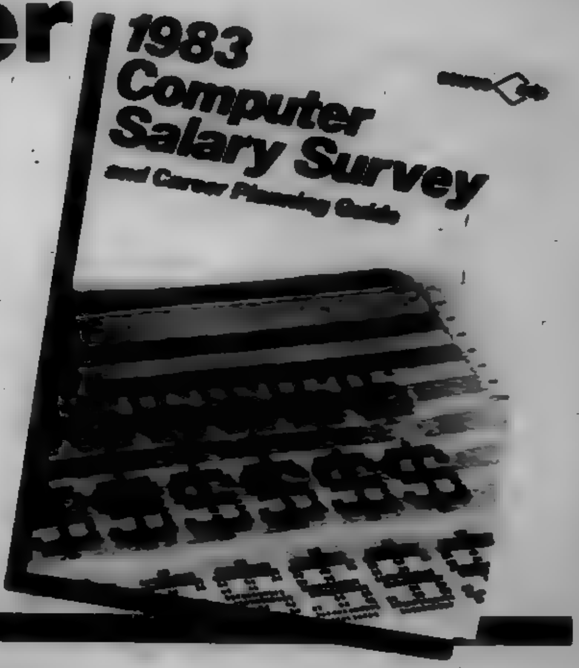

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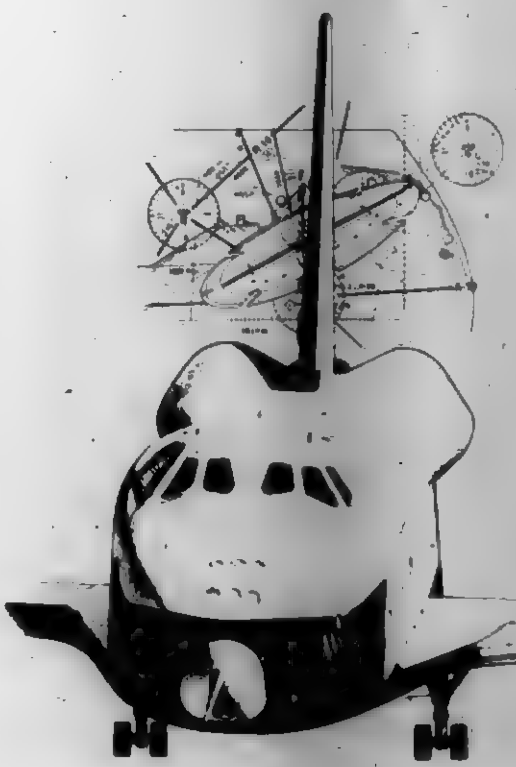

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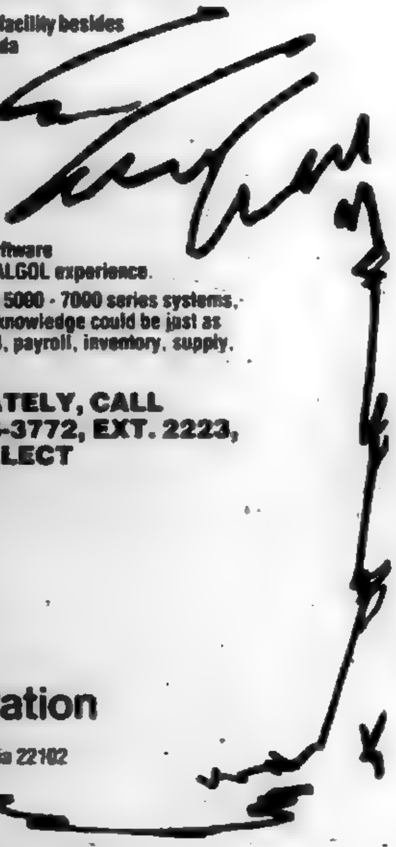

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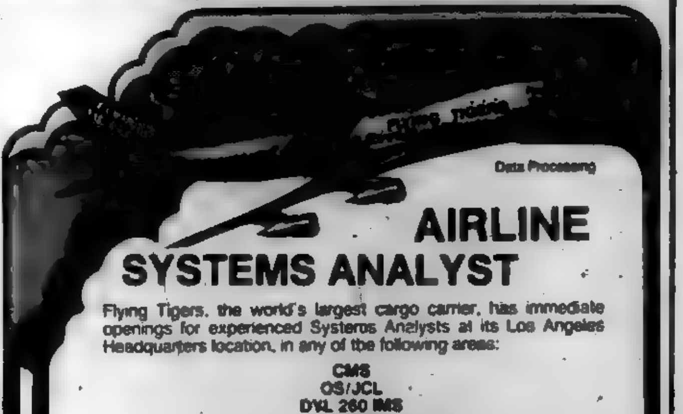

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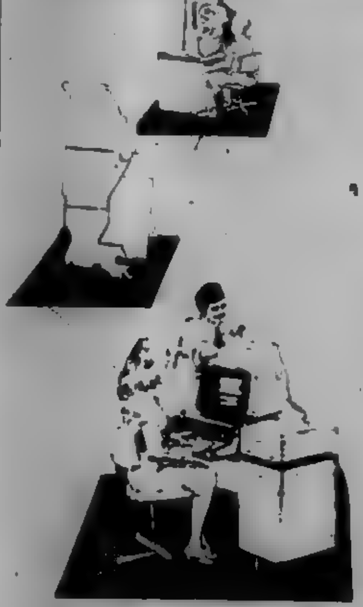

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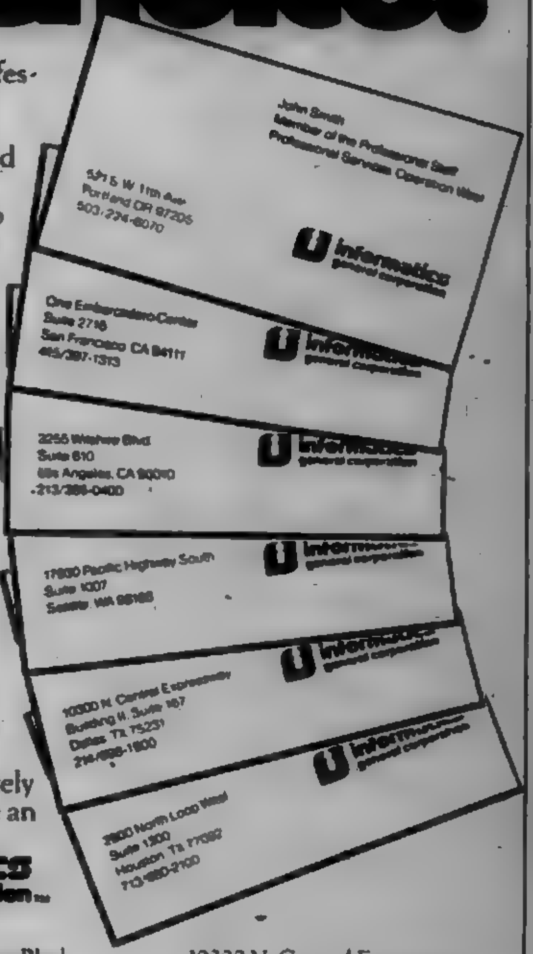

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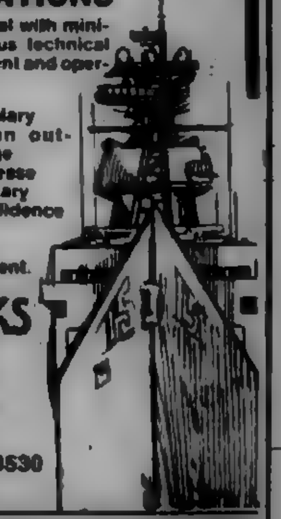

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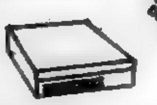

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Request for Proposal Number 814, due Thursday, January 27, 1983, 3:30 P.M., for the acquisition of a software package to run at the State Computer Center, to help the agency in its functions as guarantor of student loans and claims processing.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

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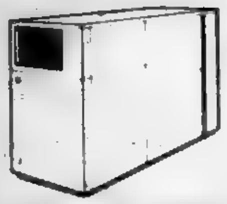

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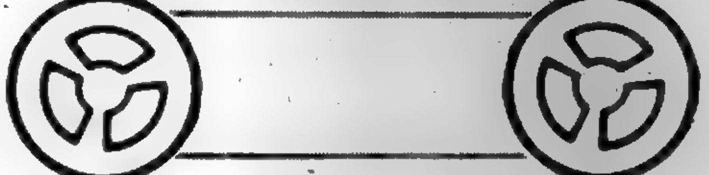

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The Computerworld Bulletin Board -- Our newest addition to the classified pages of Computerworld, this is a low-cost way to buy or sell individual pieces of hardware or software. See below for details on sizes and cost.

Here's the data you need to know to place your ad:

The deadline for classified advertising is ten days prior to the issue desired. (That's six working days prior to the issue date) Ads may be sent in by mail. For camera-ready ads, a velox or negative is required. For ads to be typeset by us, enclose a layout if needed, along with any logos or artwork you would like to include in the ad. These must be dark and clear for reproduction purposes.

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We also provide telecopier service at extensions 410 and 451.

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1 column--1 13/16" or 11 picas
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If you wish a box number to be assigned to your ad, it will cost an additional **$15.00.**

First-time advertisers must send payment along with their ad.

For the ***Computerworld Bulletin Board,*** ads may be sent by mail, by telecopier or given over the phone. Space is available in ***one column by one inch deep units only.*** They are set up using a ***simple format with standard typefaces and no borders or logos are allowed.*** The cost of one standard unit is ***$115.00.*** These units may be combined to form deeper ads.

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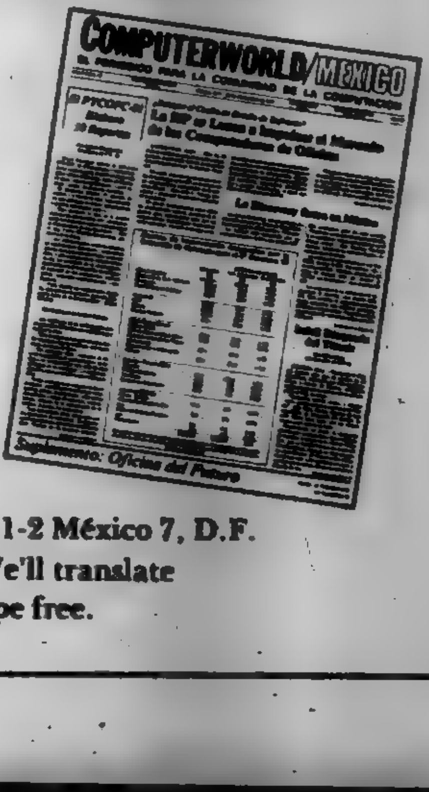
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REFERENCE: R331

Vendors interested in responding to a forthcoming RFP for D. P. CONSULTING SERVICES to augment State expertise are asked to contact

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(203) 566-3304
REFERENCE: R331

CLOSING DATE: Fifteen (15) days from date of this issue

STATE OF CONNECTICUT
REQUEST FOR PROPOSAL
REFERENCE: R326

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CLOSING DATE: Seventeen (17) days from date of the issue

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Bulletin Board ads come in standard units (one column wide by one inch deep) and standard typefaces. (Units may be combined to produce deeper ads, but one column is the maximum width and no units of less than one inch are available.) Ads are arranged under headings (such as "IBM", "DEC" or "Printers"). The headline of the ad is set in larger, bold type, and should contain the standard equipment identification. The body copy should describe the equipment very briefly and give the person to contact. This is all the information an interested buyer needs to follow up. No ad should have more than one piece of equipment or software.

Price for each standard unit is only $115. There is an one unit minimum and no fractional units available.) Anyone can place an ad, but no agency commissions are paid, no quantity discounts allowed, and no credit toward rate is given for contract advertisers who advertise in other sections of Computerworld. It's a simple and effective system for buying and selling hardware and software.

How to Place an Ad in the Bulletin Board.

Ads are accepted in the mail, by phone or by telecopier. Ads can be accepted up until the Monday before issue (7 days in advance of issue date). You should write out your ad before submitting it. (The standard size will hold approximately 25 words of copy.)

Once you've written your ad, send it in with the coupon below or call one of our ad-takers. (If your company has never advertised with us before we request a check with your order.)

Remember that all ads are standard. No special typefaces, no borders and no logos are allowed. Ads are set on a six-column page in our classifed section under the heading "The Bulletin Board.". We assume no liability for errors beyond the price of the ad in the case of material errors.

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Signature: ____________________

Name: ____________________

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Company: ____________________

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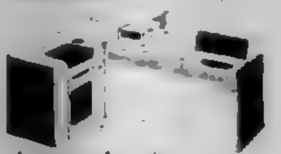

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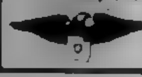

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ADVERTISERS' INDEX

Ad Council.......32
Altos Computer.......60-61
Applied Software Technology.......72
Basic 4.......30
B.I. Moyle Associates.......81
BMC Software.......73
Bunker Ramo.......96
Cambridge Systems.......28
Carelton Corp.......81
CGA.......56
Chubb Institute.......106
Cincom Systems.......47
ComData.......97
Communications Management Research.......6
Computer Associates.......5
Computer Corp. of America.......65
Computeristics.......92
Computer Technology.......111
Computer & Terminal Exchange.......40
Cord Cable Co.......64
Corodale.......96
CS Computer Systems.......66
Cullinane.......84-85
CW Buyers Guide.......58
CWCI.......72
CW International.......112
CW Rolls Royce.......114-115
CW Subscription.......104
CW Supplement.......66
Data General.......50-51
Data Management.......24
Datamation.......106
Dataroyal.......26
Deltak.......34
Digital Engineering.......27
Digital Equipment Corp.......10-11, 113
Rainbow Products / Educational Services
Dow Jones.......70
Duquesne Systems.......93
Dysan Corp.......62
Eastman Kodak Co.......87
EEC.......24
Fusion Products.......60, 88
General Electric Video.......13
Graham Magnetics.......78
Hambrecht & Quist.......106
Human Designed Systems.......19
IBM.......86
Informatics.......14-15, 57
Information Sciences.......108-109
Innovation Data Processing.......9
ISO World.......98
ISSCO.......35
ITT Courier.......49
Jensen.......52
John Beall.......107
Laminex.......11
Lanier Business Products.......22-23
Lee Data Corp.......38, 88
3M Company.......20
Martin Marietta.......71
Mathematica.......94
MCBA.......32
McCormack & Dodge.......144
Memorex.......44-45, 110
Micro Age.......116
Micro Ed.......116
Mohawk Data.......82
MPC.......102
NCR Corp.......100-101
NCR - OEM Marketing.......68-69
Newcorp Products.......63
Newman Computer.......40
Oxford Software.......89
Pace Applied Technology.......64
Popcom.......98
Questronics.......6
Radio Shack.......75
Relational Technology.......80
L.F. Rothschild.......41
SAS Institute.......43
Selenar.......95
Serena Consulting.......14
Sheraton Tara.......80
Signal Technology.......63
Software Results.......80
Solutions.......74
Syncsort.......3
Sysed.......24, 116
Televideo.......76-77
Telex Computer Products.......37
Termtronics.......6
Thomas Computer.......7
Tymnet.......52-53
Viking Associates.......63
Walker Interactive.......31
Western Data Systems.......74
Whitesmith.......46

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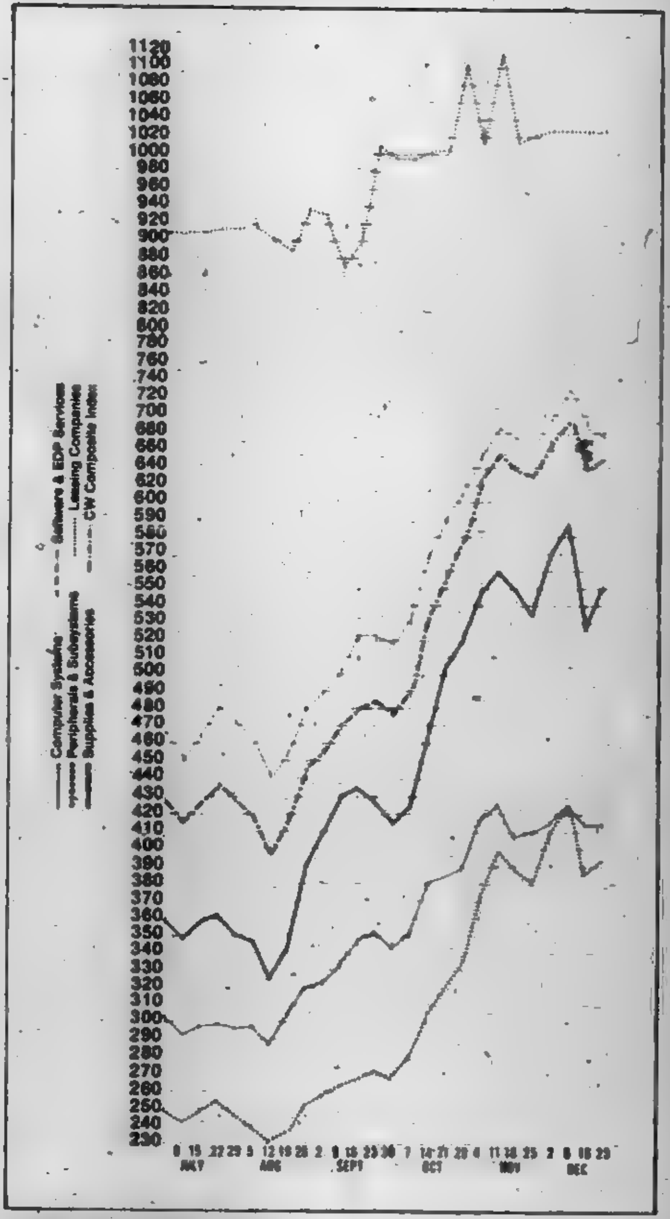

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CLOSING PRICES WEDNESDAY, DECEMBER 22, 1982

All statistics compiled computed and formatted by TRADE QUOTES INC. Cambridge Mass 02139

COMPUTER SYSTEMS

EXCH		1981-82 RANGE (1)	CLOSE DEC 22 1982	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP	17- 33	27 3/4	- 5/8	-2.2
N	BURROUGHS CORP	28- 44	40	+ 5/8	+1.5
O	COMPUTER AUTOMATION	7- 17	15 7/8	+ 7/8	+5.8
N	CONTROL DATA CORP	21- 42	38 1/8	+1	+2.6
N	CRAY RESEARCH INC	20- 45	39 3/8	+1 7/8	+5.0
N	DATA GENERAL CORP	20- 59	39 3/4	+2 7/8	+7.8
N	DATAPOINT CORP	11- 34	18 1/2	+1 1/4	+7.2
N	DIGITAL EQUIPMENT	62-113	96 3/4	+1 3/4	+1.8
A	EECO INC	6- 11	9 1/8	- 5/8	-6.4
N	ELECTRONIC ASSOC.	5- 12	9 5/8	- 1/4	-2.5
N	FLOATING POINT SYST	18- 30	26 1/2	+1 3/8	+5.4
N	FOXBORO	22- 38	33 1/2	- 3/8	-1.1
O	FULCRUM COMP GRP	1- 3	1/4	0	0.0
O	GENERAL AUTOMATION	3- 8	6 1/8	+1 3/4	+40.0
N	HARRIS CORP	20- 43	38 1/4	+1 1/4	+3.3
N	HEWLETT-PACKARD CO	36- 82	75 1/2	+5	+7.0
N	HONEYWELL INC	60-104	88 1/8	+5 1/2	+6.5
N	IBM	48- 96	93 1/2	+4 1/8	+4.6
O	IPL SYSTEMS INC	2- 8	6 1/4	- 3/4	-10.7
O	MAGNUSON COMP SYSTS	2- 16	2 3/4	+ 1/8	+4.7
A	MANAGEMENT ASSIST	7- 18	10 1/4	+ 1/8	+1.2
O	MINI-COMPUTER SYST	1- 4	5/8	+ 1/8	+25.0
N	MODULAR COMPUTER SYS	6- 13	11 1/8	- 1/4	-2.1
N	MOHAWK DATA SCI	10- 18	14	0	0.0
N	NCR	38- 93	87 1/4	+7 1/8	+8.9
N	PERKIN-ELMER	17- 32	27 1/4	+ 3/4	+2.8
N	PRIME COMPUTER INC	16- 38	35 1/2	+1 3/4	+5.1
N	SPERRY CORP	21- 37	31 7/8	+ 5/8	+2.0
O	TANDEM COMPUTERS INC	14- 34	26	+3 1/4	+14.2
N	TEXAS INSTRUMENTS	71-151	137 3/4	+8 3/4	+6.7
A	WANG LABS "B"	25- 63	55	+1 1/2	+2.8
A	WANG LABS "C"	21- 61	58	+4 3/4	+8.8

LEASING COMPANIES

EXCH		1981-82 RANGE (1)	CLOSE DEC 22 1982	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE FINANCIAL CP	22- 28	28 3/4	0	0.0
N	COMDISCO INC	13- 35	34 5/8	+1 3/4	+5.3
O	COMMERCE GROUP CORP	1- 1	1/4	0	0.0
O	COMPUTER INVSTRS GRP	1- 2	3/8	0	0.0
O	CONTINENTAL INFO SYS	5- 20	10 5/8	+ 3/8	+3.6
N	DPF INC	5- 13	8 7/8	- 1/8	-1.3
O	ITEL	1- 9	1 1/2	0	0.0
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	18- 37	34	-1 1/2	-4.2

SOFTWARE & EDP SERVICES

EXCH		1981-82 RANGE (1)	CLOSE DEC 22 1982	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 6	1 3/4	- 1/8	-6.6
O	ADVANCED SYSTEMS INC	9- 18	11 3/4	0	0.0
O	AGS COMPUTERS INC	7- 17	15 3/4	+ 1/4	+1.6
N	ANACOMP INC	9- 18	16 1/2	+ 3/8	+2.3
O	ANALYSTS INTL CORP	9- 11	11	0	0.0
A	APPLIED DATA RES.	16- 48	38 3/8	+ 1	[illegible]
O	ASK COMPUTER SYSTEMS	12- 27	22 1/8	+2 1/4	+11.1
A	ASTRADYNE COMP IND	1- 5	1 3/4	- 1/8	-6.6
N	AUTOMATIC DATA PROC	21- 37	35 3/8	+2 1/2	+7.6
O	CGA COMPUTER ASSOC	5- 9	8 3/4	+ 1/4	+2.9
O	COMPUTER ASSOC INTL	17- 38	35 1/2	- 1/2	-1.3
O	COMPUTER HORIZONS	1- 3	7	- 1/4	-3.4
O	COMPUTER NETWORK	4- 9	7 1/4	- 1/8	-1.6
N	COMPUTER SCIENCES	11- 20	18 1/8	+ 1/2	+2.8
O	COMPUTER TASK GROUP	8- 18	13 3/4	+ 1/4	+1.8
O	COMPUTER USAGE	2- 5	3 3/4	+ 1/4	+7.1
O	COMPUTONE SYSTEMS	13- 30	28 1/4	+3 5/8	+14.7
O	CONSERV CORP	11- 26	18 3/4	0	0.0
O	COMSHARE	5- 10	5 5/8	+ 1/8	+2.2
N	CULLINANE DATABASE	24- 53	47 3/4	+ 3/4	+1.5
O	CYCARE SYSTEMS INC	9- 18	14 3/4	- 3/4	-4.8
O	DATA DIMENSIONS INC	1- 3	1/4	0	0.0
O	DATATAB	0- 4	3/8	- 1/8	-25.0
O	DYATRON CORP	2- 4	2 7/8	- 1/4	-8.6
N	ELECTRONIC DATA SYST	18- 50	45 3/4	+ 3/4	+1.6
O	INFORMATICS INC	10- 28	20 1/2	-1 3/8	-6.2
O	INSYTE CORP	1- 3	1 3/4	+ 1/8	+7.6
O	IPS COMPUTER MARKTI.	1- 2	1 1/4	0	0.0
O	KEANE ASSOCIATES	4- 9	5 1/4	0	0.0
A	LOGICON	12- 29	27 5/8	+ 1/8	+0.4
O	MNGT SCI AMER INC	17- 42	18 3/4	-18	-48.9
O	MATHEMATICA INC	12- 18	15 3/4	-1 1/4	-7.5
O	MATHEMATICAL APP GRP	12- 18	13 1/2	-1	-6.8
O	NATIONAL DATA CORP	12- 26	22 3/4	0	0.0
O	PANSOPHIC SYSTEMS	8- 20	17 3/4	+ 1/2	+2.9
N	PLANNING RESEARCH	8- 11	10 1/8	+ 1/4	+2.5
O	PROGRAMMING & SYS	1- 3	2 7/8	+ 1/4	+9.5
O	REYNOLDS & REYNOLD	17- 28	27 1/2	+1	+3.7
O	SEI CORP	21- 41	40	+ 1/4	+0.6
O	SHARED MEDICAL SYST	26- 54	51 7/8	+1 1/8	+2.2
O	SCIENTIFIC COMPUTERS	8- 13	10 1/4	- 3/4	-6.8
O	SOFTWARE AG	5- 17	11 3/4	+ 1/4	+2.1
N	TYMSHARE INC	12- 30	17	-1 1/2	-8.1
A	URS CORP	10- 19	14 1/2	0	0.0
N	WYLY CORP	7- 13	8 1/8	-1 3/8	-13.0

PERIPHERALS & SUBSYSTEMS

EXCH		1981-82 RANGE (1)	CLOSE DEC 22 1982	WEEK NET CHNGE	WEEK PCT CHNGE
N	AM INTERNATIONAL	1- 15	5 3/8	- 1/8	-2.3
A	ANDERSON JACOBSON	9- 26	23	0	0.0
O	AUTO-TROL TECHNOLOGY	8- 18	14	-1	-6.6
O	BANCTEC INC	7- 33	15	+2	+15.3
A	BEEHIVE INT'L	4- 9	8 7/8	+ 1/4	+2.8
A	BOLT, BERANEK & NEW	8- 34	32 3/4	- 3/8	-1.2
O	CAMPEX CORP	2- 4	2 1/8	+ 1/8	+6.2
N	CENTRONICS DATA COMP	6- 17	13 1/4	- 1/4	-1.8
A	CETEC CORP	4- 8	5 1/2	- 1/8	-2.2
O	COGNITRONICS	2- 8	6 1/4	+ 5/8	+11.1
O	COMPUTER COMMUN.	1- 2	3/4	0	0.0
A	COMPUTER CONSOLES	15- 39	37 3/4	+3 1/8	+9.0
O	COMPUTER DEVICES INC	4- 21	10 3/8	- 1/8	-1.1
O	COMPUTER TRANSCEIVER	4- 9	4 1/8	- 1/4	-3.9
N	COMPUTERVISION CORP	18- 38	34	+1 1/4	+4.3
N	CONRAC CORP	21- 38	32 1/4	- 5/8	-1.9
A	DATA ACCESS SYSTEMS	2- 5	1 3/4	0	0.0
A	DATAPRODUCTS CORP	16- 35	32 1/8	+1 5/8	+5.2
A	DATARAM CORP	5- 10	9 3/8	+ 1/8	+1.3
O	DATUM INC	2- 9	4 1/4	+ 5/8	+17.2
O	DAVID JAMISON CARLYL	2- 7	2 3/8	0	0.0
O	DECISION DATA COMPUT	3- 14	12 1/8		0.0
O	DELTA DATA SYSTEMS	2-	2 1/4	0	0.0
N	ELECTRONIC M & R	5- 8	6 5/8	+ 3/8	+6.0
O	EVANS & SUTHERLAND	18- 48	42 1/2	- 7/8	-2.0
O	GANDALF TECHNOLOGIES	10- 22	16 5/8	+1 5/8	+10.8
N	GEN'L DATA COMP IND	6- 18	17 1/2	0	0.0
O	GENERAL TERMINAL CP	0- 4	1/2	0	0.0
O	GREAT SOUTHWEST IND	3- 9	2 1/2	0	0.0
N	HAZELTINE CORP	22- 43	38 5/8	- 3/8	-0.8
O	ICOT CORP	3- 8	8 1/8	+ 3/8	+4.8
O	INFORMATION INTL INC	10- 22	15 3/4	+ 3/4	+5.0
O	INTEL CORP	21- 42	38 1/2	+4 3/4	+13.6
O	IPL SYSTEMS INC	5- 9	6 1/4	- 3/4	-10.7
N	LUNDY ELECTRONICS	7- 14	12	0	0.0
A	MAI DATA CORP	14- 28	28	+3 1/8	+12.5
O	NETWORK SYSTEMS CORP	19- 30	28 1/2	+3 1/2	+14.0
O	OMEX	3- 8	3	0	0.0
N	PARADYNE CORP	24- 50	37 1/4	-4 5/8	-11.0
A	PENRIL CORP	7- 12	9 3/4	- 1/8	-1.3
O	QANTEX CORP	12- 20	14 1/2	- 3/4	-4.9
N	RECOGNITION EQUIP	4- 10	8 7/8	+ 1/2	+5.9
O	SCAN DATA	1- 5	1 1/4	- 1/4	-16.6
N	STORAGE TECHNOLOGY	16- 40	24 1/4	- 1/2	-2.0
O	SYKES DATATRONICS	6- 34	10 1/8	+ 1/4	+2.5
A	T BAR INC	7- 11	9	+ 7/8	+10.7
A	TEC INC	3- 12	10 7/8	+ 1/4	+2.3
N	TEKTRONIX INC	34- 61	56 1/4	+1 1/4	+2.2
N	TELEX	9- 27	23 1/8	+1 5/8	+7.5
O	TEGDATA SYSTEMS CP	3- 10	8	0	0.0
A	TIMEPLEX INC	7- 18	17 3/8	+1 3/4	+10.8
O	VISUAL TECHNOLOGY	9- 17	15 1/8	+1 3/4	+13.0
O	WILTEK INC	1- 3	1 3/8	- 1/8	-8.3

SUPPLIES & ACCESSORIES

EXCH		1981-82 RANGE (1)	CLOSE DEC 22 1982	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN BUS PRODS	11- 18	17	+ 1/2	+3.0
O	BALTIMORE BUS FORMS	1- 2	1 1/4	0	0.0
N	BARRY WRIGHT	13- 22	22 1/4	0	0.0
O	CYBERMATICS INC	1- 1	7/8	0	0.0
A	DUPLEX PRODUCTS INC	12- 20	17 1/4	-1 1/8	-6.0
N	ENNIS BUS. FORMS	18- 30	23 1/4	-3 3/4	-12.0
N	3M COMPANY	48- 78	74	+3 7/8	+5.5
N	MOORE CORP LTD	30- 41	41 1/8	+ 7/8	+2.1
N	NASHUA CORP	8- 19	12 1/8	- 1/4	-2.0
O	STANDARD REGISTER	35- 72	70	0	0.0
A	TAB PRODUCTS CO	12- 24	23 7/8	+2 1/4	+10.4
N	WALLACE BUS FORMS	22- 50	45 1/4	+ 3/4	+1.6

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NEWSPAPER

DPMA Gives Thumbs Up to Cobol Standard

By Lois Paul
CW Staff

CHICAGO — The Data Processing Management Association last week withdrew its strong objections to the American National Standards Institute's proposed Cobol standard, citing the responsiveness of Ansi's X3J4 subcommittee to its comments about the changes to the language.

DPMA's withdrawal of its objections was a reversal of its previous stance on the proposed Cobol standard. Over a year ago, the organization came out firmly against Cobol 80 [CW, Oct. 26, 1981], leading opposition against the proposed standard on behalf of the more than 30,000 DP managers it represents nationwide.

The organization's change in position was the result of the receipt and subsequent review of an X3J4 mailing that was sent last week to the approximately 2,300 individuals who submitted comments about Cobol 80. The package, Document No. X-785, responds to all comments received about Cobol 80 and details their disposition. It also includes a 55-page "Rationale for Cobol Revision Changes," which addresses the question of up-

(Continued on Page 7)

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper

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Harris Adding Two Machines To Rival VAX

By Susan Blakeney
CW Staff

FORT LAUDERDALE, Fla. — Harris Corp. is slated this week to announce two additions to its high-end computer system line that feature extended memory, additional I/O peripherals and reportedly more configuration flexibility than present offerings. The H800-2B and H800-2BP were built to compete head-on with Digital Equipment Corp.'s VAX-11/780 supermini.

Harris will also announce an Integrated Memory Subsystem that combines a controller and array memory on a single board. The Integrated Memory Subsystem is included as part of the new processors, but can be purchased separately for use with other Harris computers (story on Page 4).

(Continued on Page 4)

CW Illustration

Wrong

The woolly caterpillar, the *Farmer's Almanac* and all the people who predicted that this winter would be a frigid one were wrong. The computer was right. Story on Page 9.

FCC Decision to Alter Dial-Up Service Fees

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Charges for dial-up communications services will be altered drastically in 1984 by a decision the Federal Communications Commission made last month.

The FCC established a new method of paying local telephone companies for the local-loop facilities they attach to the ends of interstate circuits. As a result, the monthly charges levied by these phone companies on their business customers are likely to increase up to $30 per line next year.

Interstate carriers currently pay all local-access charges and are reimbursed by their customers. Under the new system, each telephone network user will be billed directly by his local telephone company for roughly half of the Non-Traffic-Sensitive portion of the local-access charge.

The carriers will pay the rest of the Non-Traffic-Sensitive portion as well as the traffic-sensitive portion of the local-access charge, plus a subsidy to help cover the higher costs of extending telephone service into sparsely populated rural areas.

The Non-Traffic-Sensitive portion is the largest part of the local-access charge. It covers the local loop plus attached terminal equipment and inside wiring if leased from the telephone company. Beginning in 1984, business users will pay a minimum flat-rate charge each month of $4 per line, plus a usage-based fee of up to $26 per line, to cover the 50% of Non-Traffic-Sensitive costs that will be charged to them directly.

In 1985 and subsequent years, all Non-Traffic-Sensitive charges, including those levied initially on the carriers, will be shifted gradually to a flat rate imposed on the user. The flat rate then will be increased 20% annually.

Although the charges to be imposed next year will increase the user's payments to his local telephone company, the carriers offering Message Toll Service (MTS) and Wats are likely to reduce their rates. It is unclear, however, whether this de-

(Continued on Page 6)

After Testing a T/S Version at 100 Sites

Comshare Announces DSS for IBM Users

By Lois Paul
CW Staff

ANN ARBOR, Mich. — After testing a time-sharing version of a decision support system for IBM and plug-compatible mainframes running under VM for nine months at more than 100 user sites, Comshare, Inc. today unveiled a stand-alone version of the product, System W.

System W is the central component of several packages:

- System W Plus supports nine dimensions and 2,000 members per viewpoint.
- System W Distributed includes System W plus the data communications and error-checking capabilities necessary to support Micro W, a version of the decision support system for IBM Personal Computers and Apple Computer, Inc. microcomputers.

System W can be run on IBM 4331 systems with at least 2M bytes of memory running under VM/CMS. It requires 125K bytes of actual memory per user.

The basic System W software is a multidimensional decision support system intended to allow users to handle multiple products, locations, companies or market sectors one at a time or all at once. It supports the use

(Continued on Page 4)

CICS Users Come Down Hard on 'DMS'

By Paul Gillin
CW Staff

NEW YORK — CICS users expressed disapproval of IBM's Development Management System (DMS) on-line application development package in a dramatic and decisive fashion at a CICS users group conference here recently.

Prompted by a question from a member of the audience, only a fraction of the DMS users present indicated that they were pleased with their IBM package.

The exchange came at the conclusion of IBM representative Ron Wilkins' DMS pitch to more than 150 members of the CICS Users Group, which is sponsored by Teltech Systems, Inc. Wilkins had just opened the floor for questions when Stanley Gordon, a consultant for LTI Consulting Services in New York, seized the microphone and asked the attendees, "How many of you are currently using DMS?"

About 35 hands went up. "Now, how many of you are satisfied with DMS?" Gordon continued. About a half-dozen hands greeted the question. "Thank you," Gordon said and sat down.

The exchange highlighted dissatisfaction that DMS users have expressed recently with the IBM appli-

(Continued on Page 6)

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Please address all correspondence to the appropriate department at Box 880, 375 Cochituate Road, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153.

OTHER EDITORIAL OFFICES:

New York City: Suite 7G, 401 East 80th St., New York, N.Y. 10021 Telephone (212) 570-2135

West Coast: 257 Lytton Ave., Palo Alto Calif. 94301 Phone (415) 328-4064

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Monitoring by Soviets Feared

Customs Warns Agents on Security

By Jim Bartimo
CW Staff

SAN FRANCISCO — Fear that Soviet spy ships are monitoring its telephone, radio and data communications has led the U.S. Customs Office here to release an internal memo warning 41 of its special agents to step up their security measures.

There is also some suspicion that the Customs Office's Treasury Enforcement Communications System (Tecs) has been monitored. Tecs is the agency's data base system that has remote terminals in ports of entry around the country.

Tecs "holds computer information on drug trafficking, stolen vehicles and other export information," customs spokesman Mike Fleming said. "It's a law enforcement intelligence system. It's tied into [the Federal Bureau of Investigation's] National Crime Information Center."

The Customs Office, located near Silicon Valley, Calif., has been active in Operation Exodus, the Customs Office crackdown on the illegal export of high-tech equipment to Eastern Bloc countries and the USSR [CW, March 1]. The project has been stepped up in recent months with an increased budget.

Intelligence Warning

According to the Customs Office's Fleming, "We've been in touch with an intelligence agency" that warned that the agency's communications may be monitored. The agency sent a memo last month to its special agents, which Fleming paraphrased as saying, "In the words of the sergeant on *Hill Street Blues* — 'Let's be careful out there.' "

A spokeswoman for the Customs Office in Washington, D.C., Christine Frazer, said, "We have to assume that the Soviets are monitoring our phone lines." In order to make calls that are not monitored, "we can go through the teletype or the FBI, and we do have some secure phone lines," she added.

Some of the Customs Office's phone and radio transmissions are equipped with voice security systems that break up voice messages and decode them upon receipt, Special Agent Thomas Boyd said. "That equipment is very expensive."

An $8 million emergency funding bill in 1982 and a $20 million budget for 1983 will allow Operation Exodus to afford more of these voice security systems, Frazer noted. "It's just a matter of time before all the phone lines are secure."

Operation Exodus has yielded 765 seizures of improperly licensed or otherwise illegally exported equipment worth $55.6 million. The seizures have resulted in 30 completed criminal cases and 70 convictions.

Lecht Becomes CW Columnist

Charles P. Lecht joins *Computerworld* this week as a regular columnist. His column, "Lecht on Science," will cover wide-ranging issues in computer news and technology and will appear every other week on the Op-Ed page.

Lecht, who is president of Lecht Sciences Inc., a New York-based think tank specializing in computer and communications technologies, has been involved with informatics and the computer industry for three decades. In 1962 he founded Advanced Computer Techniques (ACT), a software firm specializing in programs for business, government and the military. Last fall he resigned as chairman of the board of ACT to found Lecht Sciences.

Free of the constraints of directing a full-time business, Lecht, along with a few colleagues, now plans to write, speak and think about technological implications for the future.

Lecht received a B.S. degree in mathematics from Seattle University and an M.S. degree in mathematics from Purdue University. He maintains a heavy schedule of speaking engagements and consulting assignments and has written five books, most notably *The Waves of Change: A Techno-Economic Analysis of the Data Processing Industry*, published by McGraw-Hill in 1977. He is currently working on a sixth book, tentatively titled *The Technology Vector* and scheduled for publication by Prentice Hall this fall.

Charles P. Lecht

This Week

IN DEPTH
Politics and System Justification . . . . Follows Page 52
Usability: User Documentation ID/11

NEWS
'System W' User Looked for Ease of Use, Training . . 4
Honeywell Introduces Five Financial Packages 5
CICS Users List Application Development Goals 6
'Info/Management' Malcontents Called Few 7
DP Turnover Blamed on Lack of Career Paths 8
Weather Service to Caterpillars: 'Told You So' 9
Program Gets Management to Listen to DPers 10
WP Typists at Ford Named in Betting Operation . . . 11
Laywers: Seek Legal Aid During Contract Talks . . . 12
Bank DPers Get Interest Reporting Reprieve 13
Future DBMS Seen Handling Symbols, Graphics . . 14
Managers on the Move 15
FCC Rules on Customer Premises Equipment 16
Senate Panel Criticizes Computer Matching 17
Attorney: More Privacy Legislation Necessary 18
Exec Sees More Rewards in Management DP 19
Data Analysis Called Key to Info Engineering 20
Researchers to Probe CRT Effects on Women 21
Winners Misdealt at Tournament 22

EDITORIAL
Editorial: Time for a Change 26
Lecht on Science: New Views on Systems 27
Human Connection: Salary Differentials 27

SOFTWARE & SERVICES
Preconversion Planning Struts Its Stuff 31
'Mapics' Users Get Three Modules 32
Seven-Step Plan Aids Conversion 34
Conference Facility Released 35
Packages Released for PE 32-Bit Processors 38
Security Package Out for Honeywell's DBMS 39
'DMS/HP' Released for HP 3000 Users 40
CCS Unveils Four HP 1000 Aids 44
'Vue' Enhanced for DEC, HP Units 45
'Ease2' Out for DG MV Line 46

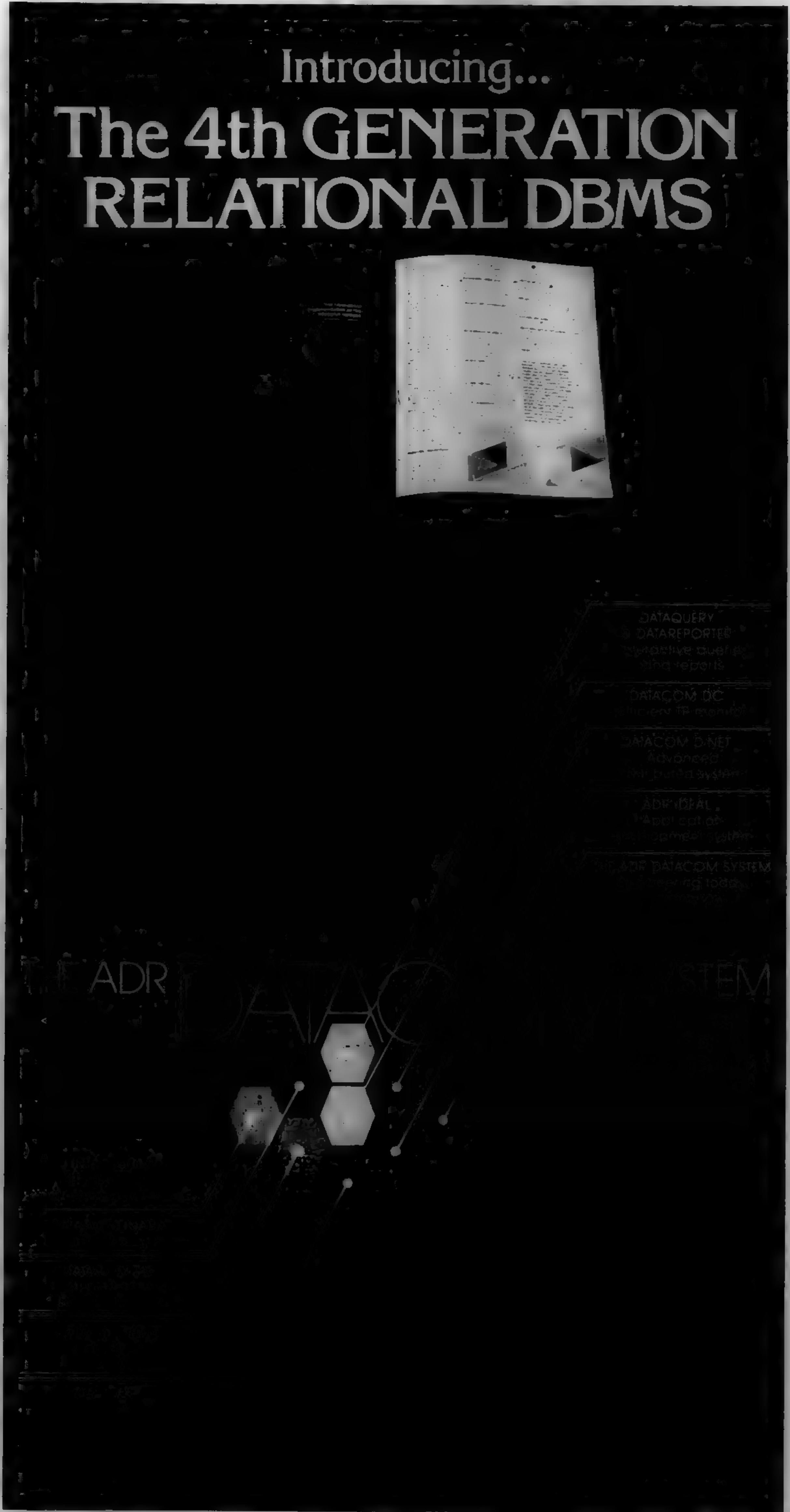
COMMUNICATIONS
No Clear-Cut Winner in Local Nets, Says Report . . 49
Tri-Data Unveils Modem 50
Ansi-Compatible Unit Can Be Tailored by User 52

SYSTEMS & PERIPHERALS
Big Firms Up Micro Disk Use: Report 53
Xerox Manufacturing System Targets IBM Users . . 54
CAD/CAM Turnkey Unveiled 55
Anvil-4000 Fits DG MV 32-Bit Line 56
DG Viking, CRS-55 Get Printers 57
Onyx Unveils Micro-Based Units 58
Data Collection, Control System Unveiled 59
Tape Drive Series Released 62

OFFICE AUTOMATION
Planet Token Ring Series Out From Racal-Milgo . . . 63
DEC Offers Aids for VAX-11/750, /780 Users 64

COMPUTER INDUSTRY
IBM Buy-In of Intel Called Industry Coup 65
Court Decision Seen as Win for Software Firms . . . 65
OA Budgets to Increase 20% This Year: IDC 66
Leasing Funds Available: Dealers, Financiers 67
IBM Offers $50,000 Reward 68
IBM Leader Dead at Age 71 69

ADVERTISING INDEX 100



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CW1/10

Comshare DSS For IBM Users

(Continued from Page 1)

of four dimensions and over 1,000 members per viewpoint.

System W reportedly also lets users produce reports with any of the dimensions of the model anywhere on the page, the vendor noted. Numbers can be printed in any format.

Text, numbers and other information can be mixed, and any dimensions of the model can be extended in a report to produce new groupings and can form rows or columns.

System W reportedly handles currency conversions and allocation of overheads automatically. Variables can be added or changed as necessary, the vendor said, and new dimensions can be added if required. System W will automatically restructure whatever is necessary to ensure the integrity of the model.

The software has a "what if?" sensitivity testing and goal-seeking capability that extends to all dimensions of the model, the vendor said, adding that all changes can be made on a temporary or permanent basis.

Micro W is intended for distributed decision support and addresses the need for a two-dimensional modeling capability in the hands of decision makers and their staffs, the vendor said. A model written on Micro W reportedly is totally compatible with the mainframe version of System W. Users can move a model to the mainframe from the micro and run it without modification when more processing power is needed.

Building a model on Micro W is done by proceeding through a series of menus displaying System W commands, similar to the way models are built on the mainframe version, the vendor added.

According to Kevin O.N. Kalkhoven, group vice-president of marketing for Comshare, Micro W minimizes rounding errors often encountered when mainframe software is transferred to micros. He said Micro W was designed not as a stand-alone micro package but as a distributed decision support system.

"I don't say it is as fast as [Visicorp's] Visicalc, but it is designed to do something different," he added.

With its Investigate command, Micro W goes into a "calc-like" mode, he continued, in which it is a spreadsheet with the capability of handling 7,000 to 10,000 cells. Kalkhoven stressed that Micro W can be run as a total modeling language rather than just as a spreadsheet.

Micro W includes an optional set of materials for computer-aided instruction of new users. Available for $1,500, this is comprised of 16 hours of training. The basic course is eight hours of training, available on a floppy disk to be run only on a personal computer. Day 2 of the training is an additional eight hours, which develops more complex topics such as viewpoints.

The core system is available for $55,000. System W Plus is priced at $75,000. System W Distributed costs $80,000, which includes two copies of Micro W. Additional copies of the latter are priced at $995 each.

Comshare is at Wolverine Tower, 3001 S. State St., Ann Arbor, Mich. 48104.

One of First 'System W' Users Looked for Ease of Use, Training

By Lois Paul
CW Staff

DENVER — When your user community has virtually no programming background nor any desire to gain computer expertise, the last thing you need is a complex decision support system (DSS).

That situation led Neil Williamson, a senior consultant with Fox & Co., a national accounting firm here, to pinpoint ease of use and training as the primary requirements for a DSS. Along with Fox's familiarity with Comshare, Inc.'s time-sharing network and products, it also led Fox to be one of the first domestic users of System W, the DSS formally announced today by Comshare (story on Page 1).

Fox began using the time-sharing version of System W last April; today, 30 to 40 users are up and running on the software. Although Fox is not yet employing Micro W, the company recently acquired an Apple Computer, Inc. Apple III microcomputer. As compatible micros are added, Fox will begin using the micro version of System W, Williamson said.

A move to the in-house version of System W, which runs on VM-based IBM and plug-compatible mainframes, is not anticipated at Fox. Most of Fox's in-house hardware consists of minicomputers that will not support the stand-alone version of the product.

A number of DSS packages to which Fox has access via time-sharing — Tabol from General Electric Information Services Co.; Boeing Computer Services Co.'s Executive Information Services; Nomad II from National CSS, Inc.; and FCS-EPS from EPS, Inc. — were reviewed before Williamson's group chose System W.

System W was considered more appropriate partly because of its English-language orientation. "As intermediary users, we are just developing models to apply to situations of our clients. Generally, our client doesn't realize we are using a computer. The client only wants to see the bottom line," Williamson said.

In terms of training, System W has fared better than some other modeling languages his firm has used, Williamson added. Several people in his office spent a week training to use FCS-EPS, he said, but then shied away from using it. He attributed this to a general fear of computers and the complexity of the language.

System W has required a day and a half of training at Fox, according to Williamson. His firm was trained before the self-teaching tapes became available.

With little prompting, novice users begin to do simple applications and models with little support or supervision, Williamson said. "We wanted something that would be self-generating, that would become natural to use and would not be a pain and a challenge in and of itself. We are very impressed with that."

System W's use of viewpoints "allows incredible flexibiity in defining relationships between groups of data and functions," he explained. For example, Fox used the software to create a model to handle cash flow projection for a client's real estate development project. The client corporation is broken down into five divisions, within which are several products. These are single-family homes, condominiums and townhouses, which are broken down further into types. In addition, there are cost features, and an overlaying consolidation of the hierarchy involves time features.

Working with these complex interrelationships, Williamson's group used viewpoint members to reduce the number of variables and simplify the rules. For example, it employed a viewpoint member for condominium and townhouses. Variables such as unit cost or unit sales value could be applied as needed to the same viewpoint. This allowed flexibility in inputting data and simplified the equations that were used.

When clients wanted to review the relationships used in the model, he said, it was surprisingly easy to extract that information using the power of viewpoints. "We did basically in three days a very, very large complex model that we couldn't have done in earlier times if we had to use other modeling languages," he said.

Harris Adds VAX Rivals to Its High End

(Continued from Page 1)

The H800-2B and H800-2BP are reportedly capable of supporting up to 128 concurrent users each and performing interactive program development, time-sharing, multistream batch, multiple remote job entry and real-time processing. The H800-2BP, Harris' highest performance virtual memory supermini, also has 6K bytes of bipolar cache memory, a spokesman said.

Like other Harris systems, the H800-2B and H800-2BP incorporate an integral hardware floating-point processor and a 48-bit architecture, with pipeline and parallel processing. However, they occupy just one-third the floor space of previous H800 machines, the spokesman claimed. Because of their construction, each system can be housed in a single compact cabinet, along with its accompanying disk drive and magnetic tape units.

The H800-2BP will be offered at a price similar to or lower than the VAX-11/780, but it provides approximately 30% more performance, according to Harris. The H800-2B reportedly offers performance equal to the 11/780 but costs about 15% less.

Both systems incorporate as standard equipment Harris' recently announced Communications Network Processor (CNP). The CNP, designed to relieve the CPU of performance degradation due to terminal load, supports communications via asynchronous, synchronous, isosynchronous and X.25 protocols [CW, Aug. 2]. It supports up to 16 communications lines, each of which can concurrently support a different protocol at different speeds and can be used for either remote or local connections, the vendor said.

The price of the H800-2B begins at $139,000. The 2B is field-upgradeable to a 2BP for an additional $35,000. H800-2BP prices start at $164,000.

The two systems are slated for shipment in March from Harris' Computer Systems Division, 2101 W. Cypress Creek Road, P.O. Box 6200, Fort Lauderdale, Fla. 33310.

Subsystem Available Separately

FORT LAUDERDALE, Fla. — The Integrated Memory Subsystem that Harris Corp. will announce later this week is included as part of the new H800-2B and H800-2BP processors, but can be purchased separately for use with other Harris computers.

The Integrated Memory Subsystem combines memory controller functions and memory arrays on a single board. The subsystem does this by incorporating an Integrated Disk Controller that combines the functions of an I/O channel and a disk controller on a single board. The Integrated Disk Controller supports up to four disks, according to the vendor.

The Integrated Memory Subsystem can be configured for up to 12M bytes of real memory. It has a typical access time of 250 nsec and a cycle time of 335 nsec for 48 bits of data, a Harris spokesman said.

Large-scale integration technology has been incorporated into the Integrated Memory Subsystem for error detection and correction. The board is said to be capable of detecting and correcting all single-bit errors and of detecting all two-bit and most three-or-more-bit errors. Error correction is possible on 48-bit memory accesses, the vendor said.

As a guard against random failure due to alpha particle radiation, the Integrated Memory Subsystem also performs rewrite operations on all correctable errors. The memory also has error-logging capability and the ability to force memory errors for testing purposes.

The memory's design reportedly saves one slot in the CPU chassis. It is currently available in several memory sizes, including a 384K-byte version, which costs $9,000; a 768K-byte model for $12,500; or 1.5M-byte model priced at $18,500. The memory is compatible with the full line of Harris superminis.

The subsystem is available from Harris' Computer Systems Division, 2101 W. Cypress Creek Road, P.O. Box 6200, Fort Lauderdale, Fla. 33310.

Honeywell Introduces Five Financial Packages

By Lois Paul
CW Staff

WALTHAM, Mass. — Five on-line financial planning and management software packages for its large-scale Level 66, Level 66/DPS and DPS 8 processors and its recently announced very large-scale DPS 88 systems running under Gcos and Gcos 8 were introduced here by Honeywell, Inc.

The five packages are the Honeywell Financial and Corporate Planning System (HFCS), the Honeywell Cashflow Management System (HCMS) and on-line versions of the firm's existing accounts receivable, accounts payable and general ledger batch systems, which are said to be fully compatible. The five packages can reside on the same computer system or be purchased and installed separately, Honeyell said.

HFCS allows the user to build a financial model of a company, including "what if" analyses that can test the effects of such variables as increased volumes, different tax rates, inflation and new investments. Optional modules include HFCS Hierarchical Consolidation, which reportedly consolidates data from multiple product lines or divisions in a simple aggregate manner or according to a company's hierarchical structure; and HFCS Risk Analysis, which helps the user evaluate the uncertainty of forecasts associated with a plan, using the Monte Carlo method, to arrive at the most valid probability distributions.

HCMS is a terminal-oriented application that provides a structured approach to planning and controlling a company's investment and borrowing programs up to 18 months in the future, according to Honeywell. Information is maintained on future cash requirements, payroll deduction data, cash projections and the estimated and actual amounts for major revenue and expenditure categories for up to 99 different funds. Each fund can be maintained individually or combined with any or all others in developing forecasts.

Online Accounts Receivable, Accounts Payable and General Ledger are said to provide additional flexibility and functionality for Honeywell's batch versions of these packages, which are prerequisites for their usage.

HFCS carries an initial license fee of $43,000, plus an annual support fee of $5,160. The Hierarchical Consolidation Option and Risk Analysis Option each have an initial license fee of $6,000, plus $720 each for annual support.

HCMS carries an initial license fee of $15,000, plus an annual support fee of $1,800.

The initial license fee per package for Online Accounts Receivable, Accounts Payable and General Ledger is $3,320, plus an annual support charge of $330. The alternative monthly license fee for each package is $110, which includes support. The initial license fee for each of the prerequisite batch systems for the online packages is $7,207. The monthly license fee for each package is $239.

Further information can be obtained from Honeywell at 200 Smith St., Waltham, Mass. 02154.

Gillock Gets Seven Years

MEMPHIS, Tenn. — State Sen. Edgar H. Gillock was sentenced in U.S. District Court here last month to seven years in federal prison and fined $10,000 for his role in the extortion of $150,000 from Honeywell, Inc.

Gillock is free on bail, awaiting a higher court's decision to hear his appeal, the U.S. Attorney's Office confirmed.

The sentencing followed a November verdict of guilty for Gillock and two former Honeywell employees, A. Arthur Ayers and Allan Harvey Bibby [CW, Nov. 29]. The two will be sentenced later this month.

Gillock — a Democrat who is still in office — could have received up to 75 years in prison on the extortion charges and on charges that he evaded taxes on the funds he extorted.

According to the 30-page indictment in the case, third-party companies — some of which were owned by the Honeywell employees — billed Honeywell for bogus services. The funds were divided among the defendants and used to pay Gillock for his influence with state and county officials [CW, July 26].

Gillock was paid $4,000 by former Honeywell employees in bogus, third-party billings in 1975 and 1976 to buy his influence in a $2.5 million contract awarded to Honeywell for the Department of Employment Security's computer system, the jury found.

Gillock was also found to have influenced the then-mayor of Shelby County, Roy Nixon, in 1976 in the purchase of an upgrade to the Honeywell 66/40 mainframe for the Shelby County data center. Gillock received six monthly payments of $3,000 each.

The state senator had been the target of investigations, indictments and prosecutions for several years, but was never convicted. He had pleaded innocent to the nine counts of fraud and other counts of tax evasion in this case.

Anderson, here.

Hello Jim, this is Tom Roberts.

Oh, hello sir.

I've received your request for increased funding on the B.I.N.D.E.R. Project. What sort of delays are we talking about?

Well sir, we seem, ah, to be behind deadline . . .

I'm already aware of that, Jim.

Well, because the new system, ah, seems . . . to interface more . . . subtly with the . . . ah . . . existing software. We. . . .

How *much* more is this subtlety going to cost me this time, Jim?

Well it seems . . . ah . . . that our first . . . ah . . . calculations were. . . . ah . . . . . .

Way off base, Jim?

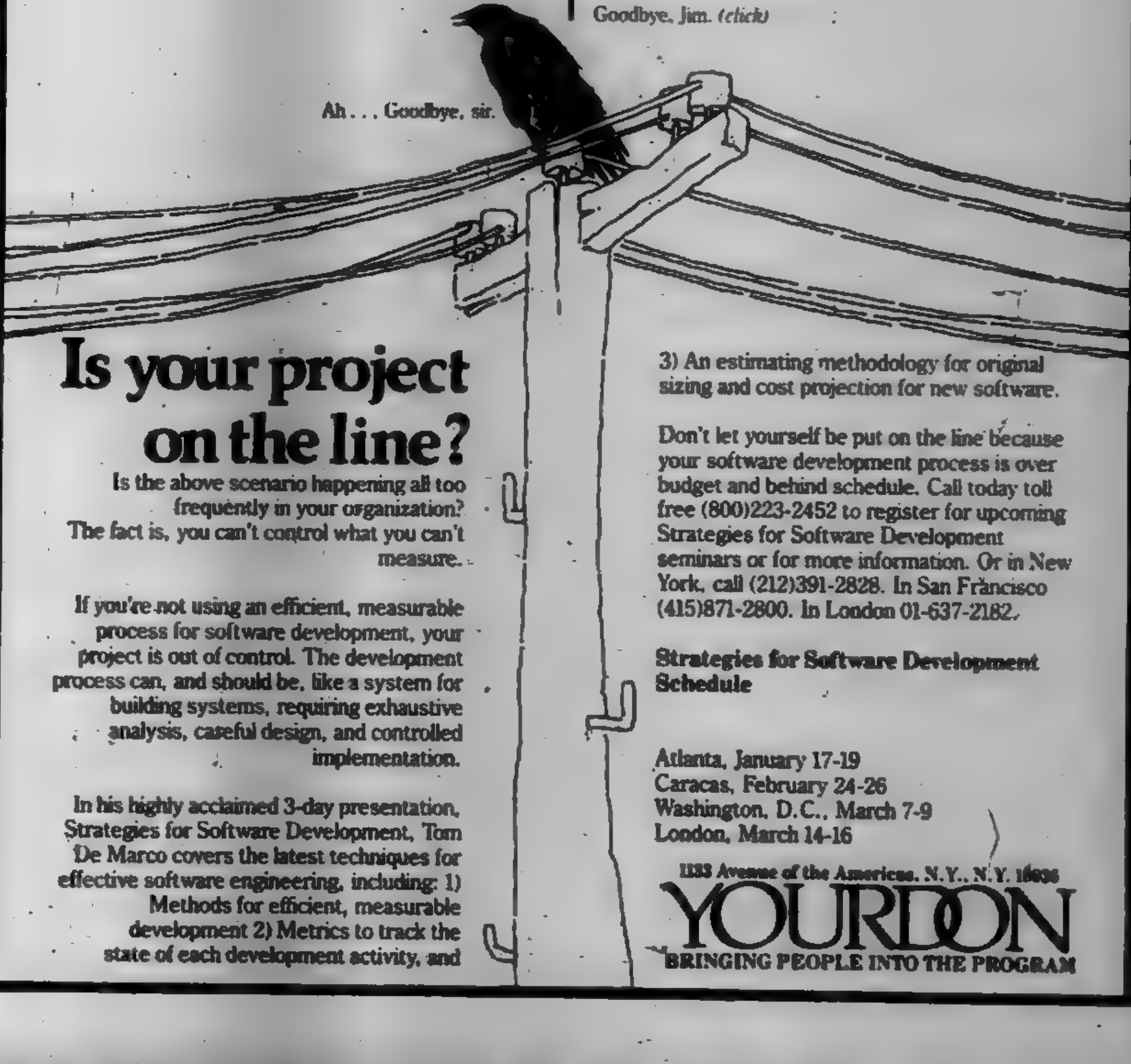
Ah. . . . well . . . a bit, sir.

I see.
Look Jim, this project is instrumental to the progress of our division. I'm going to be in town on Thursday and I'd like to talk with you about the B.I.N.D.E.R. Project and *your* future. Do we understand each other?

Yes, sir . . .

Goodbye, Jim. *(click)*

Ah . . . Goodbye, sir.



Is your project on the line?

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Comshare DSS For IBM Users

(Continued from Page 1)

of four dimensions and over 1,000 members per viewpoint.

System W reportedly also lets users produce reports with any of the dimensions of the model anywhere on the page, the vendor noted. Numbers can be printed in any format.

Text, numbers and other information can be mixed, and any dimensions of the model can be extended in a report to produce new groupings and can form rows or columns.

System W reportedly handles currency conversions and allocation of overheads automatically. Variables can be added or changed as necessary, the vendor said, and new dimensions can be added if required. System W will automatically restructure whatever is necessary to ensure the integrity of the model.

The software has a "what if?" sensitivity testing and goal-seeking capability that extends to all dimensions of the model, the vendor said, adding that all changes can be made on a temporary or permanent basis.

Micro W is intended for distributed decision support and addresses the need for a two-dimensional modeling capability in the hands of decision makers and their staffs, the vendor said. A model written on Micro W reportedly is totally compatible with the mainframe version of System W. Users can move a model to the mainframe from the micro and run it without modification when more processing power is needed.

Building a model on Micro W is done by proceeding through a series of menus displaying System W commands, similar to the way models are built on the mainframe version, the vendor added.

According to Kevin O.N. Kalkhoven, group vice-president of marketing for Comshare, Micro W minimizes rounding errors often encountered when mainframe software is transferred to micros. He said Micro W was designed not as a standalone micro package but as a distributed decision support system.

"I don't say it is as fast as [Visicorp's] Visicalc, but it is designed to do something different," he added.

With its Investigate command, Micro W goes into a "calc-like" mode, he continued, in which it is a spreadsheet with the capability of handling 7,000- to 10,000 cells. Kalkhoven stressed that Micro W can be run as a total modeling language rather than just as a spreadsheet.

Micro W includes an optional set of materials for computer-aided instruction of new users. Available for $1,500, this is comprised of 16 hours of training. The basic course is eight hours of training, available on a floppy disk to be run only on a personal computer. Day 2 of the training is an additional eight hours, which develops more complex topics such as viewpoints.

The core system is available for $55,000. System W Plus is priced at $75,000. System W Distributed costs $80,000, which includes two copies of Micro W. Additional copies of the latter are priced at $995 each.

Comshare is at Wolverine Tower, 3001 S. State St., Ann Arbor, Mich. 48104.

One of First 'System W' Users Looked for Ease of Use, Training

By Lois Paul
CW Staff

DENVER — When your user community has virtually no programming background nor any desire to gain computer expertise, the last thing you need is a complex decision support system (DSS).

That situation led Neil Williamson, a senior consultant with Fox & Co., a national accounting firm here, to pinpoint ease of use and training as the primary requirements for a DSS. Along with Fox's familiarity with Comshare, Inc.'s time-sharing network and products, it also led Fox to be one of the first domestic users of System W, the DSS formally announced today by Comshare (story on Page 1).

Fox began using the time-sharing version of System W last April; today, 30 to 40 users are up and running on the software. Although Fox is not yet employing Micro W, the company recently acquired an Apple Computer, Inc. Apple III microcomputer. As compatible micros are added, Fox will begin using the micro version of System W, Williamson said.

A move to the in-house version of System W, which runs on VM-based IBM and plug-compatible mainframes, is not anticipated at Fox. Most of Fox's inhouse hardware consists of minicomputers that will not support the stand-alone version of the product.

A number of DSS packages to which Fox has access via time-sharing — Tabol from General Electric Information Services Co.; Boeing Computer Services Co.'s Executive Information Services; Nomad II from National CSS, Inc.; and FCS-EPS from EPS, Inc. — were reviewed before Williamson's group chose System W.

System W was considered more appropriate partly because of its English-language orientation. "As intermediary users, we are just developing models to apply to situations of our clients. Generally, our client doesn't realize we are using a computer. The client only wants to see the bottom line," Williamson said.

In terms of training, System W has fared better than some other modeling languages his firm has used, Williamson added. Several people in his office spent a week training to use FCS-EPS, he said, but then shied away from using it. He attributed this to a general fear of computers and the complexity of the language.

System W has required a day and a half of training at Fox, according to Williamson. His firm was trained before the self-teaching tapes became available.

With little prompting, novice users begin to do simple applications and models with little support or supervision, Williamson said. "We wanted something that would be self-generating, that would become natural to use and would not be a pain and a challenge in and of itself. We are very impressed with that."

System W's use of viewpoints "allows incredible flexibility in defining relationships between groups of data and functions," he explained. For example, Fox used the software to create a model to handle cash flow projection for a client's real estate development project. The client corporation is broken down into five divisions, within which are several products. These are single-family homes, condominiums and townhouses, which are broken down further into types. In addition, there are cost features, and an overlaying consolidation of the hierarchy involves time features.

Working with these complex interrelationships, Williamson's group used viewpoint members to reduce the number of variables and simplify the rules. For example, it employed a viewpoint member for condominium and townhouses. Variables such as unit cost or unit sales value could be applied as needed to the same viewpoint. This allowed flexibility in inputting data and simplified the equations that were used.

When clients wanted to review the relationships used in the model, he said, it was surprisingly easy to extract that information using the power of viewpoints. "We did basically in three days a very, very large complex model that we couldn't have done in earlier times if we had to use other modeling languages," he said.

Harris Adds VAX Rivals to Its High End

(Continued from Page 1)

The H800-2B and H800-2BP are reportedly capable of supporting up to 128 concurrent users each and performing interactive program development, time-sharing, multistream batch, multiple remote job entry and real-time processing. The H800-2BP, Harris' highest performance virtual memory supermini, also has 6K bytes of bipolar cache memory, a spokesman said.

Like other Harris systems, the H800-2B and H800-2BP incorporate an integral hardware floating-point processor and a 48-bit architecture, with pipeline and parallel processing. However, they occupy just one-third the floor space of previous H800 machines, the spokesman claimed. Because of their construction, each system can be housed in a single compact cabinet, along with its accompanying disk drive and magnetic tape units.

The H800-2BP will be offered at a price similar to or lower than the VAX-11/780, but it provides approximately 30% more performance, according to Harris. The H800-2B reportedly offers performance equal to the 11/780 but costs about 15% less.

Both systems incorporate as standard equipment Harris' recently announced Communications Network Processor (CNP). The CNP, designed to relieve the CPU of performance degradation due to terminal load, supports communications via asynchronous, synchronous, isosynchronous and X.25 protocols [CW, Aug. 2]. It supports up to 16 communications lines, each of which can concurrently support a different protocol at different speeds and can be used for either remote or local connections, the vendor said.

The price of the H800-2B begins at $139,000. The 2B is field-upgradeable to a 2BP for an additional $35,000. H800-2BP prices start at $164,000.

The two systems are slated for shipment in March from Harris' Computer Systems Division, 2101 W. Cypress Creek Road, P.O. Box 6200, Fort Lauderdale, Fla. 33310.

Subsystem Available Separately

FORT LAUDERDALE, Fla. — The Integrated Memory Subsystem that Harris Corp. will announce later this week is included as part of the new H800-2B and H800-2BP processors, but can be purchased separately for use with other Harris computers.

The Integrated Memory Subsystem combines memory controller functions and memory arrays on a single board. The subsystem does this by incorporating an Integrated Disk Controller that combines the functions of an I/O channel and a disk controller on a single board. The Integrated Disk Controller supports up to four disks, according to the vendor.

The Integrated Memory Subsystem can be configured for up to 12M bytes of real memory. It has a typical access time of 250 nsec and a cycle time of 335 nsec for 48 bits of data, a Harris spokesman said.

Large-scale integration technology has been incorporated into the Integrated Memory Subsystem for error detection and correction. The board is said to be capable of detecting and correcting all single-bit errors and of detecting all two-bit and most three-or-more-bit errors. Error correction is possible on 48-bit memory accesses, the vendor said.

As a guard against random failure due to alpha particle radiation, the Integrated Memory Subsystem also performs rewrite operations on all correctable errors. The memory also has error-logging capability and the ability to force memory errors for testing purposes.

The memory's design reportedly saves one slot in the CPU chassis. It is currently available in several memory sizes, including a 384K-byte version, which costs $9,000; a 768K-byte model for $12,500; or 1.5M-byte model priced at $18,500. The memory is compatible with the full line of Harris superminis.

The subsystem is available from Harris' Computer Systems Division, 2101 W. Cypress Creek Road, P.O. Box 6200, Fort Lauderdale, Fla. 33310.

Honeywell Introduces Five Financial Packages

By Lois Paul
CW Staff

WALTHAM, Mass. — Five on-line financial planning and management software packages for its large-scale Level 66, Level 66/DPS and DPS 8 processors and its recently announced very large-scale DPS 88 systems running under Gcos and Gcos 8 were introduced here by Honeywell, Inc.

The five packages are the Honeywell Financial and Corporate Planning System (HFCS), the Honeywell Cashflow Management System (HCMS) and on-line versions of the firm's existing accounts receivable, accounts payable and general ledger batch systems, which are said to be fully compatible. The five packages can reside on the same computer system or be purchased and installed separately, Honeyell said.

HFCS allows the user to build a financial model of a company, including "what if" analyses that can test the effects of such variables as increased volumes, different tax rates, inflation and new investments. Optional modules include HFCS Hierarchical Consolidation, which reportedly consolidates data from multiple product lines or divisions in a simple aggregate manner or according to a company's hierarchical structure; and HFCS Risk Analysis, which helps the user evaluate the uncertainty of forecasts associated with a plan, using the Monte Carlo method, to arrive at the most valid probability distributions.

HCMS is a terminal-oriented application that provides a structured approach to planning and controlling a company's investment and borrowing programs up to 18 months in the future, according to Honeywell. Information is maintained on future cash requirements, payroll deduction data, cash projections and the estimated and actual amounts for major revenue and expenditure categories for up to 99 different funds. Each fund can be maintained individually or combined with any or all others in developing forecasts.

Online Accounts Receivable, Accounts Payable and General Ledger are said to provide additional flexibility and functionality for Honeywell's batch versions of these packages, which are prerequisites for their usage.

HFCS carries an initial license fee of $43,000, plus an annual support fee of $5,160. The Hierarchical Consolidation Option and Risk Analysis Option each have an initial license fee of $6,000, plus $720 each for annual support.

HCMS carries an initial license fee of $15,000, plus an annual support fee of $1,800.

The initial license fee per package for Online Accounts Receivable, Accounts Payable and General Ledger is $3,320, plus an annual support charge of $330. The alternative monthly license fee for each package is $110, which includes support. The initial license fee for each of the prerequisite batch systems for the online packages is $7,207. The monthly license fee for each package is $239.

Further information can be obtained from Honeywell at 200 Smith St., Waltham, Mass. 02154.

Gillock Gets Seven Years

MEMPHIS, Tenn. — State Sen. Edgar H. Gillock was sentenced in U.S. District Court here last month to seven years in federal prison and fined $10,000 for his role in the extortion of $150,000 from Honeywell, Inc.

Gillock is free on bail, awaiting a higher court's decision to hear his appeal, the U.S. Attorney's Office confirmed.

The sentencing followed a November verdict of guilty for Gillock and two former Honeywell employees, A. Arthur Ayers and Allan Harvey Bibby [CW, Nov. 29]. The two will be sentenced later this month.

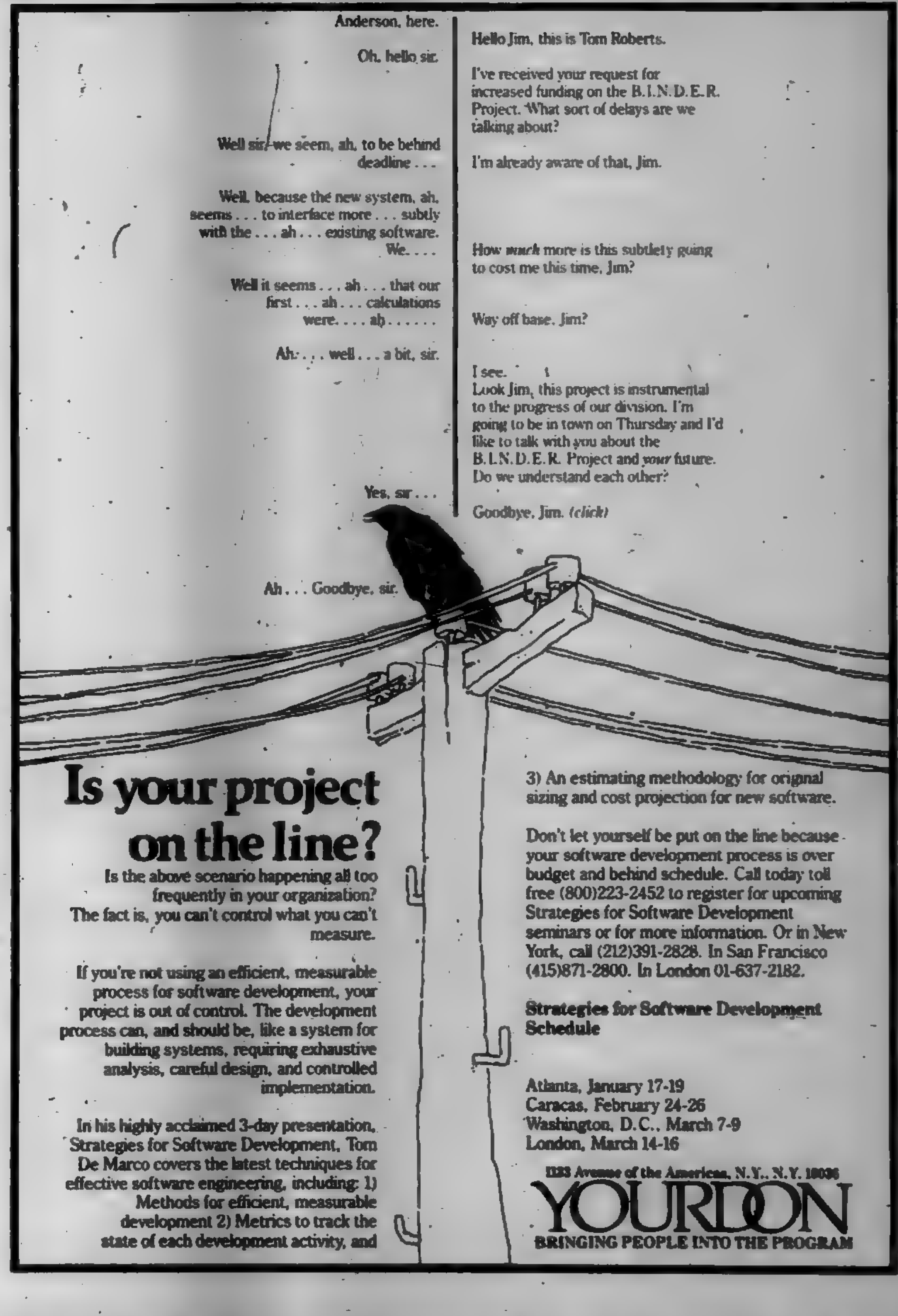
Gillock — a Democrat who is still in office — could have received up to 75 years in prison on the extortion charges and on charges that he evaded taxes on the funds he extorted.

According to the 30-page indictment in the case, third-party companies — some of which were owned by the Honeywell employees — billed Honeywell for bogus services. The funds were divided among the defendants and used to pay Gillock for his influence with state and county officials [CW, July 26].

Gillock was paid $4,000 by former Honeywell employees in bogus, third-party billings in 1975 and 1976 to buy his influence in a $2.5 million contract awarded to Honeywell for the Department of Employment Security's computer system, the jury found.

Gillock was also found to have influenced the then-mayor of Shelby County, Roy Nixon, in 1976 in the purchase of an upgrade to the Honeywell 66/40 mainframe for the Shelby County data center. Gillock received six monthly payments of $3,000 each.

The state senator had been the target of investigations, indictments and prosecutions for several years, but was never convicted. He had pleaded innocent to the nine counts of fraud and other counts of tax evasion in this case.



Anderson, here.

Hello Jim, this is Tom Roberts.

Oh, hello sir.

I've received your request for increased funding on the B.I.N.D.E.R. Project. What sort of delays are we talking about?

Well sir, we seem, ah, to be behind deadline . . .

I'm already aware of that, Jim.

Well, because the new system, ah, seems . . . to interface more . . . subtly with the . . . ah . . . existing software. We. . . .

How *much* more is this subtlety going to cost me this time, Jim?

Well it seems . . . ah . . . that our first . . . ah . . . calculations were. . . . ah . . . . . .

Way off base, Jim?

Ah . . . well . . . a bit, sir.

I see.
Look Jim, this project is instrumental to the progress of our division. I'm going to be in town on Thursday and I'd like to talk with you about the B.I.N.D.E.R. Project and *your* future. Do we understand each other?

Yes, sir . . .

Goodbye, Jim. *(click)*

Ah . . . Goodbye, sir.

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User Friendliness, Compatibility at Top

CICS Users List Application Development Goals

By Paul Gillin
CW Staff

NEW YORK — User friendliness and compatibility with existing programming languages are among the top features IBM CICS users are looking for in an application development system, according to an informal survey of users at a recent conference here.

Users also expressed concern that an application development system should include interfaces to existing data base management systems (DBMS), file transfer facilities and various monitors and should minimize the drain on memory resources. Questions also focused on price and ease of user training.

About 150 CICS users attended a session on CICS/VS application development systems held here by the Teltech Systems, Inc.-sponsored CICS Users Group. The session featured pitches from technical and marketing representatives for Multiplications, Inc.'s Accolade, IBM's DMS, Cincom Systems, Inc.'s Mantis, Pansophic Systems, Inc.'s MIS/OL and Oxford Software Corp.'s UFO.

Users at the conference also indicated that growing applications backlogs and a critical shortage of CICS programmers are forcing DP shop managers to turn increasingly to application development systems to hike productivity. And the need for this help has become more pronounced in the past year.

"We're a small staff without many people trained in CICS," said Arthur Cecchini, senior programmer/analyst at the Liggett Group, Inc. in Montvale, N.J. "Our users would like on-line applications but they're concerned about costs. We want to give them CICS accessibility without added cost."

Timely Fashion

And they want it quickly. "To me as a manager, my concern is getting the system up in a timely fashion," said Jay Eizik, a systems analyst at Guardian Life Insurance Co. in New York. Eizik said his shopping list included user-friendly features like Help screens and prompts, screen-building capabilities and low memory overhead. He was particularly interested in Accolade and MIS/OL.

Other users stressed that an application development system should be fully compatible with command-level code and popular programming languages. "We're very interested in programs whose resultant code is command-level Cobol," said Ken Martin, a consultant to National Benefit Life in New York. "That way we can modify the package on our own and use it for major development."

Calling predictions that application development systems will be in almost universal use by 1985 "overblown," Stanley Gordon of LTI Consulting Services in New York said the systems will be limited until the command structure on most application development systems is generalized to allow easier updating. Until then, he said, the packages will be limited to small application development.

However, one user said he intends to use an application development system for large-scale, on-line applications. "We are understaffed and it's difficult to find quality CICS programmers," said Frank Delmore, manager of technical support for National Benefit Life. "We hope this will make it easier to get production out of CICS." He said the company is actively looking at Accolade.

For the most part, users said their programming staffs actively supported buying an application development system. "Our programmers want more CICS involvement. If this is what it takes, this is how they'll do it," said Cecchini of the Liggett Group.

"Some of our programmers were concerned about being removed from CICS," said Eizik of Guardian Life. "But to me, speeding up development is more important than giving programmers more time to learn CICS."

Do You Use a Micro To Run Your Business?

Is a microcomputer helping you run your business?

Computerworld is preparing a Special Report on "Micros in Big Business" for its March 28 issue. If your business incorporates microcomputers in a way that significantly impacts overall data processing operations, CW would like to hear from you.

We are particularly interested in microcomputers that are directly attached to a large host processor, microcomputers linked through a communications network to a host processor and microcomputers linked together. We are also interested in ways that microcomputers are replacing larger processors or off-loading some of a mainframe's work load.

If your shop is doing any of these things, we would like to hear about it. Write a description of the application and send it by Feb. 1 to Tom Henkel, Writer/Analyst, *Computerworld*, 375 Cochituate Road, Box 880, Framingham, Mass. 01701. Articles must be typewritten, double spaced and no more than five or six pages in length. Accompanying graphs, charts and pictures are welcome.

Articles about stand-alone applications or those involving nonbusiness applications, such as computer games, will not be considered.

CICS Users Assail 'DMS'

(Continued from Page 1)

cation development system. A recent survey found that 24% of one-time DMS users who responded have already converted to another product and another 40% of the respondents intended to convert [CW, Oct. 11].

With that apparently in mind, the tone of the IBM representatives at the session was noticeably conciliatory. "Enhancements are on the way to make it more friendly and usable," Wilkins said during his presentation. "I think it's usable right now. I think it could be more friendly."

John Brizendine, an IBM product administrator, said the company is now pouring resources into DMS in an effort to allay the fears of many current users. "IBM is giving a better guarantee that applications will be portable from release to release," he said. "We are using rigid specifications in order to deliver quality beyond what you would expect from most IBM software products."

However, the users interviewed indicated IBM had some convincing to do. "We are disappointed, and I'm here looking around to see what else is out there," said Rod Dorman, applications program manager with Citibank in New York.

Dorman criticized DMS for its difficulty in handling vertical-length files and for awkward coding. But he said he was buoyed by IBM's apparent interest in rectifying some problems. "It's bad enough we're a two-language shop without being a two-application-generator shop," he said.

Gordon, whose question sparked the impromptu gripe session, said he has never recommended that users look to DMS for application development. "From what I've been reading and hearing, I'm not going to recommend it in the near future, either" he said.

Ruling to Alter Dial-Up Fees

(Continued from Page 1)

crease will balance the increase. The interstate carriers are now paying local telephone companies about $8 billion for the Non-Traffic-Sensitive portion of local-exchange costs. Next year, the local telephone companies will collect about $4.3 billion of this amount directly from their customers.

Another unresolved question involves the size of the subsidy needed to make telephone service available in high-cost areas. A joint board composed of industry and FCC officials has been studying this matter and is scheduled to make a recommendation in March.

The carriers' contribution to local access costs also may create controversy. Under the plan, AT&T's Long Lines Division must pay $1.4 billion more than competing other common carriers for local access next year because the phone company gets better quality service. Long Lines is almost certain to want this charge reduced; its competitors, the other common carriers, would like it increased.

Reagan Proclaims '83 Communications Year

WASHINGTON, D.C. — In concert with a United Nations initiative, President Reagan has proclaimed 1983 "World Communications Year," a move he said is aimed at stimulating "economic and social progress around the world through accelerated expansion of communications and information services."

In a White House signing ceremony, Reagan called the U.S. telecommunications firms "path breakers in the most communications-intensive era in history" and remarked that the U.S. is "one of the few nations of the world in which telecommunications is still controlled by private enterprise."

He also noted, "The development of new technologies — such as computers, microchips, satellites, fiber optics — has revolutionized our concept of communications."

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'Info/Management' Malcontents Called Few

By Jeffry Beeler
CW West Coast Bureau

VIENNA, Va. — Most customers of IBM's Information/Management system are reasonably happy with the way the problem-reporting and configuration control product is supported, even though a few outspoken users are voicing dissatisfaction.

That observation comes from James Kaye, chairman of the Information System Product Committee within the industry giant's Share users group. Kaye, a systems programmer at Boeing Computer Services, Inc. here, took exception to a recent *Computerworld* article in which several of the vendor's largest West Coast users were quoted as saying they had asked IBM repeatedly to enhance the system with mass-updating and archiving/batch interface facilities, but that the requests had fallen on deaf ears [CW, Nov. 15].

In a recent telephone interview, Kaye said that although a minority of the product's users would probably disagree, for the most part IBM has been "extremely responsive" in meeting the changing needs of its Information/Management customer base.

Although Kaye conceded that some users desperately need mass updating and archiving facilities and acknowledged that IBM has assigned the proposed enhancements a low priority, he characterized those users as a small share of the vendor's overall customer base.

Matching Priorities

"The majority of the people who are willing to show up and participate at Share meetings feel that IBM's priorities [for future enhancements to Info/Management] exactly match their own," Kaye said. "The reason archiving and mass updating appear at the bottom of IBM's priorities list is that the majority of the users who have voted on the question [of future enhancements] put them down there."

First released about two years ago, Info/Management forms part of IBM's Information System offering, which runs under MVS and allows users to do first-level problem determination on-line. In essence, Info/Management provides companies with a data base that permits systems personnel to keep track of all unscheduled hardware, software and network outages that last longer than a specified period.

The product also records configuration changes and all interruptions of end-user computing services. The contents of Info/Management's data base can then be used by DP personnel to produce systems-availability reports for senior corporate executives.

DPMA Changes Cobol 80 Stance

(Continued from Page 1)

ward compatibility that has been at the heart of much of the opposition to Cobol 80.

Art Dubnow, chairman of DPMA's standards committee, told *Computerworld* last week that "DPMA does feel that the changes they have made now are substantial enough that the standard now can go out for public review and be questioned. DPMA is looking forward to a new dpANS X3.23-198x Cobol going out for public review again."

He stressed that there is still a "dichotomy" between what DPMA feels the standard should include and its present status. "We, the DP managers, in principle, want upward compatibility. On the other hand, we want advanced features," he said, adding, "We will never get 100% upward compatibility, but now it is ready for debate. If the benefits outweigh the disadvantages, our users will probably buy it."

"We have a number of alternatives, which they haven't really yet addressed, but I think they will. The important thing is that they heard us," he said.

Dubnow cited the strong industry response to the proposed standard as being key to the changes that already are being made. "We sent out the warning message and industry got involved and they are paying attention."

Response Deadline

He noted that any responses to the comments by X3J4 must be filed by Jan. 21.

Responses to the X3J4 comments should be sent to the X3 Secretariat, Computer and Business Equipment Manufacturers Association, Suite 500, 311 First St. N.W., Washington, D.C. 20001.

It is important for respondents to include the number assigned to them in the cover sheet of the package they received from X3J4, Dubnow said.

The next step is for X3J4 to review responses received by Jan. 21, make any further changes it feels are appropriate and then report to the X3 committee. The X3 committee will meet during its regular four-month intervals (February, June and October) and decide whether or not to send the standard out for public review. At this time, DPMA intends to conduct a thorough analysis and review of the changes to the proposed standard.

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From Operators to Executives

DP Turnover Blamed on Lack of Career Paths

By Bruce Hoard
CW Staff

NEW YORK — From computer operators up to top executives, the most common cause of turnover in the DP industry appears to be the lack of career paths, according to various experts interviewed last week.

"Ten years ago, people got to know everything from I/O control on up and got to deal with their own job control language utility problems," observed Art Lawrence, president of Comtek, Inc., a New York recruitment firm specializing in operations personnel. "Now, some companies have people handling only one portion of the input and never touching output." Such rigid departmentalization inhibits career growth, he maintained.

Lawrence said that when operations employees become disenchanted with their salaries, they tend not to tell their supervisors, searching out new positions instead. Employers are fighting operations turnover by providing two small raises a year instead of one large one and making counteroffers when employees announce their intentions to leave. However, the counteroffers are successful only about 50% of the time, Lawrence said.

He fixed the turnover rate for operations workers at about 20%, noting that New York has the highest operations turnover in the country because so many DP centers are concentrated in so small an area. "I know guys who have only had four jobs in their whole life and they have all been in the same building," Lawrence said.

Bob Stanton, president of Management Scientists, Inc., another New York recruitment firm that specializes in finding jobs for programmers and systems analysts, said his clients fix the turnover rate for programmers and systems analysts at between 10% and 20%. The primary causes of turnover among the two groups, he explained, are dissatisfaction with the working environment, dissatisfaction with salary and the failure of management to carry through on promises and maintain state-of-the-art DP shops.

DPers need to be working on sophisticated development projects, Stanton claimed; when they are not, or when they are doing only maintenance work, they may start looking for a new employer.

The state of the economy is one variable that affects turnover. In fact, the current recession has lowered the turnover rate during the past six months. Nonetheless, there is more turnover among programmers than systems analysts because "programmers are more in demand than straight systems analysts," Stanton claimed.

A number of companies are fighting programmer turnover by offering more staff meetings and technical education. They are also promoting from within, Stanton said.

On the other end of the job spectrum are the DP managers and top DP executives. They are a different breed than operations personnel, programmers and systems analysts, according to Bonnie Kaplan, DP placement manager with Robert Half Associates here.

She was reluctant to cite a turnover rate among DP managers and top DP executives, but called discontent with, and lack of support from, management the primary cause of turnover. "Corporate management sees DP as a cost center, not a profit center," Kaplan explained.

Fluctuations in the economy have a minimal effect on top-level DPer turnover, although executives may be willing to take more job-hopping risks in a healthy economic environment. DP executives are also always ready to consider job offers whether they are looking or not, Kaplan added.

His Turnover Rate: Less Than 5%

RICHMOND, Va. — At a time when many state-run DP shops are losing workers to the private sector, Bill Bell and the commonwealth of Virginia are turning the tables.

Bell is deputy director for systems development at the commonwealth of Virginia's Department of Management Analysis and Systems Development. His 112-person department is hiring DPers away from the private sector while at the same time maintaining an annual turnover rate of less than 5% over the last three years. He does it by providing well-defined career paths and counseling.

"We feel like the diversity of opportunities available for people here, allowing them to get broad exposure to the entire technical field, is one of the strong points that holds our turnover down to reasonable limits," Bell said.

Those opportunities include technical work in such hardware environments as IBM, Sperry Univac and Hewlett-Packard Co. In addition, the department also offers data base environments within each of those hardware environments, he said.

Involving DPers

Involving DPers in the decision process has also held down turnover. Bell referred to "team autonomy" and "program management teams" that espouse a philosophy similar to that embodied in the well-known "quality circle" approach to management.

He broke down his department into program managers, senior project managers, senior analysts, programmer analysts and programmers. Turnover tends to strike hardest at the senior analyst and programmer analyst level, he said.

"I find the primary cause of turnover in our organization is diminished challenge," Bell said. Defections have a tendency to come after DPers have finished work on sophisticated development projects and find themselves in a lull and doing maintenance and modification work, he added.

Bell noted that some state agencies cite the inability to pay salaries competitive with those in the private sector as a reason for losing employees. He said that is "no excuse."

Corrections

In "Relational DBMS Offered by Contel" [CW, Oct. 11], Contel Information Systems' product RTfile was mistakenly called "Rifle." RTfile is a version of Contel's interactive relational data base management system designed to run under Digital Equipment Corp.'s RT-11 and other operating systems.

Prices for Cobgen, a parameter-driven Cobol source code generator for IBM OS and DOS systems [CW, Dec. 13], start at $8,000. The price was incorrectly quoted as $8,000.

In "Enthusiasm, Four-Year DP Degree Win Job Offers in Data Processing," [CW, Dec. 20], the quotation regarding computer aptitude testing came from Joseph O'Dea, assistant vice-president at the European American Bank in Westbury, N.Y.

The correct title of the workshop that will be held March 4-6 in Harvard, Mass., and May 20-22 in Temple, N.H., by consultant Arthur Fink [CW, Dec. 20] is "Computers and Personal Values: Sharing From Experience." The lead speaker will be Joseph Weizenbaum, author of *Computer Power and Human Reason.*

March 4 Deadline For Auditors' Exam

CAROL STREAM, Ill. — The deadline for registering for the EDP Auditors Foundation, Inc.'s annual Certified Information Systems Auditor (Cisa) examination is March 4. The exam will be given April 9 at more than 50 U.S. and foreign sites.

The Cisa program was designed to identify people professionally competent in the integrated areas of auditing and DP. The exam was jointly developed by experts in the field and the Educational Testing Service.

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Weather Service to Caterpillars: 'Told You So'

By Paul Gillin
CW Staff

CAMP SPRINGS, Md. — To those who figure sunspots, volcanoes and woolly caterpillars into their long-range weather forecasts, the winter prediction issued by the National Weather Service last November came as somewhat of a surprise. It predicted a season that would be milder than normal for much of the eastern U.S., contradicting frigid forecasts by many local meteorologists and venerable sources such as the *Farmer's Almanac.*

Now, with nearly six weeks of unseasonably mild weather in the eastern region behind them, the staff at the National Weather Service's Climate Analysis Center, which develops monthly and seasonal forecasts, is entitled to an "I told you so."

Although the center's Robert Dickson will not claim the staff's methods are any more scientific than others, he acknowledged that the accuracy of its forecast was a pretty good bet.

"We were fairly confident we had a good handle on this forecast all along," Dickson said. "In fact, all of our forecasters were in agreement about the general nature of this winter."

Complex Process

Such apparent prescience is really the result of a complex process which has increasingly relied on computers in recent years. Each day at thousands of sites around the world, information is gathered about climactic conditions of temperature, air pressure and wind direction at sea level, 10,000 feet and 40,000 feet above sea level.

Data from 400-plus field stations is sent to Suitland, Md., where it is fed first into a bank of IBM 360/40 and 4341 computers run by the National Weather Service and then into three IBM 360/195s belonging to the National Oceanic and Atmospheric Administration, the agency that oversees the Weather Service.

At Suitland, the 360/40s busily churn out daily maps displaying temperatures and conditions across the northern hemisphere. While forecasters there monitor the battles, the Climate Analysis Center observes the war.

Disregarding such passing anomalies as storms and low-pressure troughs, the center's staff of 50 concentrates on the more general patterns exhibited in the upper atmosphere.

"Our forecasts are based on analyses near the 10,000-foot level," Dickson explained. "That's about midway in the troposphere, where flow patterns begin to exhibit wave-like behavior. That is more useful in generating long-range forecasts."

Programs smooth out the day-by-day reports used by the Weather Service to prepare a series of maps and figures every 15 days, Dickson said. This output is key to preparing the monthly and seasonal forecasts the Climate Analysis Center issues at the end of each month.

The programs, written in Fortran IV by mathematician and analyst/programmer Dave Durdall, prepare charts of "observed conditions," or summaries of the previous month's climactic trends. The data comes in a compressed format from the 360/195s via the Weather Service and is printed in map form on Varian Data Systems, Inc. plotters in the Climate Analysis Center.

"The programs create a simple regression equation at each of 541 points around the hemisphere using data dating back to 1947," Durdall said. For a monthly forecast for January, for example, the computer sorts 35 years' worth of data and constructs a mean data field for December. The system then plugs in the most recent December data and, accessing the base again, turns out a map showing statistically what January should look like.

But lest it seem that the computer is doing all the work, Dickson pointed out that this stage is merely a handoff to a team of four Climate Analysis Center forecasters. "It's still very strongly a man-computer mix for now," he said.

The computer-generated maps are just a guideline, Durdall said, and not every variation in the data field is significant. So the 20 to 25 different charts which roll off the plotter include correlation fields that meteorologists use to determine what will affect the weather in the long term and what is just a passing phase. "The forecasters look at the correlation fields and, using statistical analyses, decide which anomalies they are going to trust," Durdall said.

What the forecasters saw late last November left little room for doubt, Dickson said. "The fall season gave a strong suggestion of a strong upper level pressure ridge along the Western Atlantic persisting into the winter season," he said. "Statistical relations suggest that this is one of the most reliable features there is" in predicting a mild winter.

Dickson cautioned that even with the benefits of modern technology, "It's an incomplete forecast without our indications of the probability of success," which usually run from 50% to 75%. "The nature of the beast is that we're able to predict temperatures on the right side of normal about 65% of the time," he conceded. "But it beats the flip of a coin."

Do you have some questions about VSAM file handling in COBOL?
Then here's the book for you...

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VSAM for the COBOL Programmer

If you have to work with VSAM files and you're unsure of what you need to know about them, then you should get a copy of *VSAM for the COBOL Programmer*. Just as its title implies, this practical, how-to guide will teach you all the basics of handling VSAM files in COBOL.

The first chapter is an introduction to VSAM. It talks about VSAM's advantages ...and drawbacks...and introduces you to the common terms you'll need to know before you can continue.

Chapters 2 and 3 are the meat of the book because they cover VSAM key-sequenced files. Key-sequenced files are equivalent to ISAM files on a non-VSAM system, and they make up about 95% of all VSAM files.

Chapter 2, then, explains the COBOL elements you need to know for key-sequenced files. And it gives in-depth coverage to handling the errors that can occur when an I/O statement is executed for a VSAM file. In addition, it tells you how to code the OS JCL you need for COBOL programs that use VSAM files... and why the JCL is so much simpler than it is for ISAM files.

Chapter 3 covers IDCAMS, the Access-Methods-Services program. This is the utility program you must use to set up disk space for a VSAM file before you can even create the file in a COBOL program. In addition to learning how to set up file space, you'll learn how to use IDCAMS to: copy, print, and rename VSAM files, load a VSAM file from a non-VSAM file; and list and maintain a VSAM catalog.

Once you've mastered the material in chapters 2 and 3, you can quickly go through chapters 4 and 5. They cover the COBOL, JCL, and IDCAMS considerations for entry-sequenced and relative-record VSAM files. These are equivalent to sequential and relative files on non-VSAM systems.

Throughout chapters 2-5, the learning is geared toward the OS user. In fact, chapter 5 is for the OS user alone, since DOS VSAM doesn't support relative-record files.

But chapter 6 is devoted to the DOS user. It presents all the variations you need to know about if you're working on a DOS system. So here, you'll learn how the COBOL code, the JCL, and the IDCAMS statements differ from OS. And I think you'll be surprised at how few differences there are.

In short, then, by the end of the book you'll have a thorough grasp of what you need to know to write COBOL programs for VSAM files.

2 reasons why this book is effective

1. The author of this book, Doug Lowe, selected the content based on an analysis of what a COBOL programmer needs to know about VSAM. That means this book contains everything of use to the average COBOL programmer and very little that isn't. It also means you can learn significant VSAM skills...and find the answers to your VSAM questions...in a minimum of time.

2. Perhaps the most important feature of this book is that it contains plenty of examples, so you always see just what the author is talking about. Examples like:

- COBOL listings for file-creation, update, and print programs
- summaries of the codes that can occur in the FILE STATUS field after an I/O statement has been executed...along with recommendations on what action to take when an I/O error occurs
- DOS and OS JCL for running VSAM COBOL programs
- IDCAMS statements for creating, printing, copying, and renaming VSAM files
- JCL for using the ISAM interface program supplied by IBM

There are over 50 illustrations in all, designed to help you learn about VSAM...and to serve as models when you're coding VSAM jobs on your own.

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Dear Mike: Please send me the books indicated below. They must teach me the COBOL subjects I want to learn, or I'll return them at any time for a full refund.

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Equitable Life Program Gets Top Management To Listen to DPers' Concerns

By Marguerite Zientara
CW Staff

NEW YORK — Effective communications between DP and upper management at Equitable Life Assurance Society of the United States has resulted in "a tremendously increased awareness at the senior level of issues regarding computing in the 1980s." That is the conclusion of James Johnson, vice-president and innovation officer for the firm, who has taken on the job of keeping top management abreast of changing technologies.

How did the company achieve the elusive "effective communications"?

The first step was taken last April, when Johnson was asked to give a presentation to Equitable's 12 top officers, including the chief executive officer. He was expected to explain innovations in computer technology and demonstrate the need for the DP department's expansion.

"I had given a number of presentations before, but it was the first time I had given one to the senior executives," Johnson noted. "I had hundreds of ideas and it was a real problem sifting them down to what was really significant to senior executives.

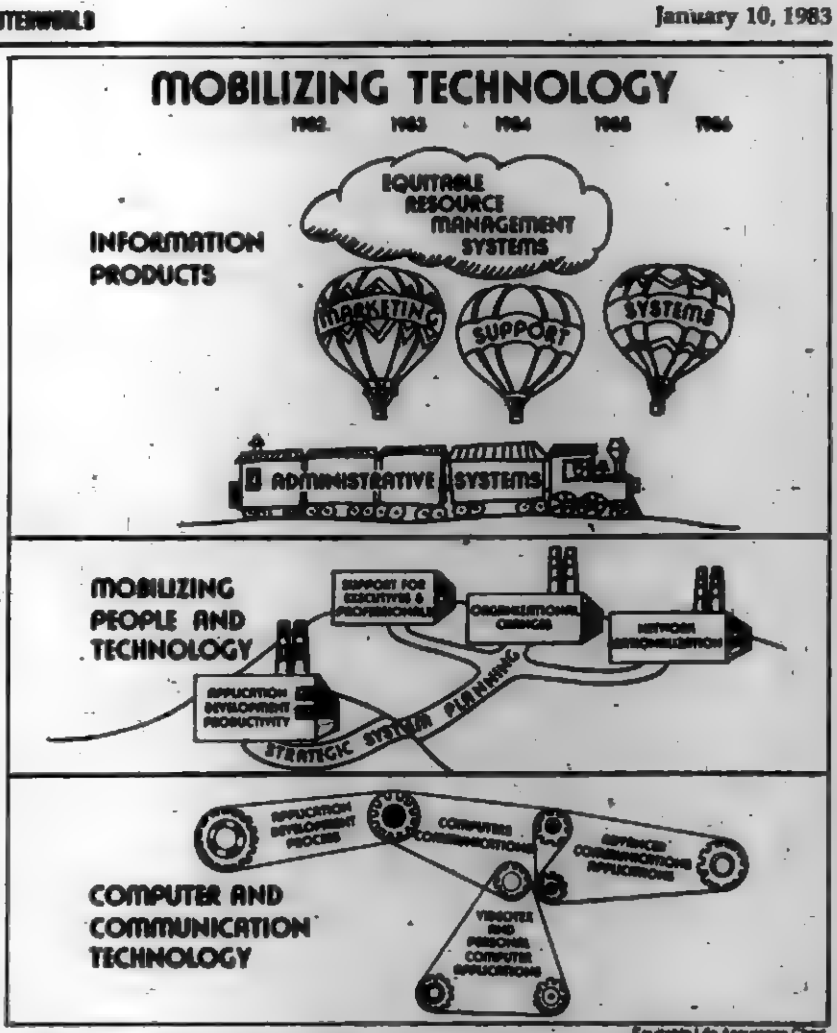
"Technical people like myself tend to be process-oriented and executives are results-oriented," he observed. "So it's hard to get that shift into the results-oriented mode that makes it interesting to them."

Johnson looked to an executive training firm here that he had worked with a number of times, Peter Rogen & Associates, Inc. Trainer Bob Thomas "has done quite a bit of consulting to senior management, including the senior management of Equitable," Johnson explained, "so he was able to look at things from the management perspective and see if I was making sense from their point of view."

Most of the top officers "were familiar with how computers had been used to merchandise administrative systems," Johnson said. "Now I was asking them to endorse and 'sponsor' market support systems and Equitable decision support systems — programs they knew very little about."

Working together, Thomas and Johnson analyzed the Equitable decision makers' needs, defined the objective of the presentation and developed visual support materials that would convey the message effectively (see illustration).

"The technique is to mock up the entire presentation in one flip chart, organized in such a way that it really forces you to cut it down to the crucial ideas," Johnson explained.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COMPUTERS COMMUNICATIONS
ADVANCED COMMUNICATIONS APPLICATIONS
COMPUTER AND COMMUNICATION TECHNOLOGY
VIDEOTEX AND PERSONAL COMPUTER APPLICATIONS

Equitable Life Assurance Chart

Thomas and Johnson, after defining the objectives of presentations made by Equitable's decision makers, developed visual materials like this.

"It's a mechanical technique in some respects," he added. "It's almost like drawing an empty flowchart in a prearranged format. In other words, the presentation starts out with a format and you have to fit the thing into it.

"The discipline of doing that forces you to examine what's really important. It tends to create a presentation that has an objective and a conclusion and a few main points that are appropriately amplified," he noted.

"The process of making the charts helped me get a very clear image of what it takes to mobilize technology," he noted.

"For example, the three main themes are the information products, the computer and communication technologies that support those products and the effort to mobilize the people and technology so we can change direction.

"Those things are not only important, but are things that executives can grab onto," he noted.

One tactic Johnson used in getting his ideas across to top management began two months before his actual presentation. "I had a chart that was about 5 feet by 7 feet with all the technologies and products that we expected to see over the next five years and I just left it in the board room," Johnson recalled.

"People were able to make their own interpretations of all the things that were going on and it really was quite a talking point around the company for quite a while," he noted. "So that, even without the presentation, people were able to visualize what was going on."

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Three WP Typists at Ford Named in Betting Operation

By Jim Bartimo
CW Staff

DEARBORN, Mich. — A $5,000-a-week gambling operation at Ford Motor Co. that allegedly involved 300 employees and the company's word processing equipment ended last month with the arrest of three clerk typists in the Engineering Department. The word processing equipment was reportedly part of a $25,000-a-week gambling operation involving about 500 employees that may have also entailed use of Ford's data processing operation.

The three employees arrested last week — Cheryl Bennett, David Jacek and Donald McNutt — were charged with conspiracy to violate state gambling laws and will be arraigned later this month. All three have been fired by Ford.

Ford's own security force alerted the police about the gambling pool, reportedly active since mid-1980. Bennett operated the word processor "to align, format and organize a football pool," Sgt. Ron Mattioli of the state police Criminal Investigation Section said. An investigation has been launched to determine the extent of computer use in these activities, Mattioli added.

"They were into horses, bowl games and a lot of other things," Mattioli said. "I've heard rumors of $25,000 per week. There was one guy who was making $1,000 per week."

A Ford spokesman refused to comment on any aspect of the arrests.

While many offices have football pools, the state plans to prosecute the three involved in this one because of its size. "They were printing the [betting] tickets and we prosecute that," according to Dick Tadzieski, chief of the Criminal Division in the Wayne County prosecutor's office.

"Just as a matter of background," Tadzieski said, "we broke a gambling ring where we knew that the printouts were coming from the GM [General Motors Corp.] text center, but we couldn't prove it. So I guess computers play a role in figuring out the odds for these things."

As word and data processing proliferate, office automation experts have both feared and predicted that the office equipment would be used for purposes other than those for which the equipment was designed. "As we distribute these smaller systems, it will be recognized as a perk — like a [copy] machine," according to Lynn McNulty, director of information systems security for the U.S. Department of State.

"The more you distribute this equipment, the more people see a relationship between their work and their personal business," McNulty said. "I've seen places where people were using the system to do their own commodities forecasting — anything you can think of — little league scores, bowling leagues."

The irony is that businesses often perceive the misuse of equipment as a need for more hardware, McNulty said, and they purchase additional CPU power for the personal business of their employees.

Former Employee Charged With Tapping Fed's Data Bank

WASHINGTON, D.C. — The Justice Department last week filed wire fraud charges against a former Federal Reserve employee for allegedly accessing a Federal Reserve data bank after leaving the government to work for a large New York brokerage firm.

The former Federal Reserve economist, Theode C. Langevin, said he will plead guilty to the charges, according to a Jan. 6 report in *The New York Times*.

In a filing with the federal court here, prosecutors charged Langevin with using the name and password of another agency employee to gain access by telephone to "sensitive and confidential information relating to . . . the money supply as projected by the [Federal Reserve]." This allegedly occurred sometime in late November, shortly after Langevin went to work for E.F. Hutton & Co. in New York, the government said.

Federal Reserve officials reportedly noticed the improper access of the computer and waited for a second attempt, which led them to Langevin. The money supply projections are the basis for Federal Reserve interest rate actions.

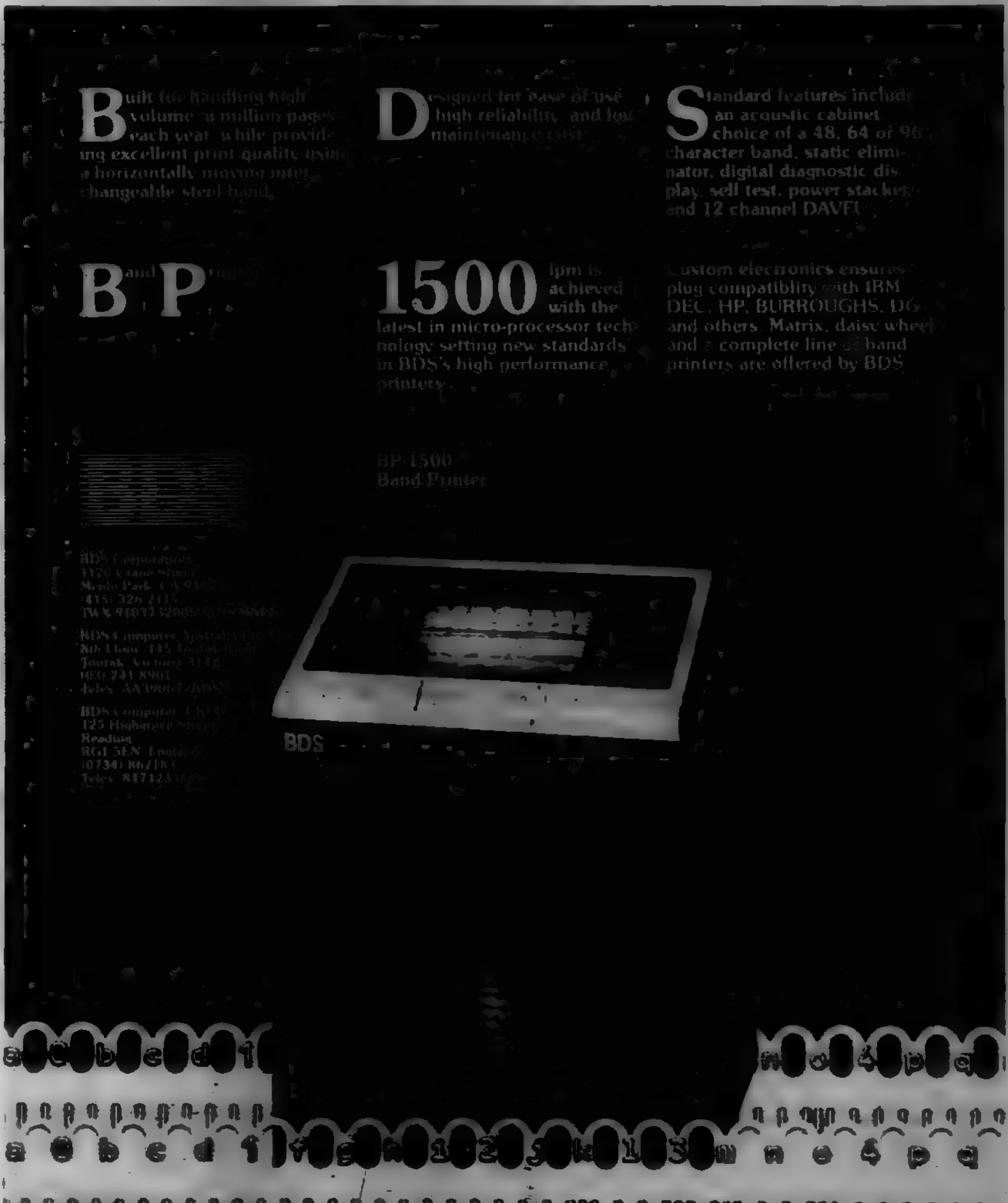
The one count of wire fraud carries a maximum sentence of five years in jail and a $1,000 fine.

ABA Directory Lists Law Office Programs

CHICAGO — A directory of programs and computer applications has recently been compiled here by the American Bar Association's (ABA) Economics of Law Practice Section.

Called "Locate: A Directory for Purchasers of Law-Office Computer Applications and Software," the annually updated text reportedly profiles over 100 vendors and their product offerings. It concentrates on such software products as timekeeping packages and litigation support.

This reference guide costs $28 from the publisher at 1155 E. 60th St., Chicago, Ill. 60637.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Lawyers: Seek Legal Aid During Contract Talks

By Jim Bartimo
CW Staff

A Midwestern publishing company bought a computer in September 1978 without the aid of a lawyer. Two years later, the company was so unhappy with the computer's performance that it filed suit against the vendor.

Early this year, Quality Books, Inc. will face off against Burroughs Corp. in one of the most watched court battles in the computer industry.

Would a lawyer's services have saved Quality Books from a lengthy legal battle? Is it always necessary for the DP department to bring in a lawyer when making a purchase?

Legal Advice

Lawyers contacted by *Computerworld* offered their advice to DP managers about when and how to use a lawyer in the purchase of computer hardware and software.

"Had Quality Books had a contract early on, we would have known very soon that something was fishy," according to Quality Books' present representative, Marvin Benn of the Chicago law firm of Hamman, Benn and Miller.

Benn believes a lawyer should be brought in if the hardware purchase totals more than $30,000 or if the software purchase is over $10,000. "Depending on the amount of money involved, they [users] should draw up a request for proposals [RFP]," he said. "I don't help them make the choice, I put certain things into the RFP" and allow the users to look it over.

"The basic advice is to get a lawyer involved as soon as possible," an attorney for a large software company added. Because this particular lawyer is usually on the other side of the negotiating table from the DP manager, he asked not to be mentioned by name, but offered his advice.

A lawyer can make sure the software company does everything it promises and deal with regulatory agencies. The issues can often be extensive legal ones, the lawyer said. "You need a lawyer when you're buying a customized piece of software or when buying an off-the-shelf piece of software." The major difference is that there is more room for negotiation when buying customized software.

"With respect to off-the-shelf software, it's a little less important to have a lawyer, but it's important to have a lawyer at least look at all the contracts and licenses," the software company lawyer said.

Forty Questions

Once a vendor is selected, Benn asks the user some 40 questions and incorporates his needs into the contract. "Most lawyers don't know the questions to ask," he said. "You have to have a lawyer with a computer background."

Computer lawyer August Bequai said that he "always advises clients not to overuse lawyers because they're expensive." He also recommended that users investigate their internal legal department before going outside.

The fee structure for a lawyer's services often reflects his overhead rather than his ability. Big isn't always best, according to Bequai, who said fees range from $100 to $250. "I can tell you that you can get the same services for $100 that you get for $250 if you shop wisely."

Once the user has hired a lawyer, he should "make sure to get his personal involvement — not an associate just out of law school," Bequai said.

Part of a lawyer's job in drawing up a contract is negotiating price and services to be rendered by the hardware or software purchased. While Bequai warned that lawyers often have "a tendency to get involved in overkill" when it comes to negotiations, Benn said negotiating is imperative to determine who is responsible if something goes awry.

"It's well worth it when you consider the damage that can be done," Benn added.

When dealing with lawyers, the DP manager should remember that not all legal experts are computer experts and should not be expected to make the actual decision on which product is best. "He can't possibly know the corporate planning and strategy," Bequai observed.

Benn agreed with this, adding, "A lot of lawyers have a technical anxiety. We're trying to educate lawyers, but it's hard because computers are a foreign language to them."

Call for Papers

ASSOCIATION FOR COMPUTING MACHINERY (ACM) '83, New York, Oct. 24-26.

ACM is inviting tutorials, proposals for panel discussions and technical papers or surveys to be presented at the conference. Suggested topics include business applications, personal computing, software development, privacy & security, electronic funds transfer, office automation, graphics, hardware innovations, data base systems, simulation, data communications, education, artificial intelligence, computers & society, history of computing.

Authors of papers should submit four copies of their work, typed and double-spaced, not exceeding 12 pages. The deadline for submission is March 7. Authors will be notified of acceptance by May 1.

Papers should be sent to Thomas A. D'Auria, ACM '83 Conference Chairman, City of New York, Computer Services Center, 111 Eighth Ave., New York, N.Y. 10011.

CALIFORNIA EDUCATIONAL COMPUTING CONFERENCE (CECC) '83, San Francisco, Nov. 17-18.

CECC is calling for papers on computers and applications that might be of interest to instructors and administrative personnel involved with computers at the college or university level.

Send two copies of original papers to Fred Ostapik, Director, Computing Services and Institutional Research, San Francisco, 1600 Holloway Ave., San Francisco, Calif. 94132.

INTERNATIONAL ASSOCIATION FOR SOCIAL SCIENCE INFORMATION SERVICE AND TECHNOLOGY (Iassist) '83, Philadephia, May 19-22.

Iassist is soliciting papers on a variety of topics of interest to social scientists, data archivists, librarians, research administors and government records managers. Fifteen papers will be presented in the areas of data services, hardware and software and data files.

A letter of intent or abstract should be sent by Feb. 15 to Sue Dodd, Program Chair, Institute for Research in Social Science, Room 25, Manning Hall 026A, University of North Carolina, Chapel Hill, N.C. 27514.

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Bank DPers Get Interest Reporting Reprieve

By Lois Paul
CW Staff

WASHINGTON, D.C. — DP managers at banks and securities firms received a small reprieve from the Internal Revenue Service when it announced late last month that it is delaying penalties for failure to meet new reporting requirements for interest payments from certain securities.

The Tax Equity and Fiscal Responsibility Act of 1982 stipulates in its "withholding at the source" section that as of Jan. 1, securities firms and banks had to report interest earned by customers on unregistered securities and government obligations. A number of banks expressed problems with meeting this deadline because of the enormity of changes in information-gathering techniques and software required by the law [CW, Nov. 22].

The IRS will waive until April 1 the penalties for failing to report interest on unregistered corporate obligations or U.S. Treasury bills sold at a discount. The interest received by the owner of these short-term securities is basically the difference between the original selling price and the face value that is paid at redemption.

The penalties for failing to comply with the rule for reporting interest on longer term securities will not be enforced until July 1. An IRS spokesman explained that the agency recognized it is difficult for banks and brokers to know the original selling prices of these securities and, therefore, the size of the discount.

The organizations that do not comply with the reporting requirements will be examined on a case-by-case basis. Waiver of the penalties will depend on whether they have made a good-faith effort to comply with the law, the IRS said.

Responding to the IRS announcement, Fritz Elmendorf, assistant director of public relations for the American Bankers Association, which is leading the opposition to the new regulations, said, "We weren't overwhelmed by their [the IRS'] generosity, but they did act in recognition of real problems.

"None of this means that they could be expected to be soft on the ultimate July 1 deadline," he added, referring to the deadline for compliance with the second part of the "tax withholding at the source" legislation. This requires banks to withhold a flat 10% from dividends and interest-earning accounts and pay that 10% directly to the IRS.

Ansi Seeking Views on DIS For Info Systems

NEW YORK — The American National Standards Institute (Ansi) is seeking comment by Feb. 26 on the Draft International Standard (DIS) on information systems that is currently being considered for approval by the International Standards Organization (ISO).

The draft standard specifies elements of data link control procedures for synchronous, code-independent data transmission using the high-level data link control frame structure.

A copy of "ISO/DIS 4335, Data Communications — High-level Data Link Control Procedures — Consolidation of Elements Procedures" costs $15. It can be obtained from Ansi's International Sales Department.

Comments on the standard should be sent by Feb. 26 to Daniel W. Smith, director of operations, American National Standards Institute, 1430 Broadway, New York, N.Y. 10018.

IBM's Rakine Voted Ansi Head

NEW YORK — L. John Rakine, director of standards and data security at IBM, was unanimously elected president of the American National Standards Institute (Ansi). His term began Jan. 1.

Jerome B. Schapire, president of the Dixo Company, Inc., was elected Ansi vice-president. Crifton R. Williamson, assistant vice-president of AT&T, and Richard J. Finegan, vice-president of Liberty Mutual Insurance Co., continue as Ansi vice-presidents.

Rakine has been a vice-president of Ansi since 1980, a director since 1973 and is a member of the board of trustees' executive and finance committees. From 1971 through 1979 he chaired Ansi's International Standards Council.

User Group Formed On Office Systems

PITTSBURGH, Pa. — An office systems user group is currently being formed for users of office automation, office systems planning, micromedia and electronic office systems.

Spokesman Ron R. Cassa said formation depends on the number of people interested.

Cassa can be contacted at Water Reactor Divisions Office Systems Planning, Westinghouse Electric Corp., Box 355, Pittsburgh, Pa. 15230.

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CW-1/10/83

The customer service software people

Future DBMS Seen Handling Symbols, Graphics

NORWALK, Conn. — Developments in data base management systems (DBMS) are leading to software designed to handle graphics and picture/language symbols, in addition to traditional numbers and textual data, according to a recent report from International Resource Development, Inc. (IRD).

The consulting-firm's 155-page study predicts rapid growth in the market for DBMS software packages, even though some of the market will be preempted by "back-end processors" intended to reduce the processing load on the mainframe computer.

According to IRD, IBM is the leading supplier of mainframe DBMS software, followed by Cincom Systems, Inc., Cullinet Software, Inc. and Software AG of North America, Inc.

Rapid Growth Forecast

Particularly rapid growth is forecast for the use of data base software packages for microcomputers. Major contenders in this market include Ashton-Tate, Micro Data Base Systems, Inc., Micropro International Corp. and Software Publishing Corp.

The report noted that the major trends in DBMS software over the past 15 years have been toward relational systems designed to handle increasingly less structured data. "The next step in this development process will include the ability to deal with 'stream of consciousness' information, including audio (recorded telephone conversations, for example) and graphics (from facsimile transmissions, and so forth)."

According to IRD researcher David Ledecky, "the current guiding concept at IBM is the compound document, in which a document in the data base may be comprised of text, audio, pictorial or numerical information." Ledecky believes that IBM and other firms are working on intelligent DBMS software, which will include signal-processing capabilities allowing it to transform data from one form to another. "Soon the user will be able to ask his DBMS software to give him answers in spoken or graphics form; probably the use of graphics will evolve into interactive iconic exchanges with the computer," he added.

I/O Changes Needed

This evolution of DBMS software will require changes by computer manufacturers in I/O processing to comprehend and quantify icons, he continued. The need to transmit whole images, rather than line-by-line text, will call for increased processing speed. New forms of data base storage units will also be needed.

He suggested that changes in the educational system may be required to accommodate the shift to the use of symbols. "Instead of trying to improve literacy in the form of written language, we may have to develop more symbolically oriented educational formats that teach youngsters to think and communicate more in terms of images than in words."

The report, titled "Data Base Management Systems and Backend Processors" (No. 518), is available for $985 from IRD. Further details, including a free description and table of contents, can be obtained from the firm at 30 High St., Norwalk, Conn. 06851.

Survey Released On Software

PHOENIX — Featured in the December issue of the "EDP Performance Review" is the "Tenth Annual Survey of Performance-Related Software Packages," covering over 300 software products from 100 suppliers.

Published by Applied Computer Research, Inc., the software products are grouped under nine general categories, such as communications, hardware monitors, job accounting, operations management and utilities. Basically, the products provide either performance measurement capabilities or direct performance improvements, a spokesman said.

An annual subscription to "The EDP Performance Review" costs $75. The software survey is available separately for $20 from the publisher through P.O. Box 9280, Phoenix, Ariz. 85068.

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Managers on the Move

David Hersh

Donald Macdonald

John Keelin

Alan Frotman

DAVID J. HERSH has been named manager of engineering information systems and DONALD MACDONALD has been named assistant director of management information systems (MIS) for Air Products and Chemicals, Inc., an international supplier of industrial gases, process equipment, chemicals and engineering services in Allentown, Pa.

Hersh will be responsible for program management of the company's Process System Group's engineering information systems development. He will also provide coordination of computer-aided engineering systems on a corporationwide basis.

Hersh holds a B.S. degree in chemical engineering from Drexel University and an M.S. degree in chemical engineering from Lehigh University.

Macdonald will be directly responsible for MIS development, office automation, data resources and MIS long-range planning activities. He joined Air Products in 1974 as manager of MIS Europe and was director of that division prior to his recent appointment.

Macdonald holds a B.S. degree in mechanical engineering from Strathclyde University, Scotland, and a degree in advanced business management from the University of Manchester Institute of Science and Technology in the UK.

•••

JOHN M. KEELIN has been appointed vice-president of information systems for Dravo Corp., a diversified company in Pittsburgh, Pa., engaged in engineering, construction, natural resources development, manufacturing and transportation. He will devote his initial efforts to the further development of Dravo's information and control systems.

Keelin has spent the past 12 years with the Eastern Gas & Fuel Association, where he most recently served as vice-president of financial and systems operations for Eastern Association Coal Corp., an Eastern Gas & Fuel subsidiary. He also has held positions as MIS director and controller for Midland Enterprises, Inc., also an Eastern Gas & Fuel subsidiary.

He graduated from Boston College.

•••

ALAN FROTMAN has been appointed director of information services for the American Institute of Certified Public Accountants in New York, a national professional organization of certified public accountants. He is responsible for the institute's data entry, processing and programming and systems.

Before joining the institute in 1972 as manager of computer services, Frotman was a senior accountant at the public accounting firm of Haskins & Sells. Previously, he was senior internal auditor with American Broadcasting Companies.

Frotman received a B.S. degree in accounting from Brooklyn College.

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FCC Rules on Customer Premises Equipment

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Bell operating companies can continue providing new customer premises equipment to physically disabled customers, the Federal Communications Commission (FCC) decided last month.

In a related proceeding, the FCC also decided that Teletype Corp., an "unseparated" AT&T subsidiary, will not be allowed to market new customer premises equipment after the end of this month.

Underlying both rulings is a provision of the Second Computer Inquiry Decision that says all customer premises equipment as well as all enhanced services offered by AT&T must be marketed through a separate subsidiary unless the company obtains a waiver. As a result, since Jan. 1 customers wanting new terminals from AT&T have had to buy them from the company's new subsidiary, American Bell, Inc., rather than from their local telephone companies.

However, the FCC is being pressured to let the Bell operating companies resume marketing of new customer premises equipment. In November, FCC Commissioner Joseph Fogarty said his colleagues should declare that Computer II's separate subsidiary provision does not apply to the Bell operating companies; Glenn Watts, president of the Communications Workers of America, gave them essentially the same advice.

Watts argued that although the Bell operating companies will be allowed to sell new customer premises equipment after they are divested early in 1984 as a result of the U.S. vs. AT&T antitrust settlement, they may choose not to do so because of the heavy start-up costs. As a result, he said, users will encounter "unforeseen difficulties" in meeting their needs.

Subsequently, key members of the House of Representatives Telecommunications Subcommittee, in letters to FCC Chairman Mark Fowler, agreed that the Bell operating companies would suffer if not allowed to market new customer premises equipment before divestiture. But the congressmen pointedly avoided saying whether the Bell operating companies should be required to establish separate equipment marketing subsidiaries.

The forces opposed to letting the Bell operating companies market customer premises equipment directly are led by the North American Telephone Association, which represents independent manufacturers of telephones, private branch exchanges and related equipment. They fear that unless forced to establish subsidiaries, the Bell operating companies will be able to cross-subsidize surreptitiously their charges for new customer premises equipment with revenue derived from regulated services, thereby undercutting independent competitors.

Another fear is that allowing the Bell operating companies to offer new equipment directly will lead to total abandonment of the separate subsidiary provision of the antitrust settlement and enable AT&T as well as the Bell operating companies to offer both customer premises equipment and enhanced computer-based services directly.

The commission's position, as stated by Fowler at a House Telecommunications Committee hearing last month, is that it will consider letting the Bell operating companies offer customer premises equipment directly, but only if AT&T first submits a request for waiver of the Computer II rules. That's what the phone company did in both of the cases decided by the commission last month.

Datacomm Briefs

MCI to Begin Laying Fiber-Optic Cable System

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — MCI Communications Corp. within the coming year will begin building up to 4,000 miles of fiber-optic cable to link Philadelphia and Chicago with Miami and all the other major population centers in the southeastern U.S. The new circuits will be laid alongside the tracks of CSX Corp., which operates a 27,000 mile railroad network in the area.

The CSX agreement came shortly after MCI worked out a similar arrangement with Amtrak. That fiber-optic cable network, which is to be completed between Washington, D.C., and Philadelphia by the end of this year and extended to New York by March 1984, will add 40,000 circuits to MCI's East Coast transmission plant, quadrupling its capacity.

The first fiber-optic circuits to be laid within the CSX right-of-way will run from Washington to Chicago, an MCI spokesman said. He expects this facility to be completed before the end of 1984.

AT&T, Justice Join to Ask High Court Review Accord

WASHINGTON, D.C. — AT&T and the Department of Justice have asked the U.S. Supreme Court to review the antitrust settlement agreement they negotiated last year. Fourteen states that contend the agreement is unconstitutional had already filed a similar request.

Both camps have asked the Supreme Court justices not to refer the case to the U.S. Court of Appeals before considering the issue themselves. A decision on this latter question is expected shortly.

The states said the key question is "whether a federal court [i.e. the U.S. District Court, which accepted the settlement agreement], acting pursuant to jurisdiction conferred by the Sherman Act, may enter a decree that commands parties to ignore or violate valid state law."

Judge Finds for AT&T Against SPCC

WASHINGTON, D.C. — Federal District Court Judge Charles Richey last month decided AT&T is not guilty of anticompetitive conduct against Southern Pacific Communications Co. (SPCC).

Richey's 602-page decision was eagerly embraced by the lawyers defending AT&T against an antitrust suit being prosecuted by MCI Communications Corp.

"It's the same case," said AT&T lawyer George L. Sanders. He added that Richey's decision will be filed with the appeals court that is now considering an earlier lower court decision that upheld MCI's charges against AT&T and fined the phone company $1.8 billion.

General Dynamics Hits AT&T With Antitrust Suit

WAHINGTON, D.C. — General Dynamics Corp. has filed an antitrust suit against the telephone company. Similar in many respects to the MCI complaint, General Dynamics' brief alleges that throughout the 1970s, AT&T intentionally frustrated competition by insisting that independently made "foreign attachments" to the dial-up network be connected through couplers obtainable only from Bell.

Furthermore, the General Dynamics suit maintains, the couplers were "intentionally" designed to be "unsuitable for their purpose," and Western Electric maintained an insufficient inventory. The complaint also says that AT&T, while insisting that the couplers be installed by Bell technicians, did not adequately train them to do the job.

In 1978, despite what General Dynamics charged were stalling tactics on the part of the phone company, the Federal Communications Commission decided the coupler was unnecessary and replaced it with the present equipment testing/certification program.

The suit alleges that General Dynamics' efforts to sell telecommunications equipment to Bell operating companies were thwarted by "illegal" agreements. One such agreement, according to the complaint, enabled Western Electric to act as the operating companies' purchasing agent for independently made telecommunications equipment. Western Electric purchased the equipment, then resold it to the operating companies after adding a markup, General Dynamics said. The firm contended that this arrangement frequently made its products appear more expensive than those manufactured by Western Electric.

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Called 'False God,' a 'Monster'

Senate Panel Criticizes Computer Matching

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The unrestrained use of computers to enforce government program efficiency is a "false god" and an uncontrollable "monster," members of a Senate subcommittee said last week during hearings on federal use of computer matching.

While saying the goverment "must not reject matching as a concept or the computer as a tool," Sen. Bill Cohen (R-Maine), chairman of the Government Management Oversight Subcommittee, warned that "we are rapidly approaching the day when the human voice will not be able to be heard over the whir of the computer."

Cohen's panel held two days of hearings on the proliferation of federal and state agency matching projects, in which various automated files are compared to detect unlawful benefit recipients. Reagan administration officials supported the use of matching to deter fraud in government programs, but suggested that legislation may be needed to stop abuses of matching and to foster increased use of properly designed matching programs.

Thomas F. McBride, Stanford University law school associate dean and former head of the administration's computer matching project, said the justifications for some matching projects are "distortions of the intentions" of the Privacy Act of 1974. He suggested that properly legislated data sharing guidelines mean program administrators would not have to "go behind the barn to get the data by questionable means."

A panel of privacy advocates, however, told the subcommittee there is little justification for the bulk of past and current matching programs. John Shattuck, national legislative director of the American Civil Liberties Union, said federal guidelines on matching cannot be reconciled with the Privacy Act and called for a moratorium on all use of matching until Congress can study "the long-term consequences of further developing this technique."

Shattuck argued that matching is an unconstitutional general search of the records of large numbers of citizens, whose presumption of innocence is being denied without due process of law. Matching, he said, "is not based on any pre-existing evidence to direct suspicion of wrongdoing to any particular member of the category of people whose records are to be matched.

"While it is true that systematic searches of personal records are not as intrusive as door-to-door searches of houses or places of business, the result is the same: a massive dragnet into the private affairs of huge numbers of people," Shattuck contended.

Privacy advocate Robert Ellis Smith concurred with Shattuck, saying that while there are legitimate matching uses, many projects are legally and ethically improper and often not cost-effective.

During a two-hour exchange between Cohen and subcommittee member Sen. Carl Levin (D-Mich.), McBride and Richard P. Kusserow, Department of Health and Human Service inspector general, argued that matching is necessary to ensure the efficiency of government programs. McBride said at one point that matching is "less intrusive" than other methods of verifying program eligibility.

Kusserow also argued that the concept of matching should not be blamed for what he called the excesses of some matching project administrators. He was referring specifically to a recent match of welfare rolls and bank accounts in Massachusetts, which resulted in benefits termination notices being sent out in cases in which individual welfare recipients apparently had more assets than allowed for welfare eligibility.

Cohen worried aloud that relying on computers to police government programs naturally gives rise to excesses and asked, "Where is the oversight of these computers?" Kusserow agreed, "we have an obligation . . . to tame these machines, to make them do what they're supposed to."

Levin said matching is, in theory, proper for administering govern-

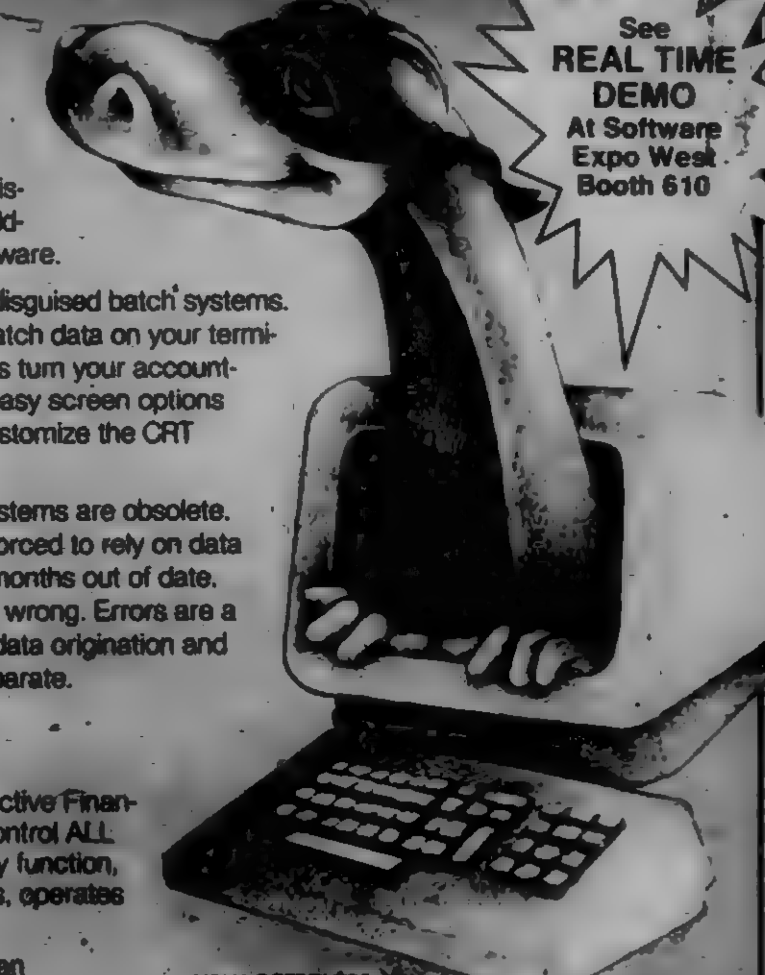
(Continued on Page 18)

Workshop Set On System/38

INDIANAPOLIS — An intensive two-week IBM System/38 programming workshop will be conducted here by Data Processing Services, Inc. beginning Feb. 7.

Topics to covered include System/38 architecture, security, utilization of direct-dialing service, externally described files, query and commands.

Class size will be limited to 10 individuals and tuition is $1,575. Further details can be obtained from Data Processing Services, Inc. at 8604 Allisonville Road, Indianapolis, Ind. 46250.



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Attorney: More Privacy Legislation Necessary

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Constitution affords American citizens very little privacy protection, and even the 1974 Privacy Act, which supposedly governs federal use of personal records, is "essentially unenforceable," according to the former general counsel of the Privacy Protection Study Commission.

Ronald L. Plesser, now in private law practice here, told Congress last week that additional legislation may be necessary to protect individual rights when dealing with the recordkeeping and data sharing practices of government agencies. He spoke during Senate hearings on federal use of computer matching to ensure government program integrity.

Examining the relevance in a computerized society of the Fourth Amendment's guarantee against unreasonable searches, Plesser concluded that "the Constitution gives little, if any, protection to an individual and . . . we must look to legislative solutions, governmental mechanisms and congressional oversight to protect the interests of privacy in our society."

The result of recent court rulings on personal record privacy, especially banking records, he said, indicates "the Fourth Amendment probably cannot survive the technological age." He continued that "in matching programs there are no Fourth Amendment protections. Searches of the records of individuals are no longer limited by the word 'reasonable' as envisioned by the framers of the Constitution."

The tragedy is "that there is no one in the government with the role of enforcing or even overseeing privacy standards," Plesser added.

Matching Evaluated

(Continued from Page 17)

ment programs, but he said the unrestricted use of computers could create an out-of-control "monster . . . We probably can't jump to conclusions, but we better come to some before this technology absolutely consumes us, invading our privacy, dehumanizing us."

Cohen said, "we must not fall down and pray to a false god — the sort of idolatry of looking to efficiency only . . . If you sacrifice privacy to efficiency, you're quite likely to have neither."

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Than in Technical Areas

Exec Sees More Rewards in Management DP

By Bob Johnson
CW New York Bureau

NEW YORK — Although the technical areas of DP are viewed as valuable company resources, more rewards are placed on the management side of computer operations.

That is what Geri M. Riegger, assistant vice-president of operations for Blue Cross/Blue Shield of Greater New York advised attendees to keep in mind when mapping out their career plans at a meeting of the Association of Women in Computing (AWC) held here recently.

Riegger explained that as the computer industry matures, corporations are viewing DP and the people who manage these areas with more value, offering increased responsibility and status. Professional computer people should take advantage of this situation, she said.

Dual Career Choices

In retrospect, the speaker said that in the early days of computers professional DPers thought of themselves and their career paths primarily along technical lines. Now, however, the computer work force has become aware of the management world and faces dual career path choices.

"Many corporations have developed more respect for the technical career side of things and have even developed higher levels of opportunity. But the reality is that the technical side offers less career opportunity than management because companies look at the latter as affecting the bottom line of its business," Riegger explained.

The executive maintained that working on the technical side is an excellent and usually mandatory starting place in DP and those who choose it as their career should pursue it broadly. She added, "They [technicians] should attempt to round out their work by doing things such as consulting and strategic planning. If the technical side is where you want to stay, work at learning your craft, but beware of the limitations."

Riegger also cautioned DPers about the title of technician. She said that unfortunately there is still some ambivalence about that title in some corporations today because of the past associations with "talking in acronyms." She said that DPers should work at having the term changed to "professional," a description she feels reflects a DPer's real activities.

Those DPers who aspire to more money, status and power will find management the way to go, according to Riegger. She said that technicians who are so inclined should not be afraid to venture into the managerial side of things just because they feel "comfortable" or "expert" in their current jobs. She said that career choices should not be based on fear. "Try the unknown, don't cop out," she advised.

Riegger said that the managerial side offers the best relief for frustrated DPers who have problems about constantly taking guidance and not having any say in matters. Management not only offers corporate recognition through money and status, but managerial power, which is a tool for getting things done, she stated.

Technical DPers who want to get to the management side should stress job activities such as marketing, planning and consulting, Riegger claimed. These things help technicians, who typically work alone, in dealing with people, a primary requirement for management responsibility.

Riegger explained that in management, as opposed to the technical side, most activities are done through group effort. For example, a job such as systems programmer, as it was traditionally designed, is one of the worst ways to prepare for DP management.

"This area has too narrow a focus to be valuable for management. If you're on this side and want to become a manager, try to stress the broader aspects of the job, such as user interface," she asserted.

There are several positive ways of preparing for management, Riegger noted. One excellent way is project management and development, which she said combines both technical and managerial skills. She pointed out that it involves planning, communicating, selling the concept to users and management, necessary corrective actions and the allocation of human and financial resources. Another good way is working in computer operations, which she described as a complex, challenging and bottom line-oriented environment.

Reigger said that this corporate "line" area is extremely useful for grooming managers because they are exposed to day-to-day productivity needs and are responsible for managing large hardware and people budgets.

Although management-type experience is valuable for the aspiring DP manager, Riegger said it is important that the DPer remember to keep goals in line with company goals.

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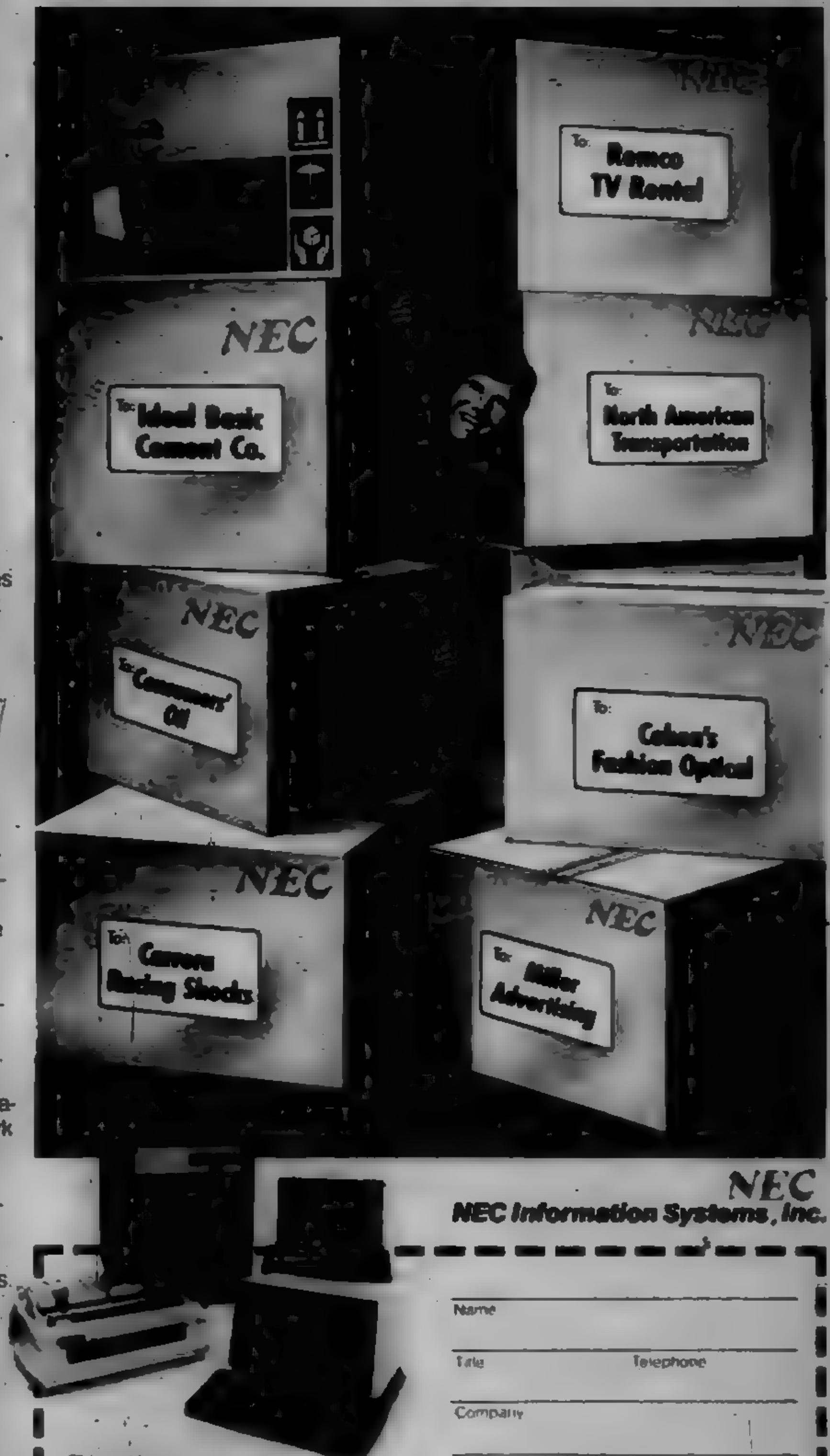

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The Benchmark in World Class Computers

Data Analysis Called Key to Info Engineering

By Bob Johnson
CW New York Bureau

NEW YORK — The decade of the '80s will require companies to manage data as a resource, and the key to this kind of information engineering is data analysis.

That is what attendees at the recent DMW Group, Inc. "World Update '83" seminar were told here by Herb Jacobsohn, vice-president of Database Design, Inc., during a presentation on "Information Engineering and the Corporate Data Resource."

Jacobsohn said that DP organizations will be facing "crucial times" within the next 10 years in an effort to get communications and data together for user needs. Proper data analysis, or as Jacobsohn defined it, "data resource management," is essential to accomplishing this task.

"In the '50s and '60s, data, or files, were managed primarily by report/retrieval systems that for the first time provided users with a way to get at files they needed. But the problems of wanting to access data from not just one, but many files arose, giving rise to 'data management.' This need, in turn, ushered in data base management systems [DBMS] in the '70s," Jacobsohn said.

Original Concept

He maintained that the original concept of DBMS, where one set of data resides separately, providing application independence and security was excellent, but that the implementation of these systems was bad. He added that what we have now is not truly integrated DBMS, which was the developer's primary goal, but files maintained by them.

"The main reason that the data base environment has not reached its intended goals is because the emphasis has always been on processing. We didn't understand data. For years all of our data base management tools were processing-oriented. For example, Isam and Vsam are concerned with the physical structure and access of data," he said.

The result is a situation that requires 80% of the DP budget to be spent on data base maintenance, yielding a shortage of good data base tools and enough people to develop them. Fourth-generation languages, information centers and the like are good tools, but unless data is properly analyzed, DPers will not get good results, Jacobsohn added.

First Step

The ability to view data as a resource, thinking of it in terms of "structure and time-element information" as opposed to raw data, is the first step in effective data analysis, Jacobsohn said. From this point, information analysis can begin.

"The most essential concept in the analysis process is formulating the corporate architecture by defining the strategic objectives of the company. Look at it as a business plan, and from this plan the information architecture, or strategic planning can be done," Jacobsohn noted.

Once the information architecture is in place, including the development of data bases and priorities, development projects can begin.

"Each development project needs data analysis and process analysis, but the data analysis is more important. This is different than what has been going on for the last 30 years, but it is the way to build subject data bases that have data in the right place, stored together and used together," Jacobsohn concluded.

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Will Examine 6,000 Pregnancies

Researchers to Probe CRT Effects on Women

By Jenny Charlesworth
CW Staff

WASHINGTON, D.C. — Researchers at the National Institute for Occupational Safety and Health (Niosh) hope to begin this year the first large-scale study on disease control, focusing directly on women who use CRT terminals, rather than on emissions from the machines themselves.

The proposed study would specifically target women instead of terminals because, "Niosh can find no scientific evidence indicating that there is a reproductive problem from the use of video terminals," according to Bill Murray, chief of the Niosh radiation section. "In this type of study, you don't need to measure radiation coming off the terminals because it doesn't pinpoint any specific agent that people would be exposed to."

Growing pressure from women office workers in the U.S. and Canada has reportedly encouraged this study. Union representatives from hospitals, manufacturing and other areas in the private sector are apparently concerned that the use of CRT terminals may contribute to spontaneous abortions and birth defects.

Examine Records

As part of the study, researchers at Niosh would examine the records of 6,000 pregnancies during the past two years among women members of a particular health maintenance organization, 30% of whom used CRT terminals, Murray said.

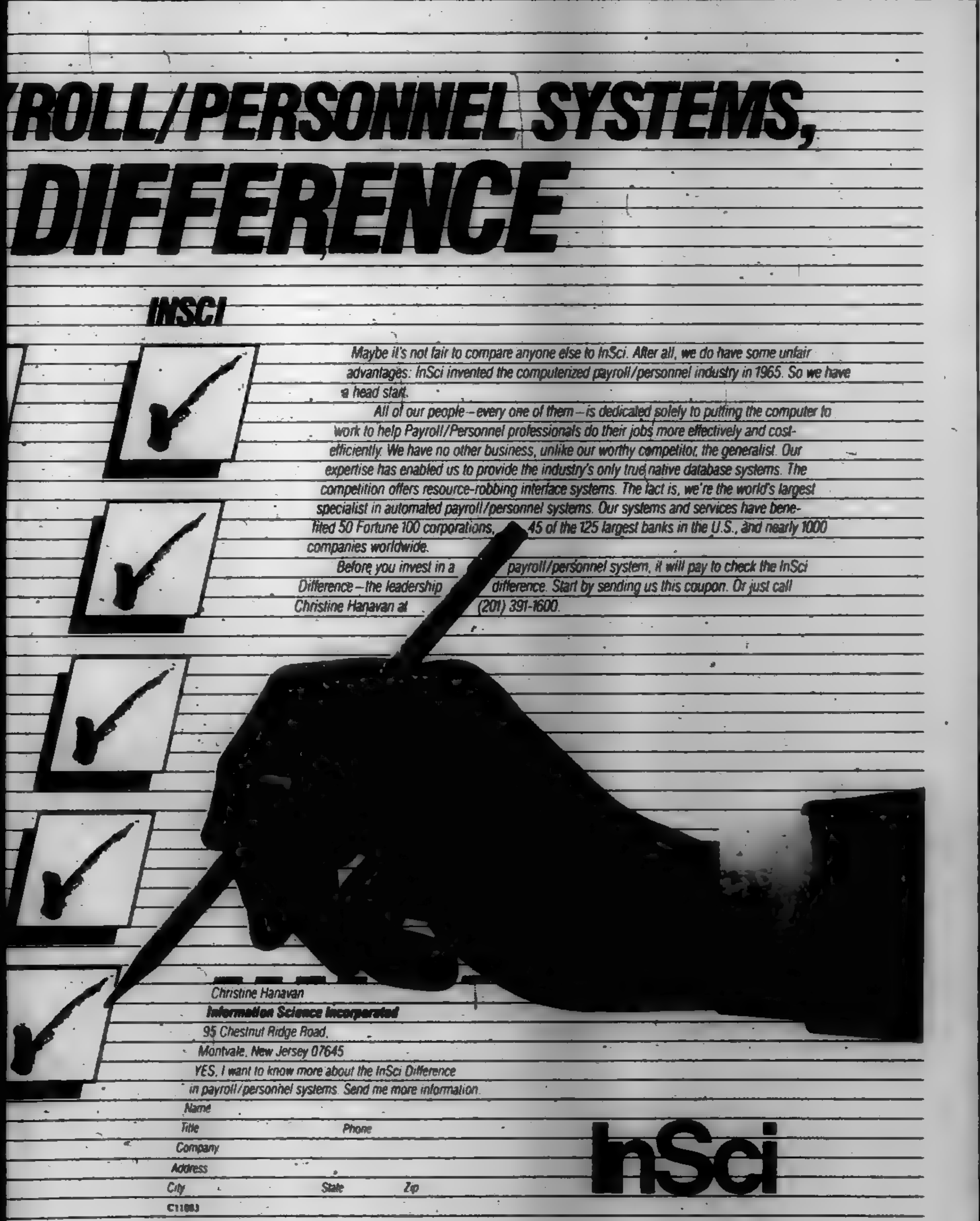
If the study is done, the group at Niosh, led by Dr. Michael Rosenberg, chief of reproductive health activity, will compare the rate of spontaneous abortions among CRT terminal users and nonusers as well as the rate of birth defects among children born to members of the health maintenance organization.

According to a Canadian union spokeswoman, two of six pregnancies reported among one group of office workers at the Surrey Memorial Hospital in Surrey, British Columbia, since 1978 ended in miscarriages. In the remaining cases, one child needed corrective eye surgery and had a deformed foot, another was born a month prematurely, one was born with a bronchial disorder and the fourth was normal [CW, July 19].

Other Hospitals

Employees of other Canadian hospitals who have worked with CRT-based terminals and equipment for several years experienced migraine headaches, sleeping problems, sore throats, intense light sensitivity, back and shoulder problems and, in one case, a tingling sensation and numbness in the right arm, the spokeswoman said.

"Seven to 10 million [CRT terminals] are in use today and the people at Niosh believe that 45% to 50% of the working population will work at least part-time on [CRT terminals] by the year 1990," Murray stated. "If there is a problem, someone better find out what it is."



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Problem Traced to Computer

Winners Misdealt at Tournament

DAVIS, Calif. — When computer science professor Chip Martel recently traveled all the way to Biarritz, France, to compete in a world-class bridge tournament, he probably thought he could forget about data processing for a while.

But at the World Open Pairs, the scores of 160 players (80 pairs) competing over six days were processed by a computer that was blamed for robbing Martel and his partner of first place. "We were listed in the final standings as eighth," Martel said in an interview here.

Martel and Lew Stansby had been keeping track of their scores when the winner of the tournament was announced. After pointing out the problem to the judges, the error was traced to a mixup related to which players were sitting at which tables. As a result, some players received the scores of their competitors.

"We showed them what our scores were for the 30 games," Martel pointed out, and the pair was awarded first place. "The people running the computer program didn't know how bridge tournaments are run," he explained.

Computer scoring in bridge matches, like computer scoring in pro golf tourneys [CW Aug. 2], is becoming more common. "They've been developing computer scoring for a number of years," Martel said.

In addition to handling the scores of some 30 games per pair and posting updated standings on terminals, the computer was also responsible for dealing the cards. A random generator assigned each of the 40 concurrent games the same four hands to make for a more equal competition. "The actual physical distribution of cards was by hand," Martel said, but the computer assigned what cards were to be handed out to the competing pairs.

Martel has been playing bridge for 12 years and with his partner qualified for the World Open Pairs along with 20 other American teams. The 29-year-old University of California professor noted that "among people who play bridge, the most common profession is computer[s]," due to the type of logic required to succeed at the game.

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LOS ANGELES, — Crwth Computer Coursewares has announced the availability of an interactive study course, "Using ADRSII," designed to provide end users of an information center with the use and facilities of IBM's A Departmental Reporting System Version 2.

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Calendar

Week of Jan. 30

Jan. 31-Feb 2, New Orleans — **Communication Networks 1983.** Contact: CW Communications, Inc., Conference Management Group, Box 880; 375 Cochituate Road, Framingham, Mass. 01701.

Jan. 31-Feb. 4, Washington, D.C. — **Structured Analysis/Design Workshop.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011. Also being held in New York.

Jan 31-Feb. 4, Washington, D.C. — **Programming in the C and Unix Environment.** Contact: George Washington University, School of Engineering and Applied Science, Washington, D.C. 20052.

Feb. 1-3, Columbus, Ohio — **CBE Courseware.** Contact: Nancy J. Norris, Vice-President; Public Relations Services, Durborow Associates, Columbus, Ohio 43214.

Feb. 1-3, Washington, D.C. — **Software Test and Evaluation Conference.** Contact: National Security Industrial Association, Suite 901, 1015 15th St. N.W., Washington, D.C. 20005.

Feb. 2-4, Johannesburg, South Africa — **Office Automation and Integrated Information Processing Support Systems.** Contact: Frost & Sullivan, P.O. Box 4026, Johannesburg 2000, South Africa.

Feb. 3-4, Hasbrouck Heights, N.J. — **Unix: Concepts, Functions and Applications.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

Feb. 4-6, Paradise Island, Bahamas — **Caribbean Computer & Electronics Expo 83.** Contact: Ormand Vee Co., Suite 155, 1430 Miner Road, Des Plaines, Ill. 60016.

Week of Feb. 6

Feb. 6-9, Orlando, Fla. — **1983 Telecommunications and Electronic Banking Workshop.** Contact: American Bankers Association, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

Feb. 7-8, Capitol Hill, Washington, D.C. — **Ku-Band Satellite Communications in the '80s.** Contact: Phillips Publishing, Inc., 7315 Wisconsin Ave., Bethesda, Md. 20814.

Feb. 7-9, Chicago — **Data Communications: An Introduction to Concepts and Systems.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Feb. 7-10, Warren, Mich. — **Project Management.** Contact: Bill Schoonmaker, Brandon Systems Institute, 4720 Montgomery Lane, Bethesda, Md. 20814.

Feb. 8-19, Toronto — **Intermediate APL.** Contact: Numetrix, 5th Floor, 3 Church St., Toronto, Ontario, Canada M5E 1M2.

Feb. 8-10, Boston — **Data Network Design: Techniques for Systems Analysis and Design.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

Feb. 10-11, Boston — **Unix: Concepts, Functions and Applications.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

Feb. 10-11, Boston — **Computing Technology for Non-Computer Professionals.** Contact: Data Processing Management Association Educational Foundation, 3420 Kashiwa St., P.O. Box 3608, Torrance, Calif. 90510.

Feb. 10-11, Dallas — **Texas Telecommunications Conference.** Contact: Tommy King, Box 7, Fort Worth, Texas 76101.

Feb. 10-11, Boston — **Computing Technology.** Contact: Data Processing Management Association, Education Foundation, P.O. Box 3608, Torrance, Calif. 90510.

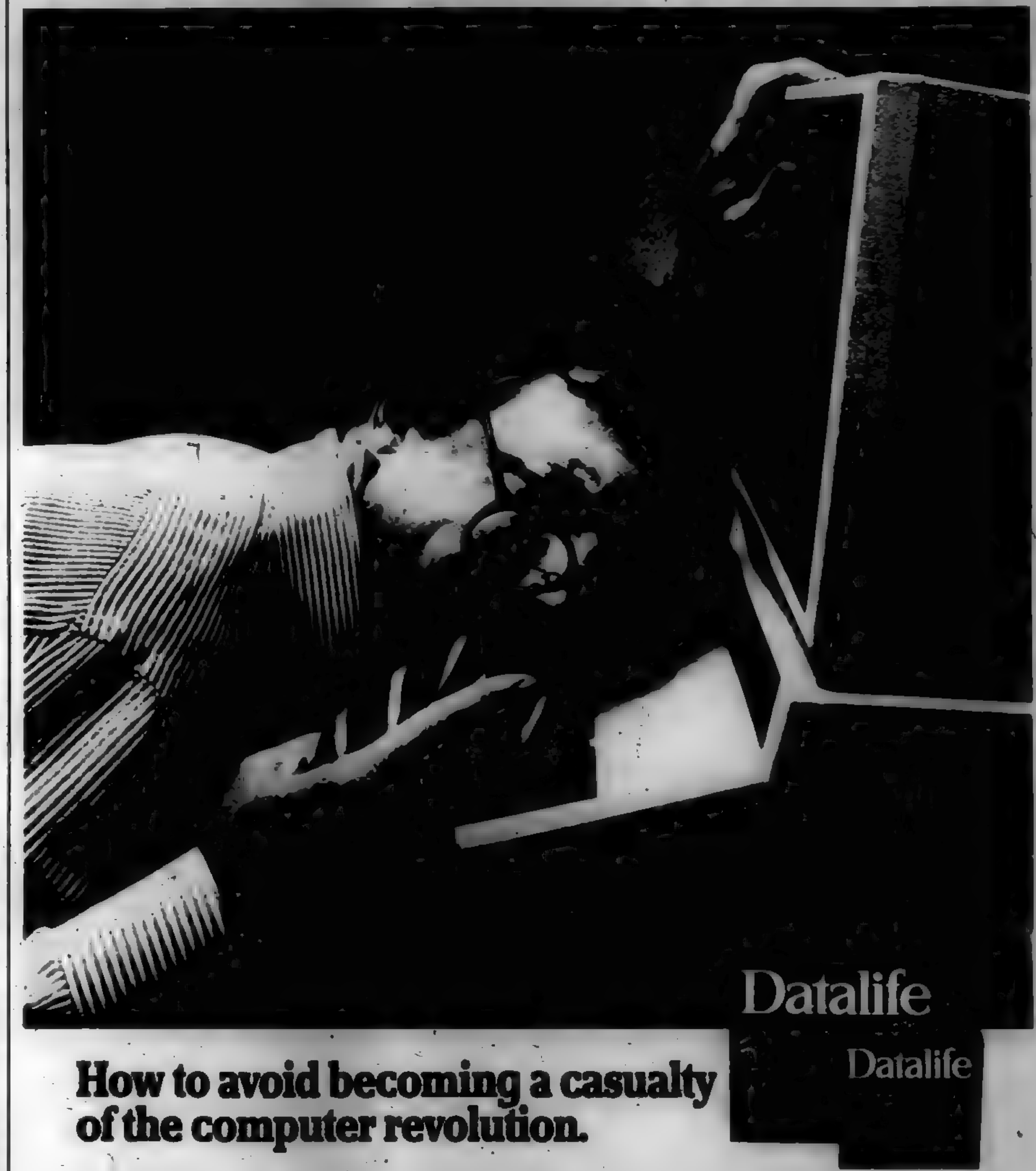
Feb. 11-12, Costa Mesa, Calif. — **Software Requirements, Analysis and Design.** Contact: Data Processing Management Association Education Foundation, Suite 1016, 5959 W. Century Blvd., Los Angeles, Calif. 90045.

Feb. 13-15, Carmel, Calif. — **Institute for Graphic Communications' Tenth Annual Analysis of New Developments and Trends.** Contact: Institute for Graphic Communications, 375 Commonwealth Ave., Boston, Mass. 02115.

The Week of Feb. 14

Feb. 14-15, Los Angeles — **Small Computer Systems in Government.** Contact: U.S. Professional Development

(Continued on Page 24)



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(Continued from Page 23)

Institute, 12661 Davan Drive, Silver Spring, Md. 20904.

Feb. 14-16, Summit, N.J. — **Job Control Language.** Contact: Chubb Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

Feb. 14-16, Summit, N.J. **MVS Dump Debugging.** Contact: Chubb Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

Feb. 14-16, Los Angeles — **Third Annual Conference and Symposium on Computer Security and Disaster Recovery Planning.** Contact: Nancy DeMatteo, Registrar, HSH National Management, Inc., Suite 215, 150 Wilson Bridge, Worthington, Ohio 43085.

Feb. 14-16, Washington, D.C. — **Selecting Small Computers for Government and Business.** Contact: Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

Feb. 14-16, Washington, D.C. — **Data Communications: An Introduction to Concepts and Systems.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Feb. 14-16, New York — **Telecommunications Management: Cost Reduction Techniques.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Feb. 14-18, Washington, D.C. — **Structured Design & Programming Workshop.** Contact: Bill Schoonmaker, Brandon Systems Institute, 4720 Montgomery Lane, Bethesda, Md. 20814.

Feb. 15-16, San Francisco — **Voice Processing: The Voice Store and Forward Arena.** Contact: Probe Research, Inc., P.O. Box 590, Morristown, N.J. 07960.

Feb. 15-17, Orlando, Fla. — **1983 ACM Eleventh Annual Computer Science Conference.** Contact: Association for Computing Machinery, 11 W. 42nd St., New York, N.Y. 10036.

Feb. 16-17, San Francisco — **Unix: Concepts, Functions, Applications.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

Feb. 16-18, New York — **The 1983 SIA Microcomputer Conference & Exhibit.** Contact: Securities Industry Association, 120 Broadway, New York, N.Y. 10271.

Feb. 17-18, San Francisco — **Data Communications: Advanced Concepts and Network Management.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Feb. 18-19, Washington, D.C. — **Advanced Program Control Techniques.** Contact: The Technical Marketing Society of America, P.O. Box 91295, 5959 W. Century Blvd., Los Angeles, Calif. 90009.

Feb. 18-19, San Francisco — **Developing and Implementing Purchase Order Management Systems.** Contact: Sylvia Vogelman, Seminar Manager, Center for Retailing Management, 425 Park Ave., New York, N.Y. 10022.

Feb. 18-21, San Diego — **Second Annual Pacific Computer Expo.** Contact: Pacific Computer Expo, P.O. Box 963, Scottsdale, Ariz. 85252.

Week of Feb. 20

Feb. 20-22, Winter Park, Fla. — **Outlook for Optical & Video Disk Systems and Application.** Contact: Institute for Graphic Communications, 375 Commonwealth Ave., Boston, Mass. 02115.

Feb. 21-23, Philadelphia — **The 1983 Office Automation Conference.** Contact: American Federation of Information Processing Societies, Inc., 1815 N. Lynn St., Arlington, Va. 22209.

Feb. 21-24, St. Paul, Minn. — **Project Management.** Contact: Bill Schoonmaker, Brandon Systems Institute, 4720 Montgomery Lane, Bethesda, Md. 20814.

Feb. 21-25, Irvine, Calif. — **The 1983 Alpha Micro Users Society (Amus) Convention.** Contact: Amus, Suite 210, 1911 11th St., Boulder, Colo. 80302.

Feb. 22-23, Minneapolis — **The Eleventh Annual Midwest Equipment Exhibit & Seminar.** Contact: John Bastys, Countryman Associates Co., 1821 University Ave., St. Paul, Minn. 55104.

Feb. 22-24, Cincinnati — **Fundamentals of Management for Quality Control Supervisors.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020,

Feb. 22-24, Washington, D.C. — **Federal DP Expo.** Contact: The Interface Group, 160 Speen St., P.O. Box 927, Framingham, Mass. 01701.

Feb. 22-24, Washington, D.C. — **Computer Performance Evaluation.** Contact: The George Washington University School of Engineering and Applied Science, Washington, D.C. 20052.

Feb. 22-26, San Francisco — **MVS-SP Internal Logic, Systems Design and Performance.** Contact: Computer Systems Research, Inc., 195 W. Mail St., P.O. Box 45, Avon, Conn. 06001.

Feb. 22-23, Los Angeles — **Software Requirements Analysis.** Contact: Education Foundation of Data Processing Management Association, P.O. Box 91295, 5959 W. Century Blvd., Los Angeles, Calif. 90009.

Feb. 23-25, Washington, D.C. — **Local Communication Networks and Digital Private Branch Exchanges.** Contact: George Washington University School of Engineering and Applied Science, Washington, D.C. 20052.

Feb. 23-25, Los Angeles — **Practical CAD/CAM Considerations.** Contact: University of California, Los Angeles, Continuing Education in Engineering and Mathematics, 6266 Boelter Hall, Los Angeles, Calif. 90024.

Feb. 23-25, Denver — **Computer Micrographics Technology's (Comtec) 12th Annual Conference.** Contact: Comtec, Suite 200, 100 N. Winchester Blvd., San Jose, Calif. 95128.

Feb. 24, Wellesley, Mass. — **Multivendor Data Communications Networks.** Contact: Q.E.D. Information Sciences, Inc., P.O. Box 181, 180 Linden St., Wellesley, Mass. 02181.

Feb. 24-25, Washington, D.C. — **IBM's Systems Network Architecture: A Master Plan for Teleprocessing.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Feb. 24-25, Chicago — **Unix: Concepts, Functions, Applications.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07094.

Feb. 24-25, San Diego — **Computers in Construction.** Contact: CIP Information Services, 11-5-F Spring St., Silver Spring, Md. 20910.

Feb. 24-26, Los Angeles — **Word Processing Supervision Workshop.** Contact: National Institute for Management Research, P.O Box 3727, Santa Monica, Calif. 90403.

Feb 24-26, Short Hills, N.J. — **OS/VS Job Control Language.** Contact: Advanced Training Center, Division of Chubb Institute, 480 Morris Ave., Summit, N.J. 07901.

Week of Feb. 27

Feb. 28-Mar. 2, Houston — **EDP Disaster Recovery Seminar.** Contact: EDP Security, 181 West St., Waltham, Mass. 02154.

Feb. 28-Mar. 3, New York — **An Intensive Seminar in Computer Contracts.** Contact: Brandon Consulting Group, Inc., 17715 Broadway, N.Y. 10019.

Feb. 28-Mar. 4, Washington, D.C. — **Computer Communication Systems and Networks.** Contact: George Washington University School of Engineering and Applied Science, Washington, D.C. 20052.

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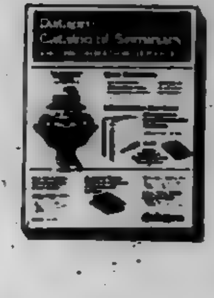

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EDITORIAL

Time for a Change

No publication can stand still and expect to remain vital to its readership. *Computerworld* is no exception. We have never been reluctant to modify our editorial coverage as the dynamics of the computer industry demand.

For example, we have in the past year come to grips with the microcomputer explosion, as many of our readers have. While hardware and software announcements are important and ones that readers should be kept informed of, we believe that the integration of microcomputers into large computing environments is the key management issue for our readers. Our editorial coverage of all aspects of the micro explosion increased accordingly last year, reflecting the realities of the marketplace.

Nor have we been reluctant to categorize news into clearly defined sections of the publication, believing that such categorization makes for quicker and easier reading. Hence, CW is formatted around a news section, technical sections, In Depth, Op-Ed and so on.

But when the lines of computing power between micros, minis and mainframes are blurring rapidly, we believe it makes sense to reflect that change editorially. Thus, with this issue we have merged the Miniworld and Systems and Peripherals sections of *Computerworld* and, we hope, eliminated an artificial editorial distinction between machines that no longer exists in the working world of computers.

Beginning with this issue, almost all hardware information, from micros to mainframes, can be found in one section. — Systems and Peripherals. Almost all software information, including microcomputer software, can be found in the Software and Services section. As in the past, major hardware and software announcements that, in the opinion of the editors, are of most interest to medium- and large-scale users will continue to appear in the front news section of *Computerworld*.

Does the elimination of the Miniworld section also mean we are predicting the death of the minicomputer? Not at all. Like our minicomputer section, which served us well when the lines of demarcation between machines were more distinct, minicomputers have served and will continue to serve a large portion of the computing world admirably. And minicomputers will continue to receive the same kind of editorial attention as in the past. And *Computerworld* will continue to evolve as it has over the past 15 years.

DATA PAST

Five Years Ago
Jan. 9, 1978

WASHINGTON, D.C. — Six senators wrote to the Office of Management and Budget and protested Internal Revenue Service efforts to include a controversial computer system for tax administration in the 1979 budget request that former President Carter was to send to Congress.

— —

NEW YORK — IBM filed a motion for mistrial in the U.S. vs. IBM antitrust case on the grounds that, nine years after this action was started, the government was "dramatically changing its market definition claim virtually at the end of its direct case."

Ten Years Ago
Jan. 10, 1973

NEWTOWN, Pa. — Computer Hardware Consultants & Services, Inc. announced a hardware enhancement for IBM 360/30 users to make their systems operate at speeds comparable to the Model 40.

The 360/30 Accelerator feature was said to double the memory "fetch" rate of the mainframe and to increase throughput.

— — —

WARWICK, R.I. — IBM was using "the resources available to the bureaucratic structure of a large corporation" in an attempt to dissuade a user from moving to another vendor, according to this city's DP director.

Double Trouble

LETTERS

Games People Play

Cultural influences such as family expectations and historical role-playing may have a detrimental effect on young girls considering DP as a career, as the article "Does Space Invaders Savvy Predict DP Success?" [CW, Dec. 13] implies.

It is, however, ludicrous to propose that computer arcade game agility is significantly related to computer programming competence any more than skills in bowling or billiards might be.

Hand-eye coordination, manual dexterity and quick response to attacking spaceships may all be slightly better developed in the arcade. But it is unlikely that the gamesmanship will lead to anything directly related to DP other than a positive attitude toward computers and the (entertainment) uses to which they may be put.

Robert Gordon
Software Product Specialist
TSI International
Norwalk, Conn.

Talk to the Victims

The two articles "DP Managers Deny Ageism" and "Execs Praise Older Workers, But Slow to Hire" [CW, Dec. 6] could leave many readers with the impression that the problem is minor, bordering on nonexistent.

I can assure you from firsthand experience that it is not. Even in today's economic climate, someone with solid, broad experience in data processing would not find it necessary to undergo the hell I did at age 51. No one under the age of 40 would be subjected to it — why should someone over 40 be?

I did not start generating interviews until I had prepared a resume from which it was impossible to tell my age. I have encountered age bias in many forms, in many places. It is alive and well and living all across the land. Why do you think an organization like Forty Plus exists?

The people quoted in one of the articles probably think they are not biased, but their quotes suggest otherwise.

Concerning applicants over 40, John Hoskin said, "[I] do not know how they would react to being supervised by a person younger than themselves." I don't want to shock anyone, but supervisors younger than some of their subordinates is commonplace. My supervisor is at least 12 years younger than I. So what? I respect competence. The concern is both irrelevant and biased.

A DP director went on to say, "I would not hire an older person if [he was] overqualified for job." "Overqualified" is equivalent to "too much experience," which is equivalent to "too many years." Blatant prejudice such as this has to stop — it is wasteful, as well as illegal. Surely, at least waste must be a concept understood and abhorred by most rational managers,

You could perform a great service for all your readers by having more articles about the serious problem of age discrimination and making them more realistic. Talk to the victims next time, not the perpetrators.

Louis Paulson
Vienna, Va.

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. Letters may be edited for purposes of brevity and clarity. Letters should be addressed to Editor, *Computerworld*, 375 Cochituate Road, P.O. Box 880, Framingham, Mass. 01701.

LECHT ON SCIENCE/Charles P. Lecht

Ringing in New Views of DP Systems in '83

Computerworld *this week begins a new column, "Lecht on Science." Written by Charles P. Lecht, the column will explore wide-ranging issues in computer news and technology and will appear in these pages twice a month.*

If you thought change in computer systems technology was accelerating in 1982, you haven't seen anything yet. By this time next year — January 1984 — 1982 will be remembered as a period of relative calm in comparison with what we are to witness in 1983.

So intense will such change be that we will be compelled to alter our most fundamental views of the nature of computer systems and their roles in our lives. New and improved methods of acquiring the powers engendered by computer technology are emerging swiftly and these powers, reapplied to this same technology, are fueling its capacity for change in ever more efficient ways. However unsettling this may be to computer systems users, the net effect of 1983's change should be dramatically positive.

For all the ferocity of its drama, we still have the delicious luxury of exploring this phenomenon and speculating on its meaning in a relatively tranquil state of mind.

Extraordinary Powers

While it has been true all along, we've only recently accepted the fact that computer systems impart to their users extraordinary powers in memory, logic and computation unavailable in our natural world. And sewn together like beads into strands and strands into lattices, computer systems have evolved to become at once their own repository of such powers, a part of yet another's and a portal to still others of lesser or greater consequence.

This came about as a result of the synthesis of computer and communications systems technologies in the 1970s. It is as though the once clear ideas that made a computer system so readily distinguishable from a communications system have been swept away in a tidal wave of change. All the substantial attributes of either are found in the other: miles of circuitry, switches, terminals, signal processors, buffers, memories, conversion devices, software and even wave transmitters/receivers.

This has caused us to redefine our concept of a computer system to mean a network of devices whose communications veins and arteries may vanish into the microscopic world and extend into the macroscopic world. Since all modern systems are collections of processors, some of which may be located remotely, ad hoc runtime system configurations are possible. We send data between devices to be processed and receive the results through massive lattices of wire whose organizational complexities are mind-boggling and whose cross-sectional dimensions vary from micron to meter.

This has led, not unreasonably, to a blurring of our perceptions of a specific computer system and its limits, especially with regard to conventional concepts of temporal and spatial dependencies.

As if this were not enough to handle, contemporary systems linking widely dispersed locations are involving an increasing broadcast component. Thus, our very concept of systems, hard enough to "domesticate" on terra firma, now extends into a new, heretofore alien, dimension, complete with its own set of barely compassable peculiarities.

With its use no longer restricted to mere shipment of data, broadcast is becoming practical as a storage medium for massive files humming soundlessly somewhere between the moon and New York City.

The Titans

Under development in the past few years have been massive computer systems referred to in Bell Laboratories literature as Integrated Services Digital Networks (ISDN). The appearance of these titans underscores our commitment to create ever larger repositories of computer systems power and to distribute this power in ever more effective ways.

I visualize such systems in the form of massive ships suspended in artificial intelligence space. Possessed of their own intelligence and augmented by exogeneous intelligences docked at their ports, they, and the promise of the ISDN technology from which they spring, present a spectacle (and capability) of breathtaking beauty and scale.

As such systems are created in the macroscopic world, so identical systems are aborning in the microscopic world of chips, wherein magnetic field fluctuations invoke device operations and carry messages.

In this world, too, are satellites, transmitters and receivers. The satellite is suspended in a space whose "ether" is silicone, sapphire, metal oxide and exotic otherworld compositions. However flat the world of the silicon chip may seem to the naked eye, some of its elements are separated by distances proportional, within their physical frame of reference, to those separating us from our own space satellites.

Peering through a microscope, we are astounded to see a network of cables and devices more complex than their nearest counterparts in, say, some vast, sprawling, tentacular chemical plant. Not only are we surprised that a third dimension appears, but that the distances traversed laterally on some chips, however confining their edge sizes may seem to us to be, rival those in whose terms we conduct our lives

(Continued on Page 30)

HUMAN CONNECTION/Jack Stone

Salary Differential Can Produce DP Misfits

My article "No Place for Peter Principle on Ladder of Success" [CW, Nov. 15] about DP misfits gave William A. Delaney, president of Analysis and Computer Systems, Inc., a Bedford, Mass., software firm, encouragement to send this letter:

"The age-old argument over the generalist vs. the specialist in management rages on unanswered because there is no absolute answer. It all depends upon the individual who must realize what he wants, can or cannot do and has the foresight, integrity and honesty to admit it.

"Since most DPers know that to turn down an opportunity for a promotion probably kills chances for further advancement, few do. They give it a shot, and sooner or later, most become victims of the 'Peter Principle,' according to which individuals are promoted to the levels of their incompetence. Some have realistic and achievable goals for themselves and their careers. But many do not; they have dreams beyond their grasps. As our parish priest often tells us, we are all too kind and forgiving about our own faults and limitations, but not too kind in noting them in others.

"It is the job of middle and higher management within any organization to spot those capable of further advancement, tell them so, watch the reaction and groom those that respond appropriately for larger responsibilities. None of us likes to judge others, especially in a way that holds them from climbing the career ladder, but the fact is that not everyone can go up. Nor can anyone climb endlessly. All are not suited for broader tasks, and there never are enough vacancies at the higher levels anyway.

"So judge we must, and we try to be fair and honest in our deliberations, remembering we are dealing with people whose careers are in our hands. Promoting someone who you know won't work out at a higher level is not the kindest thing to do. Some managers rationalize such a decision by knowing that if the employee fails, it's the employee's fault, not the manager's."

Hold Manager Responsible

"But that's not the way I look at it. I believe that when a manager allows someone to advance to a higher level — a person who the manager honestly believes is not suited by temperament, experience or some other factors for the higher position — and if failure follows, I hold the manager responsible for the situation.

"The software business, in which the tendency is to promote the best programmer into a management position, is particularly vulnerable in this regard. In many cases, the firm loses its best programmer and gains its worst manager.

"Any manager who has had to intervene and remove, demote or transfer a victim of the Peter Principle well knows how difficult it is for everybody concerned. That is why, in many cases, such people are allowed to remain in positions that are one level above their levels of competence."

Poor Performance

"It's painful to watch individuals in such situations; everyone tries to work around them. In many cases, they perform very poorly — far worse than not knowing answers, they don't know the questions or even what the job entails. And when a manager knows the victims well, the situation becomes very sticky.

"Using a football analogy, the best way to stop a pass is to anticipate it and 'sack' the quarterback before he throws the ball. But if the quarterback dodges the blitz and tosses the ball into the air, it's up for grabs and anything can happen.

"When a manager promotes someone who is not qualified for a higher position, the ball is in the air."

Major Problem

"Company policies that provide higher salaries to managers than those paid to 'technical only' people is the major problem. The common practice is that a manager must receive a higher salary than anyone in his group, which attracts many unsuited for management into it. These people obviously want to increase their incomes and advance in the organization.

"We try not to do that in our firm. Many of our senior technical staff earn higher salaries and work for younger people who are their managers. The fact is that most managers like to deal with people, budgets, clients, schedules and the like, whereas most technical people like to work alone with the computer and do their own things in their own ways.

"Parallel, equal pay scales for both types, with compensation based on individual talents and contributions to the organization — not the title or management position — should be the dominating factor in determining raises and bonuses."

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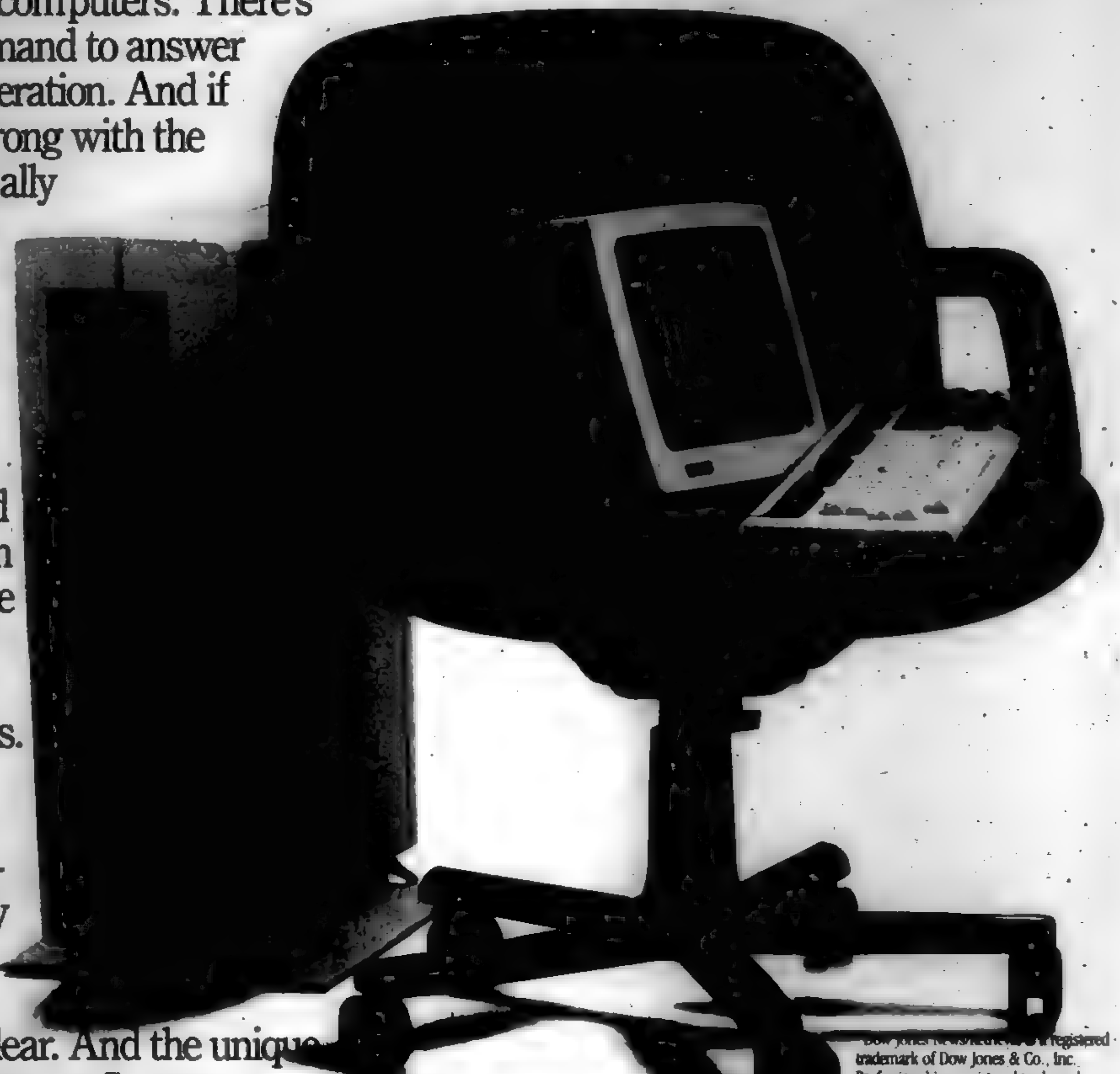

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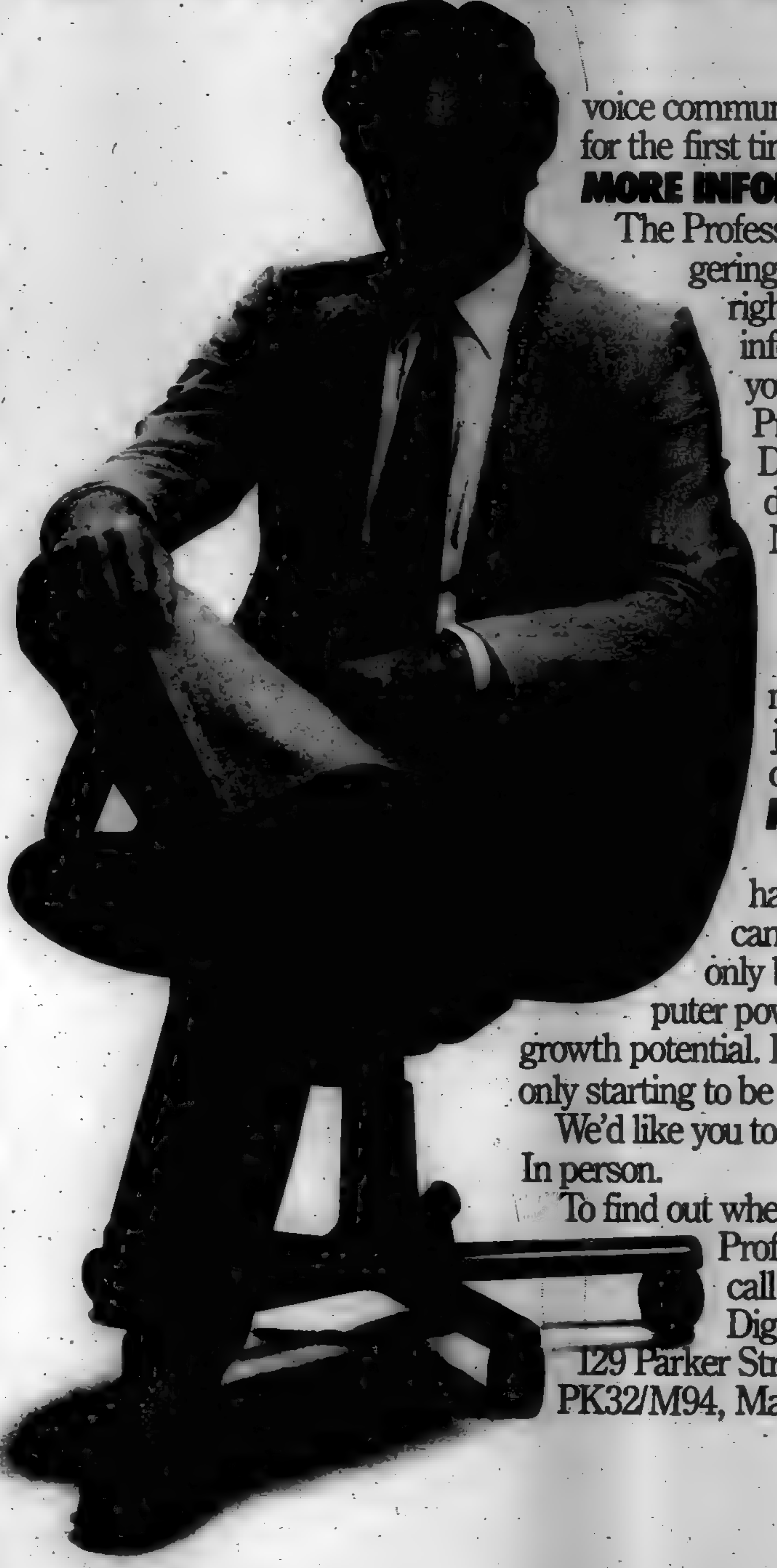

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LETTERS

What Makes a Test Valid

The various views presented on the topic of preemployment tests for programmers in "Programmer Aptitude Tests Worth the Risk" [CW, Nov. 29] were very interesting. There were, however, some statements made that should not go unchallenged.

According to Bradley W. Nelson, during the validation procedure, "Selection is based on a combination of [an applicant's] background, the interview and the test results."

During the validation process, the test is to be administered and filed — not used in the selection process. Use of the test results would reduce the variance of sample test scores and performance scores significantly and be equivalent to throwing out data.

Further, Nelson states that this process will automatically produce a high correlation between test score and performance.

Exactly the opposite is true. Neither the predictor nor the criterion will exhibit much variance. As a consequence, the correlation coefficient will be extremely low.

Nelson's parting thought that "If you developed your own test, you would have nothing to stand on" is patently absurd.

What will determine whether the test being used by a firm is valid is not whether it was "validated" by some test developer in another firm or group of firms. What makes a test valid for a firm is if there is a statistically significant correlation coefficient between scores made by applicants at *this* firm and job performance at *this* firm — nothing else is relevant.

Earl Chrysler
Federal Way, Wash.

New Year Will See New Views

(Continued from Page 27)

in the macroscopic world.

The rate of announcement of technological breakthroughs by the world scientific community and the meaningfulness of each such announcement has been nothing short of astounding in the past few years.

It has been responsible for the current widespread proliferation of personal computers. But more important still, communications improvements have virtually eliminated the practitioner's need to visit a computer, personal or otherwise, to share in its powers: Access to them is obtainable virtually everywhere. The once discrete concepts of personal computer and terminal are in the process of synthesizing.

This phenomenon, along with communications improvements, provides us with fantastic processing potential requiring very little front-end investment. As every such device fulfills the role of being a functional locus in a strand of companion devices, unified by local-area network technology, its usage provides us with the capacity to ignite the strand, energize the lattice of which it is a part and, if only for an instant, invoke the power of a congress of Cray Research, Inc. Crays, Control Data Corp. Cybers, IBM 3084s and others.

The output of this event could vary from the manipulation of a 1G-byte data base to forecasting weather to a few microcoded real-time computer instructions fed like pablum to a baby micro guidance processor embedded in the belly of a bomb. Electronic mail dispatched by Jupiter and carried by Mercury himself could do no more.

This is all happening in 1983. Happy New Year!

Charles P. Lecht is president of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

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Chemical Firm Utilizes Package

Preconversion Planning Struts Its Stuff

DES MOINES, Iowa — Preconversion planning and the acquisition of packaged software to help carry some of the load helped a chemical firm here to complete an IBM DOS to OS conversion early — and for $85,000 less than other proposed conversion methods.

In October 1980, the Chemicals and Coatings Group of Wheelabrator-Frye, Inc. here embarked on a long-range systems plan to assess DP systems for current and future needs. One result of the study was the decision to combine current in-house DOS/VSE systems with Remote Job Entry applications running on a service bureau, under an in-house MVS system. The company decided to trade in its IBM 370/148 for an IBM 4341 Model 1 running MVS and upgrade to a Model II within four months.

The Chemicals and Coatings Group of Wheelabrator-Frye is a group of companies that manufactures products for the printing industry. In 1981 the net revenues for the firm were $280.8 million.

One year after the long-range planning began, project manager Rick Day presented detailed costs for four conversion methods to a DP steering committee. (See Figure 1). Costs were similar for three of the alternatives, but dramatically different for the fourth. "The first idea was to go for a straight DOS/MVS conversion and keep the 148 until the conversion was complete," he explained. The machine was leased through April 1982, so this first alternative meant conversion within five months or an extension of the lease.

Alternative No. 2 called for a straight DOS/MVS conversion by running VM until completion of the conversion. Since VM could not be run on a 4341, this method meant bringing in the

(Continued on Page 34)

Option One	
Three month extension of 370 hardware and software	$ 57,200
Programmer/analyst costs	$ 86,000
Purchase of IBM Assembler converter	$ 6,000
	$149,200
Option Two	
Installation of 4341 Group II two months early	$ 15,700
Additional disk and software costs during 6 month conversion	$ 27,200
Programmer/analyst costs	$ 96,600
One-time VM software purchase and education costs	$ 10,400
	$149,900
Option Three	
Installation of 4341 Group II two months early	$ 15,700
Costs of disk, software during two years until replacement	$108,800
Additional systems programmer for two years	$ 60,000
One-time VM software purchase and education costs	$ 4,400
	$188,900
Option Four	
One-time software cost for UCC-2 and UCC-20	$ 47,200
Programmer/analyst costs	$ 17,200
	$ 64,400

Figure 1

AIC's 'Intellect' Query System Enhanced With Release 201

WALTHAM, Mass. — Artificial Intelligence Corp. (AIC) has unveiled Release 201 of its Intellect query system. Among its enhancements are a graphics display option, improved query handling, an updated lexicon utility and interfaces to IBM's Sequential Query Language/Data System.

The graphics display option links Intellect to IBM's Presentation Graphics Facility (PGF) and enables users to convert automatically Intellect's output to presentation quality graphs, the vendor explained. The five formats that are selectable by the user are pie charts, bar charts, histograms, line graphs and surface charts. Users do not require knowledge of PGF, although more experienced personnel can access the menu screens of this package to exercise additional control over the graphics process.

Intellect now handles incomplete queries by attempting to derive the missing information from questions asked previously, even if no explicit pronoun reference is used. This is designed to determine whether the user is trying to narrow down a search or is simply substituting one search criteria for another. For example, if a user types in the query, "How many administrators do we employ?" and gets an answer, he may then type in, "Under $15K salary?" and will receive this further information about the group described in the first query. Under Series 100 Intellect, this assumption was made only when the subsequent query included an explicit pronoun reference, the vendor noted.

A View command has also been added to enable users, at any point in an Intellect session, to define a data base subset that the software is to use for all succeeding queries. For example, if the user types in "View is all married New executives," all subsequent data retrieval will be limited to those records related to "married

(Continued on Page 32)

VM, MVS Users Get Focus Update

NEW YORK — Information Builders, Inc. has announced Release 4.0 of its Focus data base management system for users of IBM VM/CMS and MVS operating systems.

The release reportedly offers modify/simultaneous update, a new data base component that provides for simultaneous updating of Focus data bases by multiple concurrent users.

Focus transaction processing procedures are specified with English statements that control screen management, data validation and add/delete/change logic, a spokesman said. When operating in simultaneous mode, the procedure includes additional statements that follow a change/verify protocol.

The new release also includes a data ranking facility that ranks data and selects the highest and lowest "n" records; an interface for processing Qsam, Vsam and Isam files; an expanded Help facility; data base buffers that are page boundary aligned; and a new record search strategy.

Modify/SU costs $8,500 separately, with Focus priced from $66,000 to $110,000 from 1250 Broadway, New York, N.Y. 10001.

'QCM,' 'SAS' Joined In MVS Monitor

PITTSBURGH, Pa. — Duquesne Systems, Inc. has released a product for IBM MVS systems that combines its Quantitative Computer Management performance monitor and SAS Institute, Inc.'s Statistical Analysis System (SAS) for a single source of performance and job measurement data.

The QCM/SAS data base and performance monitor also is intended to support the integration of IBM's Resource Management Facility, IMS, CICS, VM and System Management Facility performance data into one system.

QCM/SAS data base and performance monitor gives the user access to the SAS reporting library, standard reports supplied by Duquesne Systems and a supplemental report library, a spokeswoman said. The data base incorporates hierarchical organization, shared system data and shift reporting capabilities. The system maintains data libraries without storing rarely used information or making computations not requested by the user, she said.

The data base is priced separately and includes SAS from SAS Institute and QCM from Duquesne. The latter reportedly includes event-driven I/O measurements, capacity planning statistics and the ability to perform data set placement with QCM's cylinder mapping facility.

The QCM/SAS data base and performance monitor costs $20,000. The data base can be bought separately for $6,000, but the performance monitor is required for use, the spokeswoman said from 2 Allegheny Center, Pittsburgh, Pa. 15212.

Cyber 170 Users Get Package

MINNEAPOLIS — An application management facility for developing report-based applications has been announced by Control Data Corp. for its Cyber 170 computers.

The Information Processing Family provides the ability to produce reports with a reduced number of commands, browse through data files and answer ad hoc requests and process a data base from different views, a spokesman said.

Prices range from $26,000 to $86,000, with monthly leasing priced from $900 to $2,400 from Computer Systems Marketing, Control Data Corp., P.O. Box O, Minneapolis, Minn. 55440.

'Mapics' Users Get Three Modules

ATLANTA — GMD Systems International, Inc. has released three enhancement packages for users of IBM's Manufacturing, Accounting and Production Information Control System (Mapics) Distributed Financial Accounting System on the System/34 and System/38.

Transaction Histories provides audit, control, discrepancy checking and analysis for separate modules including accounts payable, accounts receivable and inventory management. Each module costs $600 for the System/34 and $650 for the System/38.

Cumulative Lead Time Calculator provides Mapics users with measurement of product lead times for production planning, a spokesman said. It costs $700 for System/34 only.

Item Master/Item Balance Synchronization allows checking for consistent duplicate data and creation of item balance records, the spokesman said. It costs $700 for System/34 only.

At the same time, the company announced Mapics/34 Operations Systems Training, a service consisting of structured sessions using company data, workbook and on-site presentation. The course uses a software facility that extracts exercise data from the live data base, the spokesman said.

The training course costs $800/day, including one-time use of the software facility. The software facility costs $1,100 for a permanent license from GMD at Suite 140, 6195 Barfield Road, Atlanta, Ga. 30328.

Plus Two Languages

DBMS Debuts for C Series

CAMBRIDGE, Mass. — BBN Computer Corp. has announced two business programming languages and a data base management system (DBMS) for its Bell Laboratories' Unix-based C series of minicomputers.

Cdibol is said to be a fully compatible Unix implementation of Digital Equipment Corp.'s CTS-500 Dibol. It allows programs writen in Dibol to run without change or modification on a C machine, the vendor claimed.

A version of Microfocus, Inc.'s Level II Cobol reportedly enables the company's C machines to compile and execute programs written in Ansi '74 Cobol. The package can offload batch-oriented applications from a mainframe system and exploit time-sharing capabilities of Unix and C series systems, the vendor said.

The Informix relational DBMS system is a collection of programs used for building data base applications. The package reportedly features interactive query language report writer software.

Cdibol is priced at $3,000. The business software package, which includes Level II Cobol and Informix, costs $7,500 from BBN at 33 Moulton St., Cambridge, Mass. 02238.

'Intellect' Gets Release 201

(Continued from Page 31)

New England executives."

The lexicon utility has been rewritten to facilitate the building of large and complex lexicons and to provide a base for future enhancements, the vendor explained. Changes from the Series 100 lexicon include segmentation of the object lexicon to reduce the amount of virtual memory occupied. With Series 200 Intellect, only a portion of the lexicon is in memory at one time.

The two new interfaces available with Intellect Release 201 are SQL/DOS/ICCF (Interactive Computing Control Facility) and SQL/DOS/CICS.

Intellect 201 runs on IBM and plug-compatible mainframes. The $69,500 price includes a teleprocessing monitor interface and an interface to Software AG's Adabas, IBM's Vsam and AIC's own Derived File Access Method data base management systems.

The enhancements to Intellect will be available beginning in May 1983, and all of them should be released by the end of the year. Intellect 100 users under the maintenance contract will receive the enhancements free. AIC is based at 200 Fifth Ave., Waltham, Mass. 02254.

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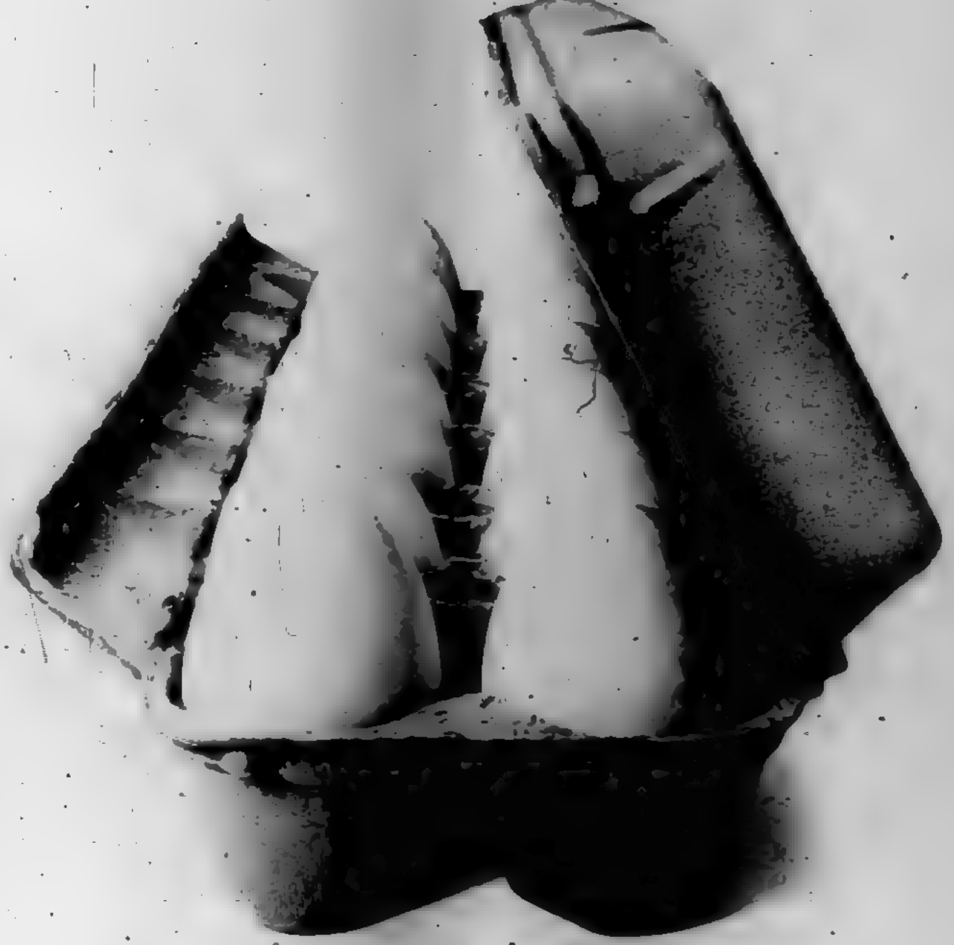

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Preconversion Planning Struts Its Stuff

(Continued from Page 31)

4341 Group II right away.

A third option was to utilize the VM environment until current DOS systems could gradually be replaced by new systems development. This plan also called for installation of the 4341 two months earlier.

The fourth alternative was to utilize UCC-2, a DOS to OS conversion software system from University Computing Co. of Dallas until current DOS systems could be replaced.

Day and his team projected time and expense levels for each step within each conversion plan. Advantages and disadvantages were determined by studying IBM manuals, speaking with DP professionals who had recently completed similar conversions and contacting UCC-2 users. Day created a cost-analysis summary to show a breakdown of the four alternative methods.

By the time Day began DOS to OS conversion plans, MVS experienced programmers were working to convert MVS service bureau programs. Day explained, "We could have hired outside programming help to do the second conversion, but that would have been expensive. So within a month we recommended the purchase of UCC-2 and also UCC-20, an OS JCL generator." His feeling was that UCC-20 could provide a head start by allowing DOS programmers to generate JCL immediately instead of waiting two months for the programmers with MVS experience to be free. "In the final analysis, that two-month head start was an important consideration," he said.

Day had six additional reasons for his conversion plan recommendation.

"When we began the first conversion from the service bureau, we noticed a division taking place among our four systems analysts and six programmers," Day said. "They almost seemed to take sides according to those who were DOS only and those who had some MVS experience. Given the small size of our staff, we didn't like this atmosphere. We felt that by giving all programmers the ability to work under MVS, we not only would avoid a feeling of staff separation, but would be able to get the DOS to OS conversion underway immediately."

Because the DOS to OS conversion occured in the multicompany environment of Wheelabrator-Frye, 630 programs were converted along with approximately 400 jobs or JCL members. Included in the conversion were two accounts payable systems, two accounts receivable systems, online CICS modules, a general ledger system, an inventory system, two sales systems and two payroll systems.

Day and a staff of four shouldered responsibility for the overall project, JCL generation and unit testing.

On April 17, one week earlier than planned, the DOS to OS conversion took place. Day explained, "We were forced to change over everything all at once because we consolidated master files with groups of files under one master file name. The interrelationships of systems and files meant several systems required the use of the same files. Though it was frightening, and we had contingency plans in case of a system failure, nothing like that happened and we had a clean conversion the first time around."

"For our conversion, we generated JCL first and then linked the programs to UCC-2," Day said. "We established our test files, tested the converted systems and validated the test results. We repeated all the steps for each system until we were ready to cut-over to production. We established up-to-date master files, moved all applications to MVS production systems and then followed up the project by reviewing all converted systems, auditing production and writing a follow-up report to management."

Seven-Step Plan Aids Conversion

A smooth IBM DOS-to-OS conversion is made easier with a little preplanning, according to Rick Day, project manager for the Chemicals and Coatings Group of Wheelabrator-Frye, Inc.

"Valuable assistance came from a seven-step work plan which we created before the conversion began. Our plan could easily be adapted by anyone facing a conversion."

The plan consisted of:

- Documenting all systems, including programs, files, operating procedures, backup/restore procedures, restarts and so forth. Once a conversion is underway, previous procedures have proven to be easily forgotten unless they are specified beforehand.
- Evaluating conversion requirements, including people, hardware, software and end user involvement/training.
- Developing installation standards for JCL and also for programming and operating procedures. These were published and strictly enforced throughout the conversion.
- Establishing a detailed conversion plan. This included what was to be done, by whom, when (including start and completion dates) and management approval of the plan. Day said it was particularly helpful as a means of determining if his group was on time, ahead of schedule or needed to accelerate its work to get back on schedule.
- Establishing conversion procedures, including such things as tailoring documentation and establishing sign-off criteria and procedures for program conversion, system testing, JCL generation, file conversion and user validation.
- Selecting a pilot conversion system which will thoroughly test all the procedures. At Wheelabrator-Frye, this involved conversion of an inventory system because it contained both Cobol and assembler programs, Vsam and Isam files.
- Doing a trial run of conversion procedures and tools, revising as needed.

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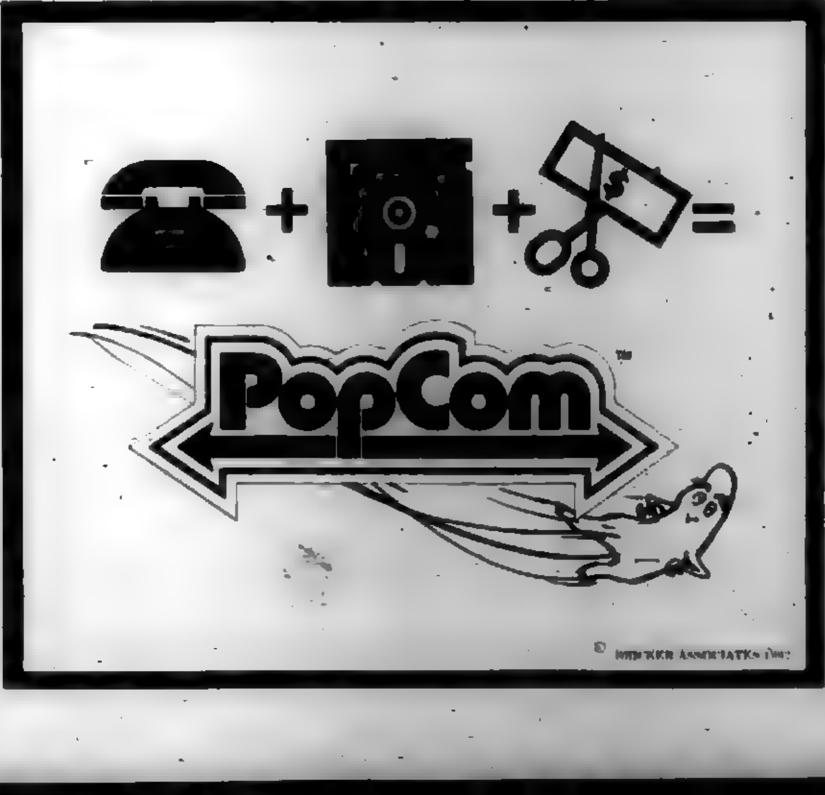

For Honeywell's 'Multics'

Conference Facility Released

PHOENIX — Honeywell, Inc. has announced an electronic conference facility software package for users of the company's Multics Release 10.0.

Called Multics Forum, the product reportedly allows an on-line meeting among multiple participants to take place at different times and locations while providing documentation of events.

Participants need not be present at the same time in order to take part in the meeting, a spokeswoman said. The chairman designates attendees who may observe the proceedings on a terminal screen or enter comments in response to other discussions by entering a transaction specifier code, according to the spokeswoman for the company.

The facility is available for a $150 monthly licensing fee with a minimum term of 12 months.

Honeywell may be reached through P.O. Box 6000/T-60, Phoenix, Ariz. 85005.

Information Science Offers 'Insci/80 Payroll Service'

MONTVALE, N.J. — Information Science, Inc.'s Services Division has entered the payroll services field with the introduction of an integrated, on-line payroll and human resource service.

The Insci/80 Payroll Service is intended for companies with 100 to 15,000 employees.

The service reportedly provides a maximum 48-hour turnaround time from the receipt of data through Applied Digital Data Systems, Inc. Viewpoint 60 terminals — supplied with the service — to the delivery of checks and reports to the user.

There is a basic fee of $35 per pay period and an approximate charge of 50 cents per check, depending on the services provided.

The vendor is located at 95 Chestnut Ridge Road, Montvale, N.J. 07645.

1983
WINTER
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SCHEDULE

Albany, NY	February 8
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Charlotte, NC	January 12
Chicago, IL	February 22
Columbia, SC	February 10
Columbus, OH	February 24
Dallas, TX	January 20
Dayton, OH	February 3
Denver, CO	February 22
Edmonton, ALT	February 24
Greensboro, NC	January 27
Hartford, CT	February 16
Houston, TX	February 15
Indianapolis, IN	February 16
Lexington, KY	January 27
Little Rock, AR	February 17
Los Angeles, CA	January 18
Louisville, KY	January 20
Macon, GA	February 22
Meadowlands, NJ	January 11
Merrimack, NH	January 13
Miami, FL	January 13
Milwaukee, WI	February 9
Minneapolis, MN	January 18
Montgomery, AL	February 1
Montreal, QUE	February 8
Newport Beach, CA	February 16
New York, NY	January 18
Philadelphia, PA	February 3
Phoenix, AZ	January 26
Pittsburgh, PA	February 22
Portland, ME	January 19
Richmond, VA	February 15
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San Diego, CA	February 23
San Francisco, CA	January 18
Savannah, GA	February 8
Seattle, WA	January 25
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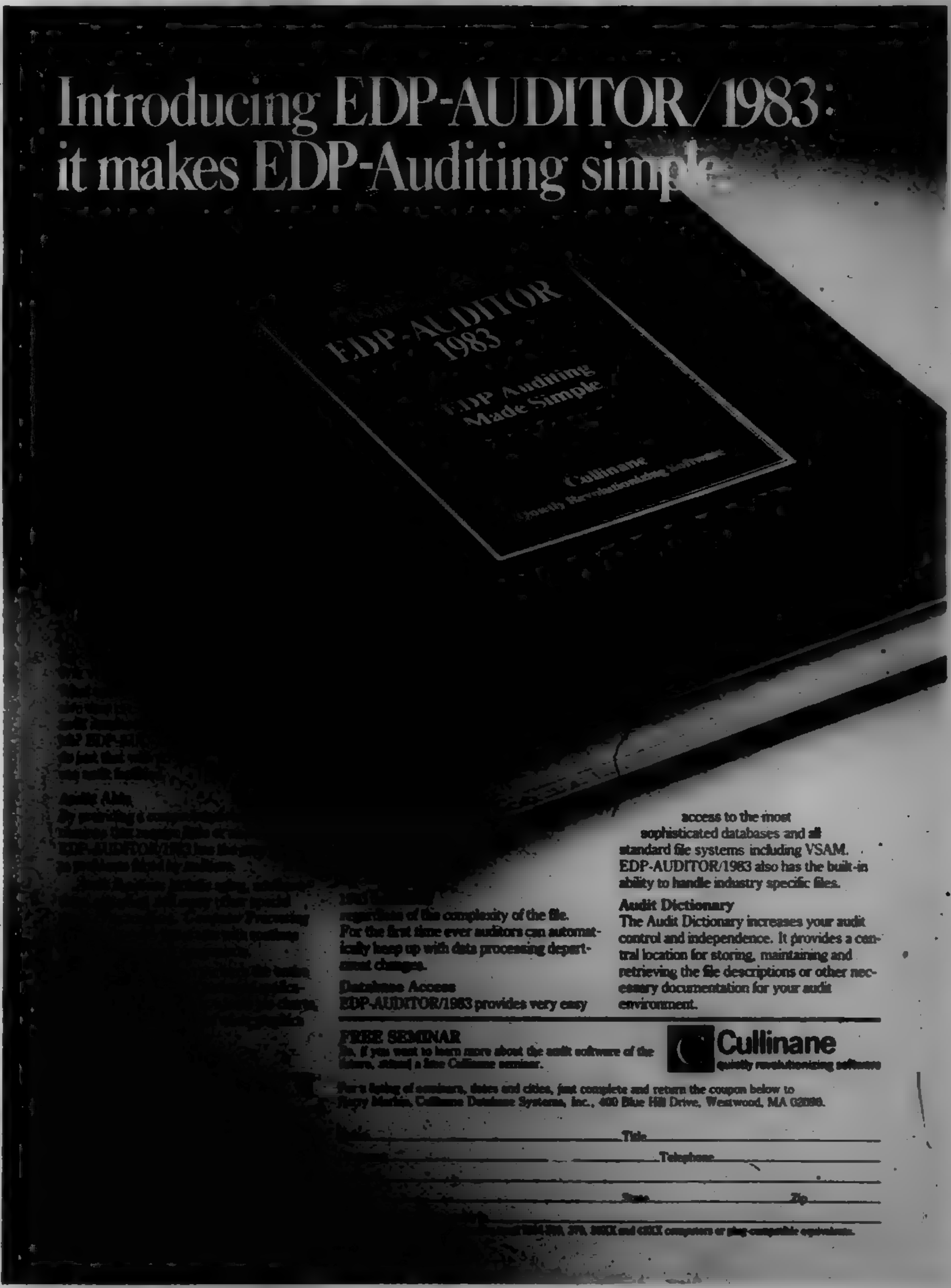

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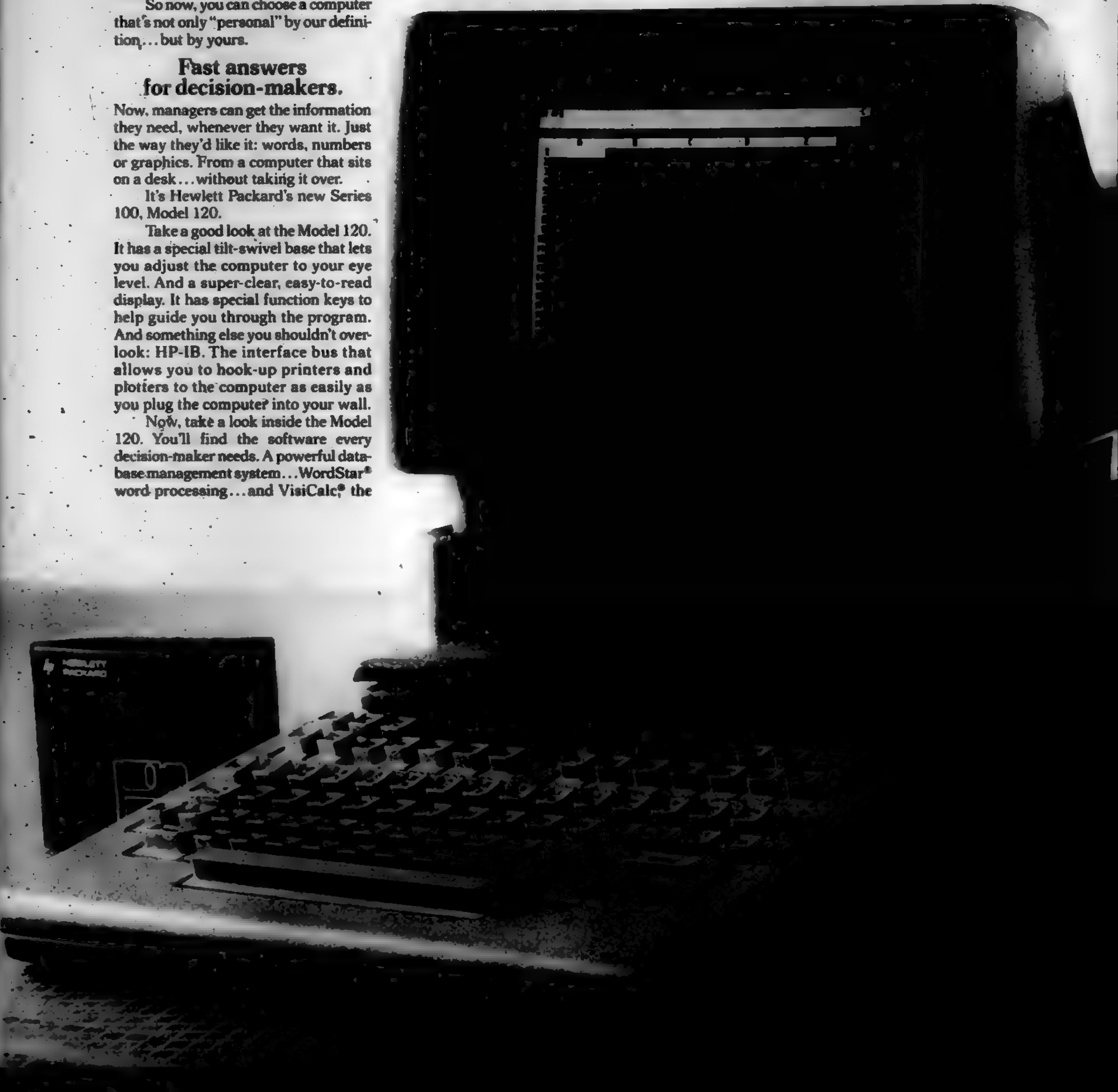

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If you spend as much time out of your office as in it, you'd probably like a way to take your office with you. And now you can—with HP's Series 70, Model 75. It's a powerful, battery-driven computer that fits in your briefcase.

With its typewriter-like keyboard, 16K RAM (expandable to 24K) and 48K ROM, the HP-75 acts like a full-size desktop computer. But it's just a little larger than an airline ticket folder. And it weighs only 26 ounces.

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Back down on the ground, you can use the HP-75's HP-IL interface to hook-up a video monitor, TV screen, printer or plotter.

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Packages Released for PE 32-Bit Processors

DALLAS — Systems Research Corp. has announced three software products designed to operate on Perkin-Elmer Corp. 32-bit processors.

The PE Performance Evaluator (Pepe) is a performance monitoring and measurement device comprised of both hardware and software. Pepe reportedly will summarize activity such as system loading, memory management, I/O and process status to help isolate system bottlenecks. It improves computer system performance, according to the vendor.

The software/firmware is available in three levels — Pepe I, II and III — and it ranges in price from $2,500 to $9,750.

The second product, the Cobol Optimizer, operates on the intermediate Common Assembly Language (CAL) source code produced by PE's Cobol compiler and is said to perform a series of reductions and modifications resulting in a new CAL source. That source, when assembled, reportedly will occupy less memory and will execute in less CPU time than the original version. The price is $4,500.

Finally, the firm's Cobol Global Cross Reference program was designed to give a programmer a quick way of locating data names, copies and literals used in one or more Cobol programs. The package costs $2,750.

Systems Research Corp. is located at Suite 100, 14677 Midway Road, Dallas, Texas 75234.

DSS Unveiled For VAX/VMS

TORONTO — A decision support system for Digital Equipment Corp. VAX/VMS systems has been introduced by The Management & Planning Software Group (MPS).

Interactive Decision Support System (IDSS) features include a full-screen facility that enables users to enter data on-line directly onto an electronic spreadsheet, a built-in editor that checks for errors, true English language capability, integrated data base with data dictionary and full color graphics, according to the vendor.

IDSS is currently available on DEC VAX computers.

IDSS is priced between $30,000 and $60,000. MPS is located at Suite 201, 201 Consumers Road, Willowdale, Toronto, Ont. Canada M2J 4G8.

'CBLVcat/Vtoc' Gets Addition

REXDALE, Ont. — Compute Bridgend, Ltd. (CBL) has announced the addition of Vsam tuning and subset displays to its Vsam Catalogs/Volume Table of Contents (CBLVcat/Vtoc) package for IBM systems running under DOS, OS and VM/CMS operating systems.

The package was designed to provide savings on required direct access storage device space, increase list catalog processing speed, provide faster subset listings for interactive prime-time monitoring, avoid Vsam defaults, provide Vsam-managed SAM support and an improved Vtoc display/modify for DOS and CMS users.

A subset feature displays the number of records that can be held in the primary space allocated to the file, the vendor said.

CBLVcat/Vtoc costs $3,000 or rents for $75/mo from CBL, Suite 107, 30 Baywood Road, Rexdale, Ont., Canada M9V 3Z1.

Interface for Printers, Graphics Systems Out

CARROLLTON, Texas — A software package said to interface host computer graphics systems to phototypesetters and high-speed electronic printers has been announced by Image Research, Inc.

Plot 97 was designed to print business and technical graphs, schematics, flowcharts, circuit diagrams and line art on nonimpact printers and phototypesetting equipment. Output can be readily merged with text, the vendor claimed.

The system supports output to the Xerox Corp. 9700 and the Autologic, Inc. APS 5 phototypesetter. Plot 97 costs $19,500; the firm can be reached through P.O. Box 116135, Carrollton, Texas 75011.

Test Sites Needed for Micro-CPU Link

ELIZABETH, Colo. — A consultant here is putting out a call for potential test sites for a micro-mainframe link software package that is currently running, but not ready for full release.

Duane O'Shay is looking for interested users who would be willing to participate in the definition of enhancements to the product prior to the general public marketing.

The software currently supports normal terminals (live keyboard and CRT); nested transmit files (up to 12 levels); parameter passing between levels (up to 35 parameters); and key capture mode.

In addition, it saves received data on disk and can transmit, receive and key capture data at the same time, he said.

Wait conditionals reportedly are time (up to 99 sec); line feed; character strings; and operator continue. It includes delay directive and a mode for nondisplay of commands to preserve the CRT screen for screen-driven programs.

O'Shay said the software has the capability to execute a planned terminal session without operator intervention.

O'Shay can be contacted at 36259 Forest Trail, Elizabeth, Colo. 80107.

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Security Package Unveiled For Honeywell's DBMS

MECHANICSBURG, Pa. — Caci, Inc.- Federal has announced an on-line security product called Security-II for users of Honeywell, Inc.'s Data Management IV Transaction Processing data base management systems on Honeywell Level 66 and DPS 8 systems under Gcos.

Security-II was designed as an on-line, real-time system, providing protection for the transaction processing environment as well as individual transaction processing, the vendor said. Through the use of identification codes and passwords, the package reportedly prohibits on-line access of unauthorized users.

In addition, transaction processing is limited to authorized user transactions, as defined by the security administrator. Security verifications and modifications are maintainable on-line.

Security-II is available for $7,300 from Caci, Inc.- Federal, Advanced Systems Department, 5010 Trindle Road, Mechanicsburg, Pa. 17055.

Editing Software Fits DEC PDP-11

SUDBURY, Mass. — EEC Systems, Inc. has announced an interactive command-line editing package for Digital Equipment Corp. PDP-11 systems running under the RSX-11M/Plus operating system.

ICE-11M is said to provide RSX system users the ability to edit command lines before or after their execution. Command lines may be edited using cursor/function keys to insert or delete characters or words.

As command lines are dispatched, they are stored by ICE-11M on a push down stack to a maximum depth of 20. Each historic command line may be recalled, edited and automatically reissued, the vendor said.

ICE-11M costs $995 for a single CPU license from the firm at 327/E Boston Post Road, Sudbury, Mass. 01776.

Job Stream Generator Out For HP 3000 MPE Users

CINCINNATI — An interactive job stream generator for the Hewlett-Packard Co. HP 3000 Multi-Programming Executive (MPE) operating system has been announced by Thoman Software Corp.

Batch/Generate operates through user-specified model files that are used as input to the program. At run-time, the program prompts the terminal operator to enter values for variables in the model file.

These values are inserted into MPE commands and data and used to control generation. The generated temporary file is then streamed and purged. Batch/Generate features conditional and repetitive generation, nesting of all functions and inclusion of other files.

The price is $500 from 1821 Summit Road, Cincinnati, Ohio 45237.

Air Quality Tool Out on UCC T/S

DALLAS — University Computing Co. (UCC) has announced an interactive air quality modeling package of three modules available on a time-sharing basis through UCC's Control Data Corp. Cyber-based service center.

Unamap uses emission and meteorological data to calculate projected air pollutant concentration, a vendor spokesman said. Traggy is an interactive puff trajectory model for applications ranging from accidental releases to long-range transport. Gplot is an interactive scientific plot package that plots best-fit curves on linear, log and probability scales and is suitable for publications, according to the spokesman.

A typical time-shared run costs $150 to $200, a spokesman said from 1930 Hiline Drive, Dallas, Texas 75207.

Language Sort Out for VAX-11

LEXINGTON, Mass. — Evans Griffiths & Hart, Inc. has announced Vsort, a machine-language sort for the Digital Equipment Corp. VAX-11 under VMS.

The software reportedly handles fixed-record-length, relative, sequential and its Ross/V files with support for both span and nonspan records.

Vsort is said to accept Ascii, integer, floating point and packed decimal keys. Integers may be signed or unsigned; single- or multiple-precision. Floating-point numbers may be single-, double-, G- or H-precision.

The package contains a standalone version of the sort and two callable versions that may be linked with applications, the vendor said. The standalone version provides an interactive user interface.

A single-CPU license for Vsort is $2,500. OEM and quantity discounts are available, the vendor said from 55 Waltham St., Lexington, Mass. 02173.

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'DMS/HP,' System Tool Released for HP 3000 Users

VAN NUYS, Calif. — A distribution management system for the Hewlett-Packard Co. HP 3000 series of computers has been released by Coastal Information Systems, Inc.

Called DMS/HP, the package is an order processing, financial and accounting system for wholesale distributors and manufacturers, a spokesman said. The on-line, integrated package includes modules for order processing and billing, distribution requirements planning, accounts receivable and others.

A parameters file allows the package to be field-customized for security, tax treatment, discounts and terms. The software includes an automatic system maintenance subsystem for "hands-off" source file maintenance and librarian functions.

The basic system is priced at $55,000 in object code, with source code costing an additional $18,000 from Suite 110, 15643 Sherman Way, Van Nuys, Calif. 91406.

'Bill of Distribution' Fits IBM CPUs

ATLANTA — American Software, Inc. has announced its Bill of Distribution package for IBM mainframes running Vsam/CICS.

The package reportedly operates with the firm's Distribution Requirements Planning package to provide features for handling complex networks, simultaneous sources or replenishment and assemblies and product substitutions.

The package costs $34,000, the vendor said from 443 E. Paces Ferry Road, Atlanta, Ga. 30305.

'Aideset' Out for Wang Vs

NEW YORK — A development aid for the Wang Laboratories, Inc. VS line of minicomputers has been announced by Start Systems, Inc.

The Advanced Interactive Development Environment (Aideset) interfaces directly with the Wang VS Command Processor to provide a structured programming environment, according to a spokesman for the vendor.

The software features a Cobol frame generator that generates a structured Cobol frame program tailored to an installation and an enhanced message queuing facility said to let users receive incoming messages on demand.

Aideset reportedly can be tailored to work in any program development environment running on the VS line under Wang operating system Release 5.0 or better. Aideset costs $2,500 from the firm at 1120 Ave. of the Americas, New York, N.Y. 10036.

GAP Analysis Announced

PALO ALTO, Calif. — Remote Computing Corp. has announced a GAP analysis service available in conjunction with its Savings and Loan Planning financial planning system.

The GAP analysis reportedly shows the interest rate maturity of balance sheet items and highlights out-of-balance (GAP) positions. GAP analysis provides for forecast GAP positions up to three years in the future, a spokesman said.

The service includes features that allow users to design their reports. A summary of the balance sheet or a detailed breakdown of specific categories is available. The package also handles matching of reverse repurchase agreements and specific investment securities.

A typical GAP run costs $35 to $50 from 1076 E. Meadow Circle, Palo Alto, Calif. 94303.

BCC Enhances 'SB-5' Package

ELMWOOD PARK, N.J. — Business Controls Corp. (BCC) has announced screen-painting and report-painting enhancements for its System Builders (SB)-5 Automated Cobol Program Development System, Version 2.3.

The new screen-painting feature of SB-5 was designed to permit Cobol programmers to reduce the time required to develop entry and inquiry programs. The new report-painting capability was designed to facilitate the programmer's development of complex report programs. Because screen- and report-painting are easy to perform, nontechnical users can create their own less complex, single- or multiple-file reports and inquiry programs without programming knowledge because no additional code or SB-5 logic parameters are needed, the vendor claimed.

SB-5 reportedly automates the design, development and documentation of Cobol application software on all major Digital Equipment Corp. computer systems. These screen- and report-painting enhancements are about to be distributed to all supported SB-5 users and will be standard in all SB-5 systems licensed in the future. List price for SB-5 licenses range from $10,000, depending on the target computer system.

BCC is located at 507 Boulevard, Elmwood Park, N.J. 07407.

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Sharing their insights on OA planning, integration and implementation issues are, among others: Dr. Michael Hammer, associate professor at MIT; Dr. John McQuillan, assistant to the president of BBN Information Management Corp.; Patty Seybold, principal editor of The Seybold Report on Office Automation; and John Walsh, Communications director of Avon Products, Inc.

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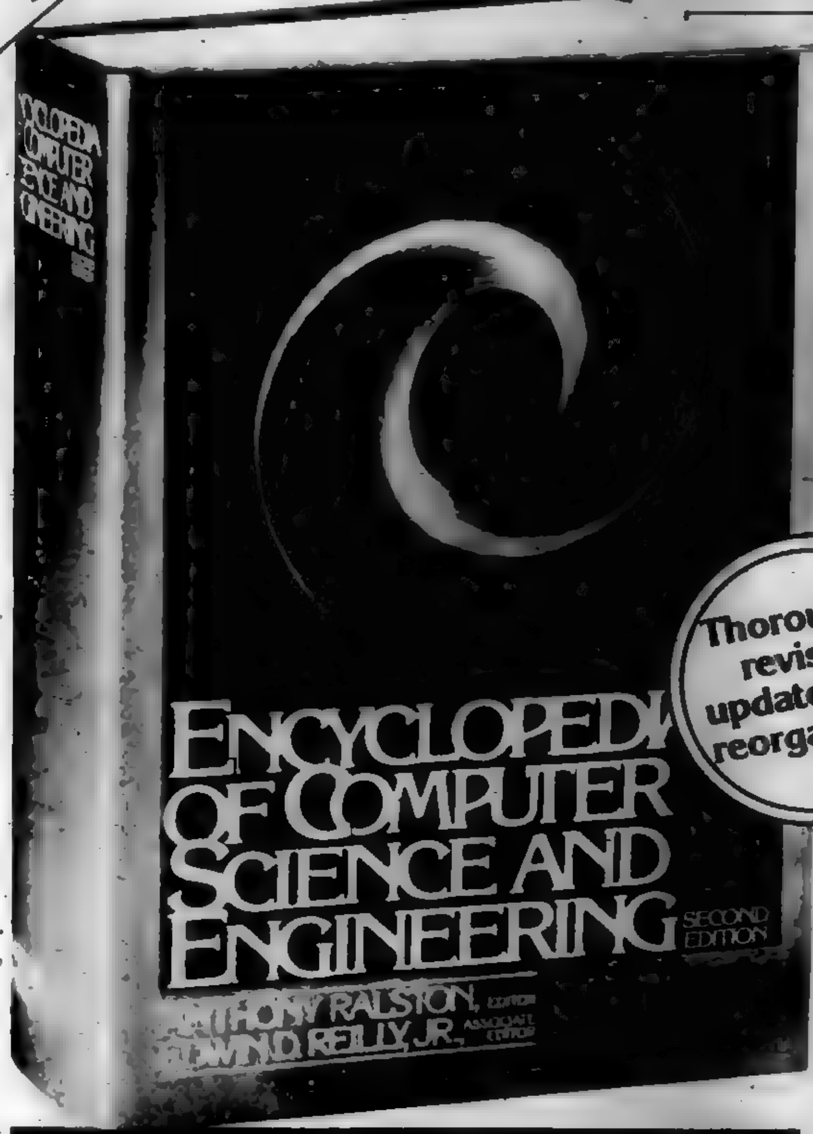
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SECOND EDITION
ANTHONY RALSTON, EDITOR
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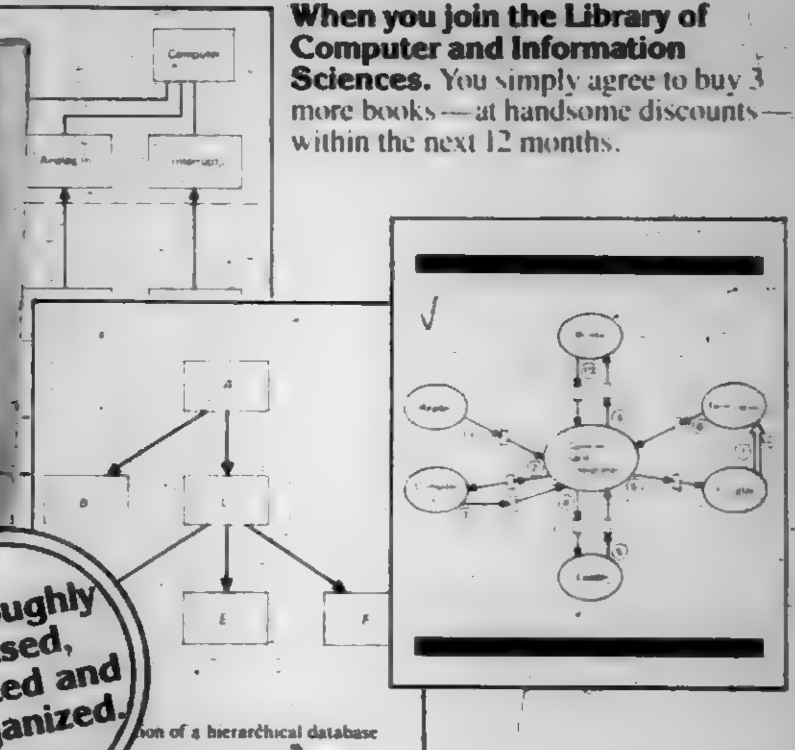
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Harris Mini Series Gets CAD Package

FORT LAUDERDALE, Fla. — Harris Corp. has announced an interactive drafting software package for its series of minicomputers.

The Design Oriented Graphics System is a computer-aided design (CAD) package for producing engineering drawings. Drafting commands can be controlled from a digitizing tablet or screen menu, the vendor claimed.

The package reportedly will spool plot files for hardcopy output as well as archive drawings into a data base. Symbols and shapes can be defined and stored in the library. Functions include view select, facilities, symbols, measure, line, hatch, text, line type, dimension, delete, archive, copy, drag and construct.

The license fee is $26,000, or $8,000 for colleges and universities. A six-month trial lease is $6,000, applicable to the full license fee from Harris Corp.'s Computer Systems Division, 2101 W. Cypress Creek Road, P.O. Box 6200, Fort Lauderdale, Fla. 33310.

Includes Sort Package

CCS Unveils Four HP 1000 Aids

ABERDEEN, N.J. — Corporate Computer Systems, Inc. (CCS) has announced four products for users of the Hewlett-Packard HP 1000 computer.

Soft Plus is a sort package that reportedly sorts records in ascending order using up to 80 key field/record.

Image Interface is a set of subroutines said to reduce the programming time required to use HP's Image data base systems.

Transparent Activity Sampling Program (Tasp)/1000 reportedly permits users to produce system activity reports at user-selected intervals. Separate sampling modules collect information on program status change, I/O controller availability and CPU idle time.

Finally, Terminal Manager provides terminal data entry and control for most HP terminals, a spokeswoman said.

Prices range from $800 to $3,800 from CCS at 675 Line Road, Aberdeen, N.J. 07747.

Tymlabs Unveils Tool For HP 3000

AUSTIN, Texas — Tymlabs Corp. has announced a software facility for the Hewlett-Packard HP 3000 computer that reportedly allows both batch and on-line processing to be controlled from any HP 3000 terminal.

Called Menu Processor, the package is said to allow users to initiate an on-line program, start a batch update run or print a report with one keystroke. Features include multilevel menu capability, logging of user processing, IF/THEN/ELSE facility, forms alignment, task initiation by name or number, data embedded in tasks, distributed operation of batch systems, standardized user/application interface, shareable menu and task files and multiple step selection with sequential execution, a spokesman said.

The package costs $850 from 211 E. 7th St., Austin, Texas 78701.

T/S Stock Market Data Bases Out

TORONTO — I.P. Sharp Associates Ltd. has made three stock market data bases available on their time-sharing system.

At the same time, the company announced an APL work space documentation aid available on a time-shared basis or on any computer running Sharp APL.

The United States Stock Market data base gives current and historical prices and volumes for securities on all U.S. exchanges, including common and preferred stocks, warrants, rights, units and mutual funds. Exchanges listed include the New York, American, Montreal, Midwest, Boston, Pacific, Toronto and Philadelphia-Baltimore-Washington.

The *Financial Times of London* Share Information data base provides information on securities listed on the London Stock Exchange. Both published and unpublished share prices are included, a spokesman said.

The *Financial Times of London* Actuaries Share Indices gives index values and associated information for each of the 42 Institute of Actuaries Indices published in the *Financial Times*.

WSDOC, the APL documentation aid, reportedly can be used to provide documentation during system building or after program completion. Features include a cross-reference table of all identifies for each function, a tree-structure diagram of the calling hierarchy of all functions and a listing of every package's objects.

Timeshare prices for all packages are $1/hour connect time, 25 cents to 45 cents/CPU and 70 cents/thousand characters transmitted or received. Perpetual license fee for WSDOC is $15,000 from Rosanne Wild, I.P. Sharp Associates, Suite 1900, 2 First Canadian Place, Toronto, Ont. M5X 1E3.

'Sttar' Fits System/34

HIBERNIA, N.J. — Direct Access Software Index, Inc. has introduced a time/equipment/expense tracking and accounts receivable system for the IBM System/34.

Sttar tracks time and accounts receivables, as well as billing, personnel and equipment in an on-line, interactive mode. Sttar is said to deliver audit controls, on-line edits, master file updates, automatic retainer fee accrual.

A one-time license fee for Sttar costs $7,500 from the firm through P.O. Box 33, Hibernia, N.J. 07842.

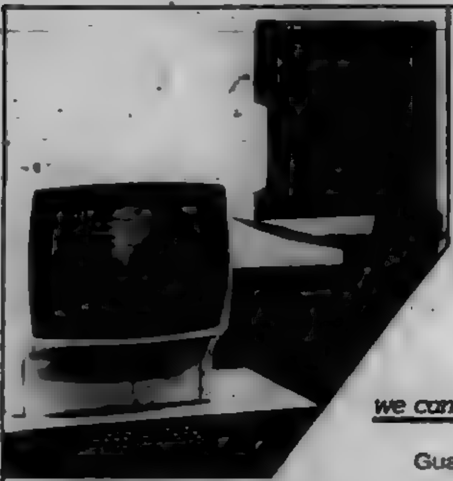
'Payroll System' Fits VAX

CONSHOHOCKEN, Pa. — Personnel Data Systems, Inc has announced that its Payroll, Personnel and combined Payroll/Personnel Systems now operate in the Digital Equipment Corp. VAX-11/VMS environment using DEC's Forms Management System.

In addition, the Payroll System reportedly now satisfies the reporting requirements of the Internal Revenue Service's Individual Retirement Account-related 401(k) legislation.

The Payroll/Personnel System was designed to run on any major vendor's hardware with any teleprocessing monitor and any file-access method. All but I/O routines are written in Ansi Cobol.

Prices range from $18,000 for the basic Payroll System to $75,000 for on-line Payroll/Personnel, a spokesman said from 15 E. Ridge Pike, Conshohocken, Pa. 19428.



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Off-Hours Help Offered by HP

PALO ALTO, Calif. — Hewlett-Packard Co. has announced an emergency software support program for users of the HP 3000 computer who experience operational problems outside of regular working hours.

The Off-Hours Emergency Assistance program reportedly offers troubleshooting help on weekends, holidays and from 5 p.m. to 8 a.m., Monday through Friday.

A spokeswoman said HP promises a callback from a system engineer within two hours of the customer's call. On-site support within a specified maximum response time is also guaranteed, she said.

Customers who sign up for the service pay a start up fee of $250, which applies as a credit toward the first call if it is made within six months of the contract date. A variable fee is also charged for each call, the spokeswoman said.

Information is available from Inquiries Manager at HP, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

P-System Gets 'Spreadsheet'

BEAVERTON, Ore. — Payroll and spreadsheet software programs for the computer neophyte that run under the UCSD P-System operating system have been introduced by Timberline Systems, Inc.

The first in a series of seven packages to be available in 1983 — called the Medallion Collection — Spreadsheet is said to make such calculations as net present value, internal rate of return, linear regression, correlation coefficients, standard deviation and variance. All calculations are made in real-time.

Payroll — to be available in February — calculates all necessary payroll check information and payroll taxes, prints checks and check stubs, enters and maintains personnel payroll records and generates management reports for a firm with up to 500 employees.

Packages to come during 1983 include Accounts Receivable, Accounts Payable, Inventory, General Ledger and Custom Reporter. Spreadsheet costs $395; Payroll will cost $690 from the firm at 10550 S.W. Allen Blvd., Beaverton, Ore. 97005.

RPG-11 Preprocessor Out for System/34

FRESNO, Calif. — The Rocker Corp. has announced the RPG-II Preprocessor for the IBM System/34.

The software was designed to eliminate or minimize coding of file and input specifications in RPG-II programs, according to a vendor spokesman. It reportedly will free the programmer from having to describe the files and fields in every program.

The Preprocessor utilizes the Data Dictionary in which the programmer defines the files and associated fields, the vendor spokesman said. The software costs $150, including source code, from the firm through P.O. Box 12487, Fresno, Calif. 93779.

'Vue' Enhanced for DEC, HP Units

CUPERTINO, Calif. — National Information Systems, Inc. has released Version 3 of its Vue project management system for Digital Equipment Corp. Decsystem-10 and Decsystem-20, VAX-11 and PDP-11, and Hewlett-Packard Co. HP 3000 computers.

Among the new features of the software are hammocking and an exception resource report. New options are multiproject reporting and graphics capabilities. Vue will also be available on Perkin-Elmer Corp. and Honeywell, Inc. machines by next January.

Hammocking is said to consolidate a group of tasks into a higher level task and to provide a general view of the project. The exception resource report allows the user to set resource level upper and lower limits for each catagory and obtain a report showing all days when resources are outside those limits.

Version 3 costs $16,000. With the multiproject and graphics options, the software costs $23,500 from the firm at Suite 245, 20370 Town Center Lane, Cupertino, Calif. 95014.

Version 2 of 'Adasynch' Out

CAMBRIDGE, Mass. — Intermetrics, Inc. has released Version 2.0 of Adasynch, a Pascal program said to check the grammatical form of an Ada source program.

The new version conforms to the July 1982 draft proposed Ansi standard for Ada and runs on most computers that support Pascal. Adasynch provides a line-numbered listing of the original program errors and their locations. Version 2.0 attempts to continue processing while the error location is displayed. A cross-referencing program provides a summary of programmer-defined names showing where they appear in the source program.

The package, delivered in source form on magnetic tape, costs $900 from Intermetrics, Inc., 733 Concord Ave., Cambridge, Mass. 02138.

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Texprint Releases 'HCGS'

BURLINGTON, Mass. — Software said to provide a low-cost alternative for hard-copy generation of charts, diagrams, maps and other text/graphics data has been introduced by Texprint, Inc. for Tektronix, Inc. and California Computer Products, Inc. (Calcomp) machines.

Host Computer Graphics Software (HCGS) is said to bridge the gap between Tektronix, Calcomp and Digital Equipment Corp. graphics users by allowing software written using either Calcomp or Tektronix Plot-10/4014 calls to produce text and graphic hard copy on the Decplot LA-120 or other DEC dot-matrix printers/plotters.

Written in Fortran, HCGS is supplied in source form for DEC systems or any Ansi/Ascii-compatible system running Fortran. The price is $695 with 30-day delivery from 8 Blanchard Road, Burlington, Mass. 01803.

'Ease2' Out for DG MV Line

WESTBORO, Mass. — Data General Corp. has entered an agreement with Wessco to make Wessco's Ease2 structural analysis program available on DG's MV family of 32-bit minicomputers.

Ease2 is composed of seven modules for static or dynamic, linear finite element analysis of large structural models, a spokesman said. Basic structural analysis capabilities of the package include static analysis, eigenvalue extraction, transient response analysis, response spectrum analysis, random response and harmonic response.

Ease2 also includes a preprocessor that reads and checks the structural model data, a postprocessor that creates initial or deformed geometry plots and a postprocessor that plots structural output vs. time or creates special response curves from acceleration output, the spokesman said.

The package costs from $6,000 to $20,000 for the MV/8000, depending on configuration. For the MV/6000, the range is $4,000 to $12,000.

More details on the package are available from Wessco through P.O. Box 878, Elk Grove, Calif. 95624.

T/S Service Announced

WELLESLEY HILLS, Mass. — Datacrown, Inc. has announced the Alternative to In-House Computing, a computer time-sharing service.

Using high-speed terminals, clients can connect to Datacrown's IBM-based system through a continentwide telecommunications network. Datacrown manages the hardware, communications and systems operations. The client's in-house processing staff directs resources to meet the needs of their business, the vendor said.

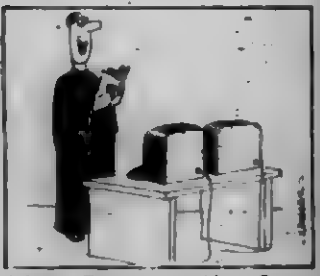
The service is billed on an as-used basis, Datacrown said from 20 William St., Wellesley Hills, Mass. 02181.

DDA System Enhanced

SUNNYVALE, Calif. — Data Design Associates (DDA) has announced a system enhancement for its Fixed Asset System said to incorporate changes mandated by the Tax Equity and Fiscal Responsibility Act of 1982.

The package, which runs on all processors supporting Ansi-Cobol, was designed to control depreciation expenses, provide tax information and manage corporate property. It also offers standard depreciation methods and shorter cost recovery as now allowed under federal tax law. The enhancement incorporates the new rules associated with investment tax credit (ITC) and recapture of ITC and depreciation.

Prices start at $17,000 from 1250 Oakmead Pkwy., Sunnyvale, Calif. 94086.



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Decision Support System

Micronotes

Visicorp has unveiled **Vision** (Operating Environment) for the IBM Personal Computer, software designed to enable users to work with a number of application products at one time.

The vendor described Vision as an applications environment designed to run on top of the underlying host operating system. It reportedly will support multiple application products, and the host layer provides the means of adapting the Vision environment to other processors and operating systems.

With Vision, applications are displayed on a screen that corresponds, visually and dynamically, to a business professional's desktop, the vendor explained. Each application appears on the screen as a window.

The user accesses one or multiple applications and transfers data between them, using a pointing device (mouse) to move the screen cursor. One window may show a current word processing draft, while a second may display related spreadsheet calculations. Users reportedly can view simultaneously the separate results of each application and combine them into a single document.

According to the vendor, users working on one application who wish to begin another move the mouse to the desired window, push the select button and open that window and its related application. To open new windows or close existing windows, users move the cursor to the appropriate command located on the command line at the bottom of the screen. Multiple windows can be sized and relocated on the screen using the Frame command, and data can be moved from one window to another using the mouse and the Transfer command.

The initial Vision offering will include spreadsheet, word processing, data base management and graphics applications and will be available this summer, the vendor said. Full details on pricing are not yet available, but a Visicorp spokeswoman said it will be comparable to the pricing on other Visi series software, which range from $100 to $400 per copy

Visicorp has also introduced **Visilink**, a software package that allows users of the spreadsheet program, Visicalc, to transfer data to their personal computer from Data Resources, Inc.'s data bank. It is designed to allow easy access to current worldwide economic and business information in a format for immediate Visicalc analysis. The product is available for Apple Computer, Inc. Apple II and II Plus personal computers with at least 48K bytes of memory and two disk drives. It is available for $250.

Visicorp is located at 2895 Zanker Road, San Jose, Calif. 95134.

Alpha Software Corp. has introduced the **Apple-IBM Connection**, a software package designed to allow information transfer between the Apple Computer, Inc. Apple II and the IBM Personal Computer. Among its advantages it is said to be able to transfer spreadsheet information running on the Apple to the IBM without rekeying. It is available for $195. More information is available from the vendor at Suite 400, 6 New England Executive Park, Burlington, Mass. 01803.

Gregg Corp. has introduced **Mainline**, a software program for the Apple II that is said to request and pass information from remote mainframe data bases to the microcomputer via telephone. It is designed to simplify the formatting and transfer of data. It is available for $495 from the vendor at 100 Fifth Ave., Waltham, Mass. 02181

Infostar, a data base management system that reportedly was designed for nonprogrammers was announced by Micropro International Corp. for use on any microcomputers running under Digital Research, Inc.'s CP/M operating system. Infostar is menu-driven and includes a cursor for data entry that enables the user to draw forms on the screen, the vendor explained. In addition, the software is designed to enable users to generate preformatted quick reports by selecting the data desired. Infostar also includes full report-writing capabilities.

Available immediately, the complete Infostar software system includes a user training guide with example data files and other reference documentation at a suggested retail price of $495, the vendor said from 33 San Pablo Ave., San Rafael, Calif. 94903.

An enhanced version of its **DB Master** data base file management software has been announced by Stoneware, Inc. for the IBM Personal Computer. The enhanced package was unveiled at the Comdex/Fall '82 show. At the same time the vendor announced that its **Video Tape Training Library** for Apple Computer, Inc.'s Apple II has been expanded to include the IBM Personal Computer.

The updated version of DB Master has a 3,000-char/record, whereas the Apple version permitted 1,200 char/record. The new version also makes a browse mode available so users can select specified fields for screen display from a series of data base records, the vendor noted.

DB Master for the IBM Personal Computer will be available on floppy disk during the first quarter of 1983. It is priced at $499 and requires an IBM Personal Computer with at least

(Continued on Page 48)

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Micronotes

(Continued from Page 47)

192K bytes of random-access memory and two 320K-byte double-sided disk drives. A printer is recommended, the vendor added.

Stoneware has also introduced **DB Master Stat Pak**, a statistical software package for Apple Computer, Inc. Apple II Plus systems, that reportedly allows users to analyze stored data in DB Master files using a broad variety of tests. This product is available for $99 from Stoneware, Inc., at 50 Belvedere St., San Rafael, Calif. 94901.

The **Business Graphics Analysis Pak** reportedly allows users of Radio Shack TRS-80 Model III desktop business computers to create graphs by selecting the desired type and size of chart and entering the data from the keyboard or from disk files. This product is available for $174.95 from Radio Shack at 1800 One Tandy Center, Fort Worth, Texas 76102.

Quic-N-Easi AG is a new applications generator and data base manager that was designed to help people with no computer background produce professional applications. This product operates on Digital Research, Inc. CP/M-based microcomputers and consists of two parts, the applications generator and the report generator. It is available for $295 from Standard Micro Systems, Inc., 136 Granite Hill Court, Langhorne, Pa. 19047.

Micro Applications Group has introduced **MAG/Base**, a product line that reportedly allows end users to create their own applications without any previous knowledge of programming. Available in three levels for beginners to advanced computer users, **MAG/Base1** costs $295, **MAG/Base2** is $495 and **MAG/Base3** is priced at $795. The vendor is based at Suite 205, 20201 Sherman Way, Canoga Park, Calif. 91306.

Exemplary Software, Inc. has announced **Rank Master**, a software product for Apple Computer, Inc. Apple II Plus users. The tool reportedly allows decision makers to consider qualitative factors in the decision-making process. Priced at $195, the software is available from the vendor at Suite 46, 725 Cowper St., Palo Alto, Calif. 94301.

A software system that reportedly permits any Digital Research, Inc. CP/M-based microcomputer to communicate with mainframe, minicomputer and microcomputer hosts, including systems from Prime Computer, Inc., was introduced by Infoservices, Inc.

Infocomm reportedly provides a conversational mode that converts the microprocessor to a dumb terminal for routine interactive processing on a Prime system. **Infohost** is another product that runs in conjunction with Infocomm and resides on a Prime system. This product oversees the file transfer between a Prime system and any microcomputer using Infocomm, according to the vendor. Infohost, bundled with five Infocomm licenses, costs $3,500. Infoservices, Inc. is located at Suite 22, 1728 Montreal Circle, Tucker, Ga. 30084.

EPS, Inc. has announced the release of the microcomputer version of its FCS-EPS decision support system, called **MicroFCS**. Now any models developed on personal business computers can also be run on minicomputers or mainframes with no change in syntax, the vendor said. The IBM Personal Computer version will reportedly run on the System/34 and also on IBM mainframes. The system is also available for the Apple Computer, Inc. Apple II and North Star Computer, Inc.'s Advantage. This product costs $2,000 from the vendor at One Industrial Drive, Windham, N.H. 03087.

Multiplan, Microsoft, Inc.'s electronic work sheet, is now available for users of the IBM Personal Computer. This product reportedly boasts the full capability of a planning and modeling software tool. It is priced at $250. Further information can be obtained from Microsoft at 10700 Northup, Bellevue, Wash. 98004.

A data conversion program called **Superdata Interchange** that allows data generated by one applications program to be used for other applications and vice versa was announced by Sorcim Corp. Priced at $50, the program is available from the vendor at 2310 Lundy Ave., San Jose, Calif. 95131.

New Era Technologies, Inc. has unveiled a networking package of applications software called **Microcomputer Information Support Tools (Mist)**. This product line reportedly enables users to construct their own "electronic information node." Mist 2 is designed to run on Digital Research, Inc. CP/M-based microcomputers and is priced at $1,500. Mist 16, the IBM Personal Computer version, is scheduled to be available in the first quarter of 1983 and will cost approximately $1,800. Further information can be obtained from the vendor at Suite 924, 2025 Eye St. N.W., Washington, D.C. 20006.

Altos Computer Systems, Inc. has announced a **Dibol compiler** that allows users of Digital Equipment Corp. Dibol-11 applications to move software to all Altos microcomputers.

At the same time, the company announced that applications running under Pick & Associates, Inc.'s Pick operating system can run on all Intel Corp. 8086-based Altos 16-bit microcomputers. Other operating systems that run on Altos systems include Digital Research, Inc.'s CP/M and MP/M, Phase One Systems, Inc.'s Oasis and Microsoft, Inc.'s Xenis/Unix and MS-DOS.

The Dibol compiler costs $2,500 from Altos at 2360 Bering Drive, San Jose, Calif. 95131.

Personal Systems Technology, Inc. has announced a software package for the IBM Personal Computer which the company claims turns a portion of random-access memory into an instant-access disk drive. The **Insta-drive** memory resident disk simulator allows up to 320K bytes of memory to be defined as a simulated disk drive, a spokesman said.

The package is compatible with the IBM PC-DOS command library. Files may be created, copied, deleted, edited and manipulated by existing programs without modification. Insta-drive operates under PC-DOS versions 1.0 and 1.1 and costs $49.95 from Fred Berry at 22957 La Cadena, Laguna Hills, Calif. 92653.

Dickens Data Systems, Inc. has announced the **Wall Street Plotter**, a financial plotting package for users of Apple Computer, Inc. computers running DOS 3.3.

The plotter is compatible with text files containing historical quotes captured from popular quote services by standard telecommunications packages, a spokesman said. The package costs $125 from Dickens at Suite A, 3050 Holcomb Bridge Road, Norcross, Ga. 30071

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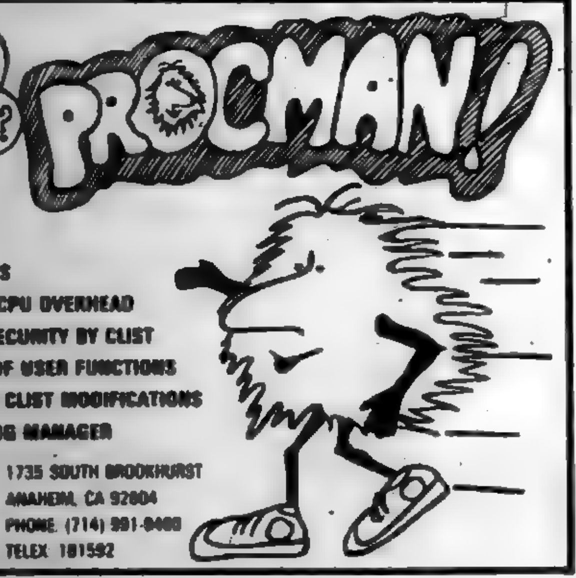
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Protocol Converter Allows Linkup Of Peripherals

AUSTIN, Texas — An interactive protocol converter said to allow the connection and operation of a wide variety of peripheral equipment, such as CRT terminals and line printers with IBM mainframes, is available from KMW Systems Corp.

The Series II 3270 emulates an IBM 3274 Systems Network Architecture or 3271 Binary Synchronous Communications controller. It also performs all required error-checking functions, translates the data to Ascii and outputs it in serial asynchronous or byte parallel format to and from user-attached devices, the vendor claimed.

Other 3270 features include transmission blocks up to 2,048 characters in length, selectable control unit address, separate internal buffer for each device and support for most consoles on the market. It is available in one-port through eight-port configurations and costs between $3,095 and $6,945, KMW Systems said from 8307 Highway 71 W., Austin, Texas 78735.

No Clear-Cut Winner In Local Nets, Says Report

By Bruce Hoard
CW Staff

SAN JOSE, Calif. — No single approach to local communications systems is dominating most sites, according to a recent report from Strategic, Inc.

In addition, *Impact of Broadband Local-Area Networks* predicted the market for local communications systems — including local-area networks, private branch exchanges (PBX), protocol converters and data switching systems — is on the verge of a "major shake-up."

The study is based on a survey of 50 large-site users of local communications systems. The study involved a large-scale program of interviewing multiple respondents at each site and covering a number of different functions and departments.

It maintained that different types of local communications systems are gaining footholds in different parts of user organizations, and the same organization may be installing several types of local-area networks, front-end or data switching systems, protocol converters and one of the newer PBXs.

The survey results also indicate that a high proportion of sites are moving toward integration under the umbrella of higher level software systems. It claims that the question of whether to go with baseband or broadband systems has been answered by most users.

"The key to large-site competition will not be so much a particular solution as the ability to provide software that enables these solutions to function as components of a broader system," according to Strategic.

The big mainframe manufacturers will be the main force in this market and IBM will "clearly" be out front, Strategic maintained. IBM will offer all the necessary components, let users configure them as they will and then tie them all together under Systems Network Architecture.

The study also showed major implications for AT&T and the Bell operating companies. "We have to bear in mind that the picture we have been describing will happen in the 3,000 or so large-site users in this country," Strategic stated. "Those are also, of course, sites that represent a large chunk of AT&T business."

It predicted that AT&T and the Bell operating companies are aiming to move more into the large-site data communications business, but will meet a lot of competition getting into the voice business for the first time.

The successful competitors will be those who have a variety of compatible solutions for both voice and data traffic and if AT&T and the Bell operating com-

(Continued on Page 52)

'Observer' Runs on PDP-11

Package Monitors Decnet Status

MAYNARD, Mass. — Digital Equipment Corp. has announced a software package that reportedly monitors the operational status of all nodes and lines in a Decnet network and collects performance and usage information.

Called Observer, the software runs on PDP-11 processors running either RSX-11M or RSX-11M-Plus operating systems and Decnet software.

The package reportedly includes a report generation facility that processes collected data and produces reports summarizing node- and link-level traffic, error rates and availability.

Using a terminal on the node running Observer, a network manager can call up on-line, real-time displays of the status of any node or line in the network, a spokesman said, as well as statistics on traffic loads and transmission errors.

The package is priced at $15,000 from DEC, Maynard, Mass. 01754.

Bitelex Workstation Unveiled

ELMSFORD, N.Y. — A dual-language microprocessor-based communications workstation has been introduced by the International Digital Electronics Association (Idea).

The Bitelex workstation is designed to communicate over international and domestic networks such as TWX, direct distance dialing and Telex. It is described as being a multiport concurrent device.

The workstation reportedly has bilingual capabilities that allow it to display, transmit and print in any two languages. In addition to the English-only version, an Arabic/English option is available.

The basic unit consists of a 12-in. green or white phosphor display, full Ascii keyboard, 80 char./sec impact printer, single-board control unit with 64K bytes of random-access memory and 16K bytes of programmable read-only memory, two serial communications ports with built-in modems, a parallel interface port and a multitasking central program.

The workstation prices start at $3,500 and it is available from Idea, 6 Westchester Plaza, Elmsford, N.Y. 10523.

Satellite Unit Has Multihop Transmission

WESTLAKE VILLAGE, Calif. — Bunker Ramo Electronic Systems has introduced a satellite data system said to be capable of high-speed multihop satellite transmission of computer data. It features full-duplex data flow, optional computer control, self diagnosis and troubleshooting.

The BR 1720 Satellite Data System was designed for the banking, finance, insurance and retail industries and major industrial concerns. It transfers digital error-free data between computers and/or tape drives over satellite or terrestial media at speeds up to 6.3M bit/sec.

The starting price for a single BR 1720 system is $96,500 from Bunker, 31717 La Tienda Drive, Box 5009, Westlake Village, Calif. 91359.

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CRT Unit Emulates VT132

SUNNYVALE, Calif. — Falco Data Products, Inc. has introduced a CRT terminal that reportedly emulates the Digital Equipment Corp. VT132 and features 80- and 132-col. formats.

The TS-132 also offers advanced video, block mode, local-printer port and 14 programmable function keys, the vendor claimed. Programs written for the DEC machine can be directly transported without modification and the keyboard can be used by a VT131- or VT100-trained operator.

Local storage is said to be increased by efficient memory management that converts unused horizontal area into additional vertical storage. The terminal also features two RS-232-C ports,including a 128-char. set to produce business graphics.

The terminal is available for $1,650 from Falco Data Products, 1286 Lawrence Station Road, Sunnyvale, Calif. 94086.

Works With Ascii Terminals

Tri-Data Unveils Modem

MOUNTAIN VIEW, Calif. — An asynchronous Bell 212-compatible modem has been announced by Tri-Data Corp.

The OZ 225 Network Modem reportedly can be installed with any asynchronous, Ascii terminal that provides an RS-232 connection as well as those connected to a host computer or a network processor, the spokesman for the vendor said.

Telephone connection can be originated from either the terminal's keyboard or automatically from the phone number directory of the OZ 225, the vendor spokesman said.

The unit also has directories for logon information, logon response verification and number dialing restrictions with a total directory storage of up to 2,000 characters, the spokesman said. A call can be retried up to 15 times at preestablished intervals or can be linked to another directory entry for alternated number dialing. Once connection has been established, the OZ 225 can automatically logon and verify the logon response, the vendor spokesman said.

The OZ 225 is available for $1,490 from the vendor at 505 E. Middlefield Road, Mountain View, Calif. 94043.

Solid State Unveils PBX

ATLANTA — Solid State Systems, Inc. has introduced a computerized private branch exchange (PBX).

The Communications and Energy Optimizer has expanded capacity up to 1,800 stations and up to 384 trunks. Solid State's "one unit" design combines automatic call distribution with the branch exchange so there is no need for anciliary devices.

The increased computer power reportedly allows the system to generate detailed reports on traffic, system usage and time data. The optimizer comes with station message detail recording and automatic route selection/Least Cost Routing capability.

The branch exchange is available at approximately $400/line installed.

Solid State Systems is located at 1990 Delk Industrial Blvd., Marietta, Ga. 30067.

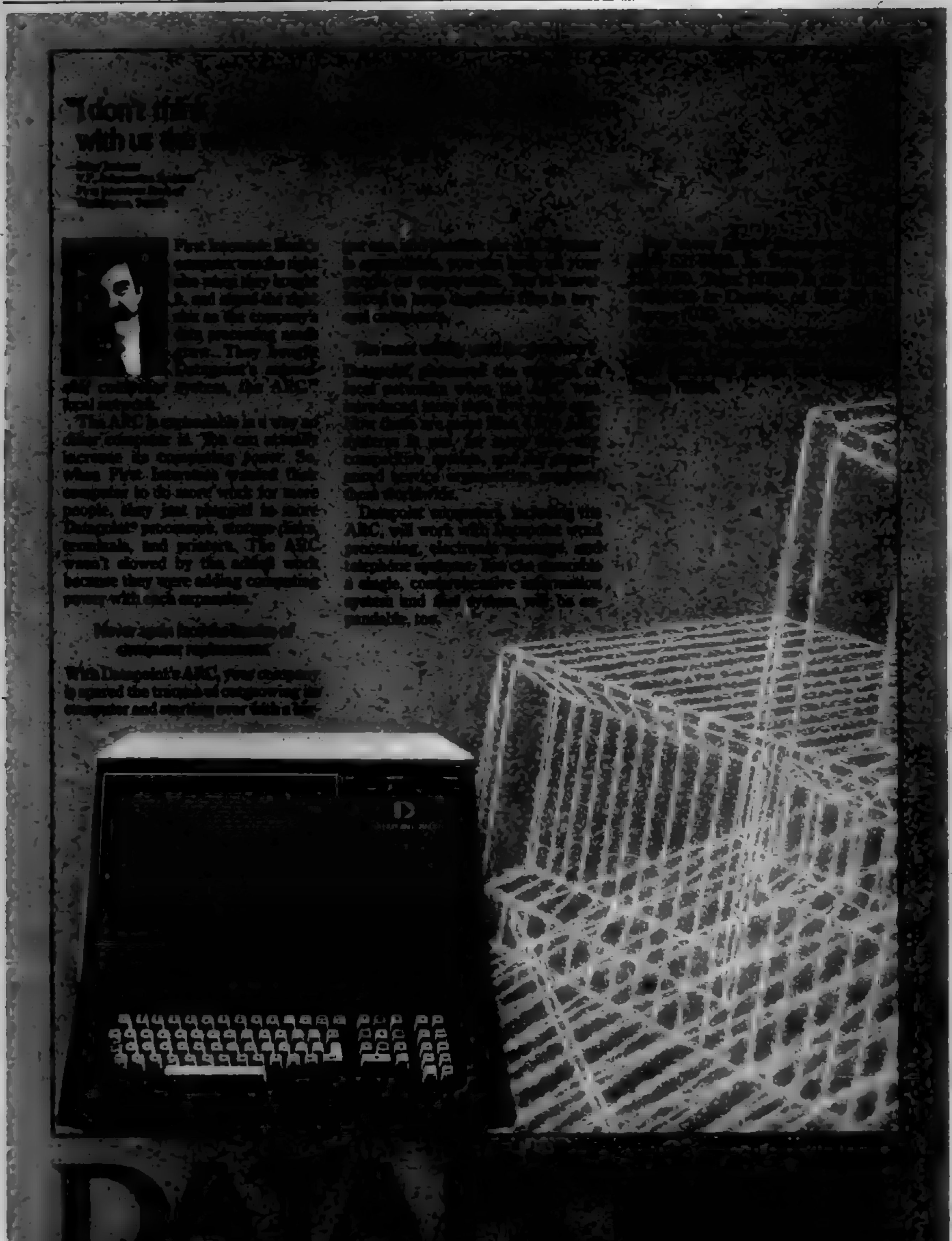
Cluster Unit Fits 3270 Net

SCOTTSDALE, Ariz. — Phaze Information Machines Corp. has introduced an IBM-compatible cluster display station that operates in an IBM 3270 network.

The Model P3278 Information Display Station can be used with IBM 370, 8100 and 4300 series computers and their plug-compatible equivalents, the vendor claimed. It is a replacement for the IBM 3278-2 Display Station and attached to a wide variety of IBM terminal controllers through the IBM 3278 coaxial protocol.

The display station is a three-piece modular architecture that includes separate terminal display, keyboard and logic modules. It features a 12-in., green-phosphor display.

The Model P3278 is available for $1,995 from the vendor at 7650 E. Redfield, Scottsdale, Ariz. 85260.



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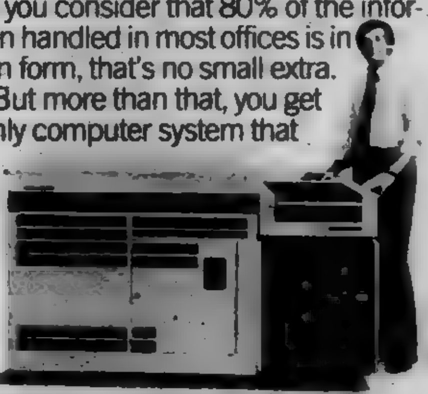
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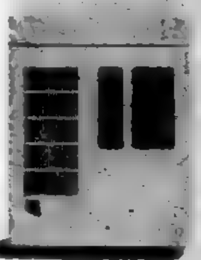
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Ansi-Compatible Terminal Can Be Tailored by User

MINNEAPOLIS — A user-configurable, Ansi-compatible editing CRT terminal has been introduced by Teleray Division of Research, Inc. The terminal can be tailored to emulate almost any asynchronous terminal or be compatible with almost any asynchronous computer or operating system, a vendor spokesman said.

The Model 7 will accept up to 32 variable-length dynamic functions. Sixty-eight selectable operating parameters are retained in nonvolatile memory, even when the power is turned off.

Among its other standard features, the Model 7 has two fully buffered bidirectional RS-232 ports, musical operator alerts and a screen-saver feature. It is available with a 9-, 12- or 15-in. CRT screen and white, green or amber phosphor.

The price of the Model 7 is approximately $1,295 depending on the design. More information is available from Teleray, Box 24064, Minneapolis, Minn. 55424.

Codex 8150 Out For Local Nets

MANSFIELD, Mass. — Codex Corp. has announced the 8150 local distribution service unit for intra-complex communications.

The unit can operate over distances of up to 23 miles at up to 19.2 bit/sec. The 8150 includes local and remote unattended diagnostic testing and an asynchronous test pattern. The unit is available in both stand-alone or card versions. For high-density applications, a nest enclosure is available to house up to 16 cards, the vendor said.

The 8150 can be used in point-to-point or multipoint operations and accommodates tail circuit applications off long-haul modems or those involving Codex multiplexers and switches, the vendor said.

The 8150 costs $335 from Codex at 20 Cabot Blvd., Mansfield, Mass. 02048.

CRT Terminal Offers Colors

HAUPPAUGE, N.Y. — Applied Digital Data Systems, Inc. has announced a general-purpose color CRT terminal that offers eight colors: red, green, blue, magenta, cyan, yellow, black and white.

The Viewpoint/Color CRT also provides the ability to create business graphics and displays 80 characters in 25 rows including a status line. A set-up mode allows the user to apply color while the form is on the screen, so that the user can evaluate the color changes, a vendor spokesman said.

The terminal costs $1,095, the vendor said, and is available from Applied Digital Data Systems, which is located at 100 Marcus Blvd., Hauppauge, N.Y. 11788.

No Leader Seen In Local Nets

(Continued from Page 49)

panies stay with just a PBX/twisted pair approach, they will lose out," the study claimed.

In many sites, distribution will be a determining factor in vendor selection, the study claimed, adding "very few vendors have the ability to provide the depth of support at the moment." The study costs $20,000 and includes two copies of the three-volume study and a private briefing, Strategic said. The firm can be reached through P.O. Box 9747, San Jose, Calif. 95157.

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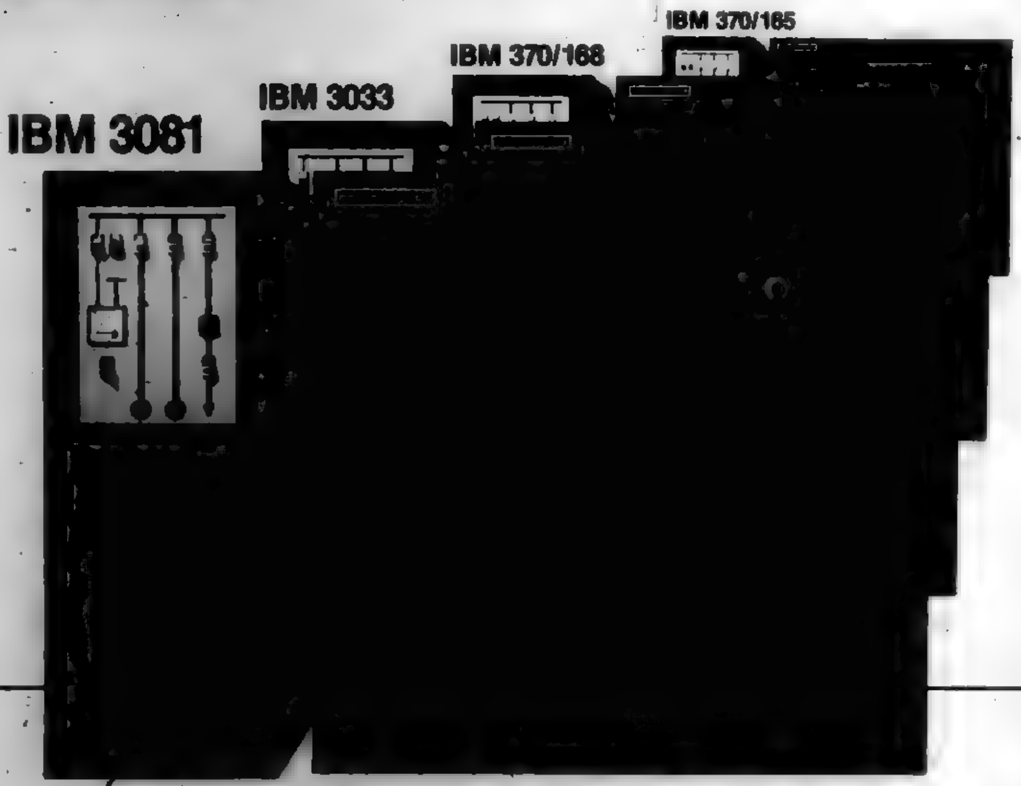

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IN DEPTH

POLITICS AND SYSTEM JUSTIFICATION

A Guide to the Political Forces in a Corporate Setting And How Systems Personnel Can Steer Them to Advantage

By Richard K. Lindgren

Systems development personnel almost universally disdain political influences in the work place. In the course of design and implementation, they often regard instances of office politics as deviations to be "systematized" along with the more formal processes of the business. Systems developers also come up against political forces in the financial justification process. The financial powers-that-be may not evaluate the costs, benefits and spending priorities in the same systematic way the rest of the project was analyzed. The ever-logical systems analyst often winds up frustrated and outclassed by decision makers who have a better understanding of the real power structures at work. Political decisions, in the sense used here, are aimed at managing a diversity of people, goals and special interests. In complex corporate structures, there is often no clear, single utility to be maximized in setting goals. Economic rationality, while still the primary guiding force in profit-making organizations, is tempered by social considerations, cultural

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norms and personal values. Like a pluralistic government, the organization must satisfy these considerations to some extent to maintain unity and direction.

Peter Keen and Michael S. Scott Morton, in their book *Decision Support Systems*, note that decision making takes on more of a pluralistic tone at higher levels of the organization. The lower ranks are more subject to the rigidity of "standard operating procedure." The bigger the project, the more likely it will be evaluated by higher levels of management, and thus from a more pluralistic perspective, taking into consideration factors other than economic benefit.

The frustration of systems development personnel with political decision making can best be understood in the light of their talents. Success at the entry level of their profession depends almost entirely on logical thinking. Many companies require only a minimum of technical knowledge for entry-level jobs, testing applicants instead for aptitude in logic and providing them with customized, in-house training.

The next requirement for continued advancement in the computer field is the ability to assimilate and apply technical knowledge. Political skills are not essential to moving ahead until one reaches the management level (although they often help deter problems in systems planning and implementation at lower levels). The systems development manager may be ill-prepared to move from a homogeneous, largely nonpolitical atmosphere to the company of other functional managers who have succeeded largely because of their political skills.

To those attracted to data processing, computers are the ultimate rational adversary; DPers succeed by channeling that logic to useful ends. For them, structuring organizational processes into systems is the name of the game, but it is the antithesis of the political processes that influence decision making in much of the rest of the firm.

In many other areas of the firm, and in higher levels of the systems organization, there is often not as much intrinsic satisfaction with the object of labor. People with talents in nontechnical areas find satisfaction in effective interaction with a diversity of people. They see economic rationality as a second, often nonevident motivation; pluralistic decision processes are seen in their most positive sense as the dominant reality.

Systems developers are often out of their element when confronted with such a decision environment.

Political Processes

The decision processes usually called "political" are focused on channeling and controlling the pluralism of the corporate environment, as opposed to the "ideal" of economic rationality or the arbitrary prescriptions of "standard operating procedure." The most common of these political processes are

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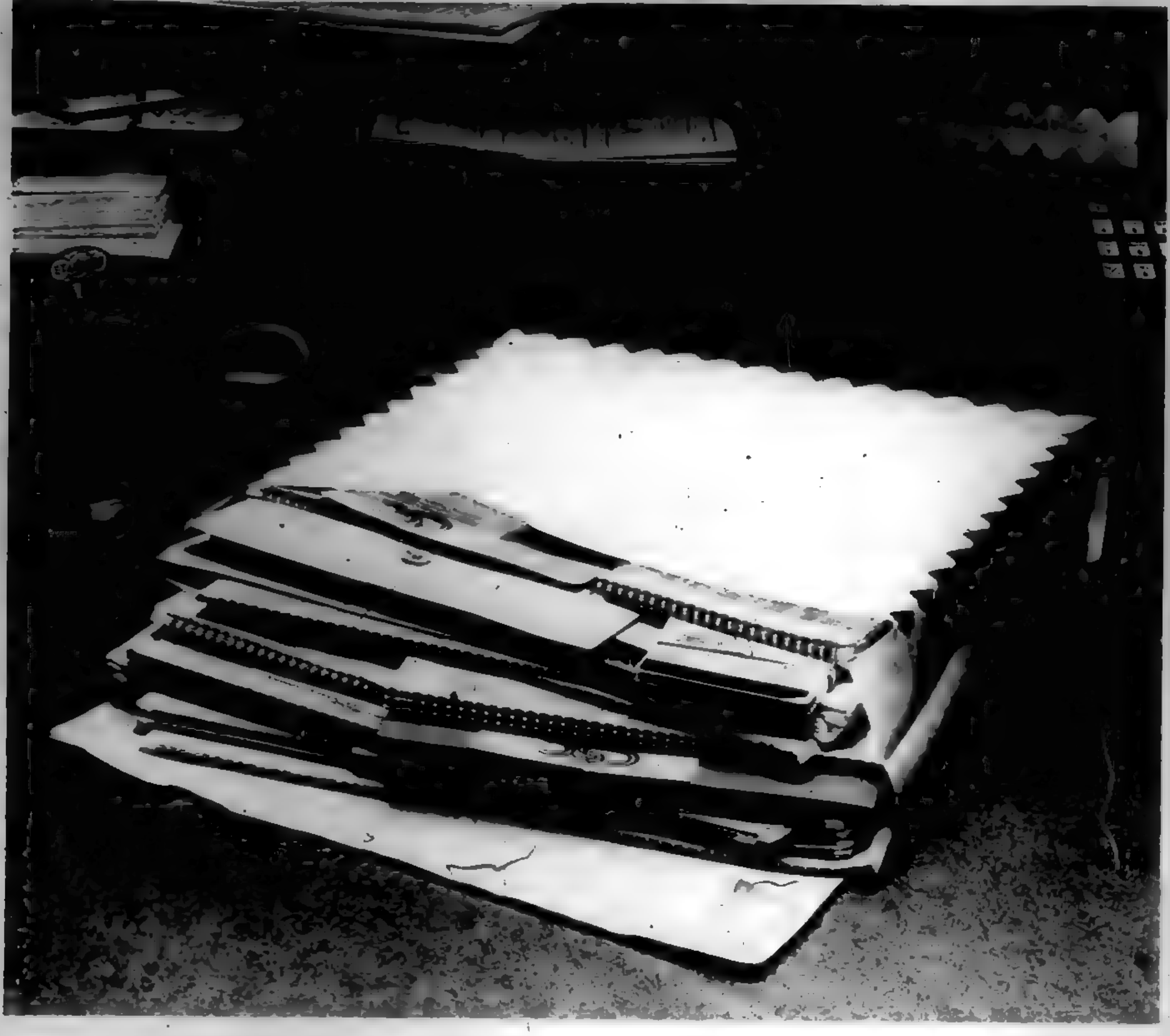

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advocacy, negotiation, consensus and coalition-building. The lines between some of these are difficult to define, but they all have both advantages and drawbacks.

Advocacy is the basis for all other aspects of political decision making. Pluralism demands that all those who wish to gain the support of a diverse group must be prepared to press their case thoroughly, clearly and continually in both formal and informal forums. The belief that the "numbers speak for themselves" frequently leads system planners down to defeat. "Lobbying" is very close to advocacy in concept, although this term has more negative connotations.

Effective and appropriate advocacy is required whenever systems development personnel foray into "hostile" territory for system design, implementation and funding. The system with "obvious" economic or technical merit often fails because the developers fail to be their own advocates, to enlist the support of user groups and to support those groups in some of their own noncomputer-related issues.

Negotiation is the process of bringing the conflicting advocates closer together. In its positive sense, it involves give-and-take bargaining in which all parties involved prioritize the various components of their advocated positions. In order to reach a common end, the parties are prepared to modify their positions. In a negative sense, negotiation involves overstating demands in the hope of emerging with expected needs fulfilled. "Brinksmanship" is a second negative feature; those who are willing to hold out as long as possible are able to beat the competition.

Information systems developers often fail in the negotiation process not only because they are generally not of a mind to negotiate, but also because their typical project proposal lacks flexibility. On one extreme of inflexibility is the proposal that seeks to accomplish the minimum job for the minimum cost. Funding tends to be easier to get for a small project, and once it is approved, the desired "add-ons" can be justified on a smaller, marginal basis. The initial project, however, can only be accepted or rejected as a total package, because of its limitation to the minimal requirements.

The other extreme of inflexible proposal "shoots for

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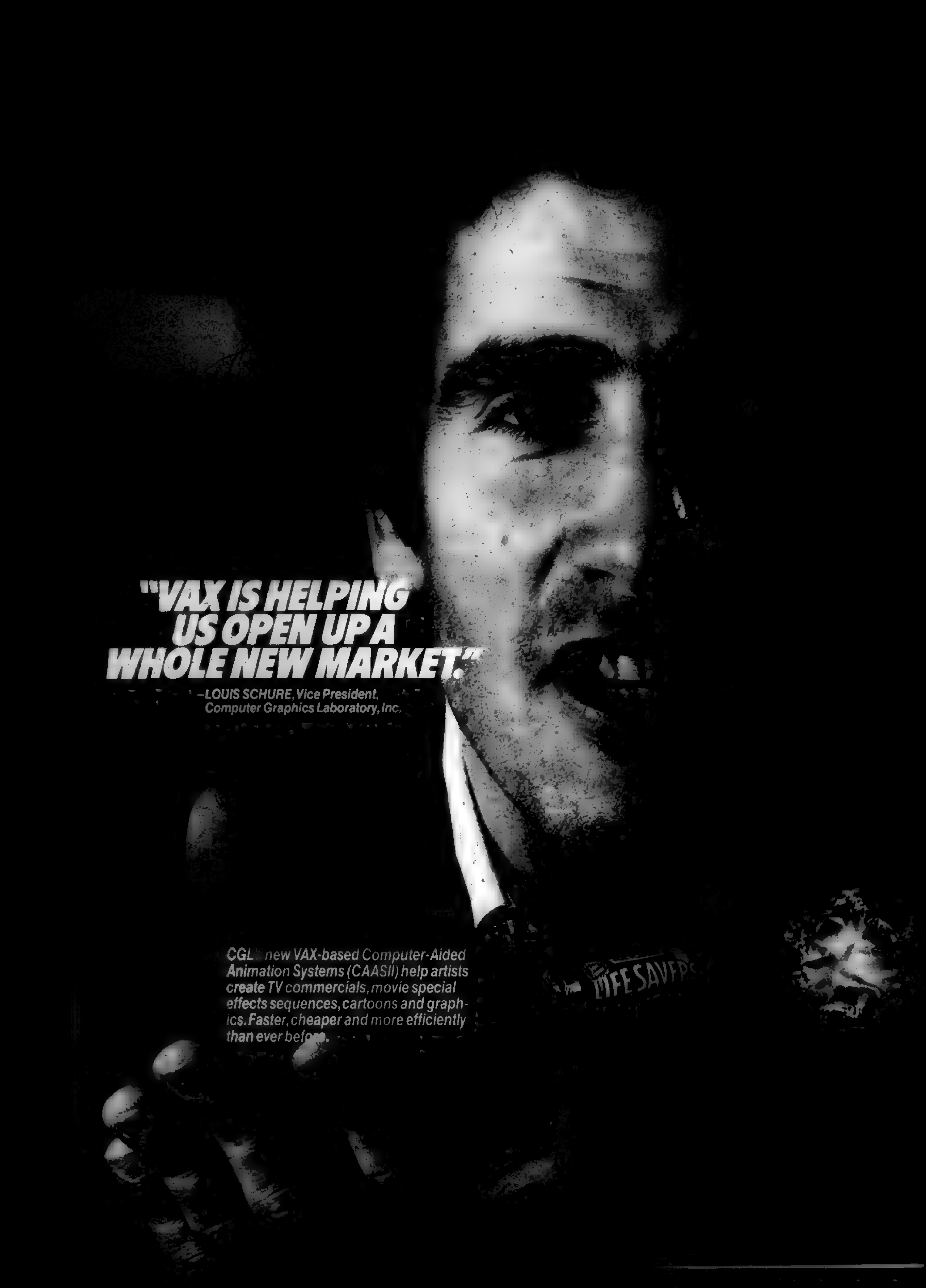

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the moon" in terms of facilities to be acquired and information to be provided — without a breakdown into negotiable modules and without separate analyses of the alternative marginal costs and benefits. The common strategy here is the hope that the noncomputer-literate parties involved in the justification process will not understand the options and that the whole proposal will be approved intact if the people with the purse are in a spending mood.

As J. Emery notes in *Systems Analysis Techniques*, the optimum system does not supply all useful information, since some information costs more than it is worth. In an application of microeconomic theory, he instead suggests that information to be provided be analyzed on a marginal-cost vs. marginal-benefit basis. The system should optimally handle information up to the point where the incremental hardware or software costs exceed the incremental worth of the information.

As the debate often centers around the value of those incremental benefits, a political modification to this view suggests that the project should be presented as a series of incremental possibilities, where additional benefits can be demonstrated by the additional hardware, software and personnel options. The value of the incremental information may be debatable and difficult to quantify, but a well-defined step function for costs can be an important tool in arriving at a negotiable range of expenditures. Understanding the negotiable range is key to justifying systems in this environment.

Consensus is the most positive outcome from negotiation, where all parties are able to speak as one in terms of organizational direction. In order for consensus to exist in information systems development, the computer specialists must take an active role in negotiating that agreement, not only in systems matters, but in all related aspects of the organization's function.

Even in organizations where "standard operating procedure" dominates the lower level decision processes, goal setting at the highest levels tends to remain much less structured and much more of a consensus-type process. It is often easier, then, to precede a major systems project, which must pass through formal justification procedures, with a cultivated agreement in principle among the powers-that-be. The proposed system can often be more easily "pulled" through channels where consensus already exists than "pushed" through opposition by the weight of its economic benefits.

In those organizations where consensus can not be reached, work usually goes on with a series of temporary and informal alliances of enough accumulated power to govern various aspects of the business. ***Coalition-building*** is the most delicate of political processes, requiring tact, flexibility and a broad view of the organization's needs. However, coalitions often involve mutual backscratching and face-saving. Again, systems developers fail in political matters by default if they refuse to seek out and lead coalitions. They abdicate their role in determining information systems direction.

Other Pluralistic Factors

The facets of political decision making are many. Indeed, a somewhat facetious definition of a political decision might be "any decision that is contrary to my special interests." Several other common behaviors can be seen as having pluralistic traits as they apply to information systems development.

Expediency is the extreme variant of consensus in which the group allows a single decision maker to handle relatively minor issues himself, to dispose of them as quickly as possible. Particularly urgent or embarrassing systems issues are often handled this way. For instance, "crash" allocations of manpower and other resources, with little analysis, are common for locating and correcting critical program bugs.

A variation of negotiation common to systems projects is the use of *riders* to secure additional hardware or personnel via a project that is only marginally related. When disk storage capacity is reached, for example, the purchase price of an additional

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disk drive might be melded in with some major systems project, even though the project does not consume much of the additional capacity. While riders can significantly distort the best economic analysis models, they are commonly used to avoid scrutiny and obtain funds in a constrained fiscal atmosphere.

> ***'Active participation by lower level management in meaningful decision making can encourage systems innovation by putting the power to change a process closer to where that process is performed.'***

Various techniques can be used to facilitate group decision making. Where no clear consensus exists, conflict resolution techniques are helpful in clarifying issues, assumptions and perceived facts, separating them from purely rhetorical statements. All of these techniques can be applied in the systems justification process, especially when the group cannot agree on a system's economic benefits.

In pluralistic organizations, abrupt changes in tasks are rare and resisted. M.W. Taylor, in his book *A Computer Simulation of Innovative Decision-Making in Organizations*, has modeled the organization as the sum of the many individual decisions, each of which may be handled in one of two ways:

1. By continuing with the status quo.
2. By changing the decision process (innovating).

This model views innovation as a function of several conditions that act upon the decision maker, who makes rational choices within certain bounds, as described by H.A. Simon in *Administrative Behavior*. Several environmental conditions can be viewed in light of how they encourage or discourage innovation. Since innovation is the essence of computerization, these conditions will determine a project's fate — support or resistance.

Dissatisfaction With Status Quo

Unless the decision maker is substantially dissatisfied with the current decision process, there is no motivation to change, so it is difficult for any outside force to alter that process. A system backed by higher management, which sees the project as an economic necessity, may meet resistance from the user, who sees no need for change. Justification from a political viewpoint demands that all involved recognize the need for change.

In the realm of individual differences, some people find job satisfaction in risky ventures, while others are happier if they can avoid taking unnecessary chances. Some firms are historically risk-averse and therefore attract, over the long run, risk-averse personnel. Here the compatibility of the systems developers with the firm's risk position and their sensitivity toward attitudes in the other

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functional areas are essential to winning financial justification.

By nature and training, computer-oriented personnel are more comfortable with innovation, especially in their own areas, than is much of the rest of the firm. Since high-risk projects are likely to face opposition in a low-risk environment despite economic merit, systems personnel must often structure their projects in increments, with early stages of a lower risk, in order to win approval.

> *'Corporate innovation cannot be forced by economic rationality alone. A broader view of the decision-making processes is essential.'*

People are naturally reluctant to change when they have spent a good deal of time or money to get where they are. Systems developers themselves are not immune to the temptation to throw good money after bad and are reluctant to drastically revise an existing system. This attitude also discourages spending on adequate feasibility studies for new applications out of fear the money will be "wasted" if the project is deemed infeasible. The best way to overcome this hurdle is to carefully document the costs of the status quo versus the benefits of the change.

Other factors that affect innovation, although less, include the amount of free or unobligated resources available and the degree to which power is decentralized. The former encourages innovation in systems matters when users have access to computer services without charges to their budgets. This may be counterproductive, however, if the user group does not feel the need to take responsibility for the system's functioning. Also, the system's true costs are often not reflected where the services are subsidized, so the resources may not be used most effectively.

Active participation by lower level management in meaningful decision making can also encourage systems innovation by putting the power to change a process closer to where the process is performed. Although some type of high-level coordination is required in systems matters, the user groups should be the primary source of system ideas and design and should have the computer expertise as close to that process as possible.

The complexity of the modern American corporation prevents any "pure" evaluation of system costs and benefits. To ignore the components of political decision making is to endanger an economically sound project proposal.

Corporate innovation cannot be forced by economic rationality alone. Systems that effect change in corporate processes must also address the pluralistic needs of users and managers. A broader view of the decision-making processes, then, is essential for success in the otherwise-rational world of computerization.

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About the Author

Richard K. Lindgren is a certified public accountant and assistant professor of business at Graceland College, Lamoni, Iowa.

Lindgren's articles on finance and computer applications have appeared in Data Management *and* Computer Graphics World. *He holds an MBA from the University of Michigan.*

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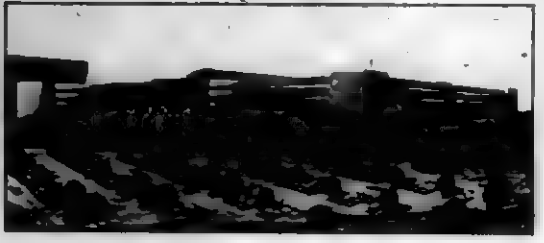

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IN DEPTH

USABILITY: Toward a Science of User Documentation

By Edmond H. Weiss

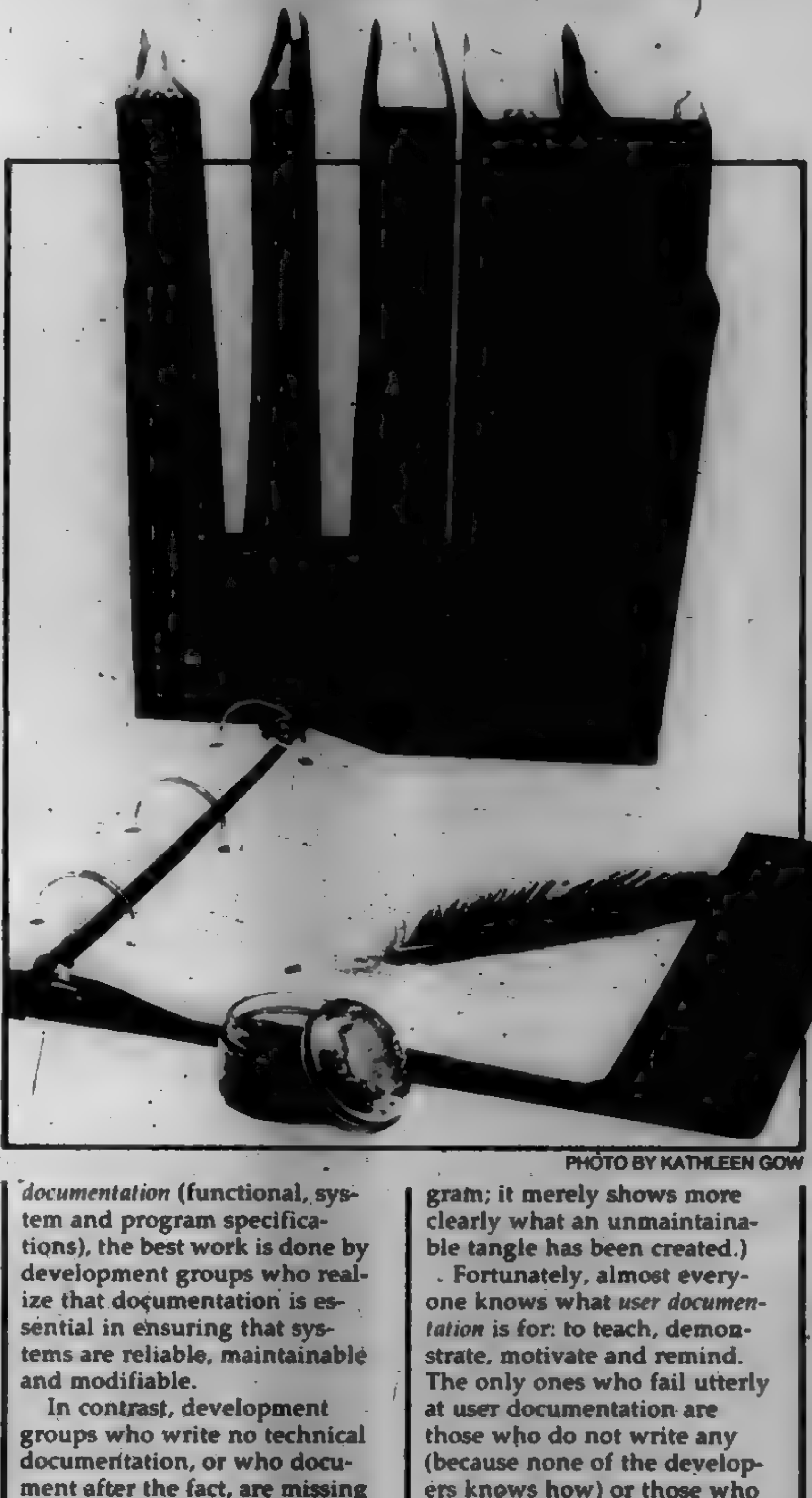

PHOTO BY KATHLEEN GOW

Usability has become a catchword, a slogan to rally the enthusiasm of tired computer people. Just as "idiot-proof" gave way to the more congenial "user-friendly," user-friendly is yielding to "usable": the extent to which a system, program or gadget is easy to use.

The key to usability, of course, is user documentation, today broadly defined to include not only the traditional user manuals and operator guides, but also a cornucopia of books, brochures, audiovisual packages, reference placemats and fanfold quick-reference cards. However, the emerging favorite medium for user documentation is a series of screens integrated within the system or device itself.

Contrary to what some technical writers believe, clear and correct documentation cannot make a messy system neat or an awkward procedure graceful. (In fact, clear documentation frequently shows us brilliantly what a messy system we have invented.) But to realize maximum usability for a system, the documentation itself must be free of structural and linguistic flaws.

The firms that write the best documentation are those that know its purpose. In *technical documentation* (functional, system and program specifications), the best work is done by development groups who realize that documentation is essential in ensuring that systems are reliable, maintainable and modifiable.

In contrast, development groups who write no technical documentation, or who document after the fact, are missing the point. A system developed without a nested series of increasingly fine specifications — each tested before the next design step begins — is probably a bad system. (Documenting a program after it has been written hardly affects the maintainability of the program; it merely shows more clearly what an unmaintainable tangle has been created.)

Fortunately, almost everyone knows what *user documentation* is for: to teach, demonstrate, motivate and remind. The only ones who fail utterly at user documentation are those who do not write any (because none of the developers knows how) or those who believe, mistakenly, that what users want is facts about the system. For the most part, users are *not* centrally interested in facts — except as they relate to tasks, procedures, transactions or the pursuit of objectives.

The most useful way to regard user documentation is to think of each manual (or videocassette or series of screens) as an instrument or device that is supposed to *control the reader*. In other words, manuals are programs for users. The analogy is inescapable: manuals and documents do for (and to) users what software does for hardware. Effective manuals not only pass data to the readers, but also drive and control their actions and, in the process, enable them to perform their tasks and do work that needs or wants to be done.

It follows, then, that what is good for a program is good for a user manual. All the design weaknesses and bugs that stop a program from running can stop a document from being usable: logic errors, missing or inconsistent items, ambiguity, tangled structures, faulty syntax, operations that exceed the capacity or abilities of the system (or reader).

Again, the analogy is clear. Although a user, unlike a machine, will sometimes "interpret away" an error of logic or impute a missing fact, most readers are generally as passive and dependent as electronic circuitry. And today's typical user — with limited

technical background and meager reading skills — is unable to "run" when there are mistakes and bugs in the documentation.

Flaws and Failures

In many ways, the most important similarity between documents and programs is linearity. Reading (like watching and listening) is linear: one thing after another.

In user documentation, a flaw is any interruption of this normal, linear flow of reading. Any such interruption burdens the reader, lowering the book's usability and increasing the chances of a failure: a user stymied by the documentation and unable to function.

A well-designed manual should allow the reader to find an appropriate starting point in the document and, to the extent possible, continue to move forward, phrase by paragraph by page, until his need for information is satisfied. Every time the reader changes direction, whether to go from the back of the book to the front or to reread an unclear sentence, the document's usability declines.

Of course, it is inevitable that in most manuals the reader will have to skip, jump, detour and change directions. Nevertheless, every branch, loop and reversal makes the book harder to follow and diminishes its effective control over the reader.

Often, of course, these detours are deliberate. For example, an operator's guide, in explaining how to fill in a certain screen, will send the reader to a table of occupation codes 100 pages away, from which the operator will be expected to find his way back to the original discussion. But deliberate or not, inevitable or not, the detour reduces usability. In fact, every time a reader skips pages, usability declines slightly.

More often, though, these flaws are accidental or unintended, as when the same operator's guide neglects to tell the reader where the table of occupation codes is located, forcing the operator to search for it.

Generally, these documentation flaws (losses of linearity) fit three categories, depending on the kind of errors that caused them:

1. Strategic errors, which produce the largest problems, are misalignments of the documents with the users, so that the reader is seeing the wrong book. Typically, strategic flaws compel the reader to skip over huge, irrelevant sections to find what he needs; jump from one volume to another in search of missing material; search in vain for missing items that are not in any manual or file accessible to the user; or refer frequently to glossaries and dictionaries, because the manual uses language unfamiliar to the reader.

Almost every attempt to package all user and operator information into a single, encyclopedic guide will generate several of these strategic problems. Conversely, when there is a proliferation of user materials, many users will need more than one document and the probability of "volume jumping" increases.

2. Structural errors are flaws in the organization and sequence of individual books and manuals. That is, while it is one thing to make sure that a user has the right book (free from these strategic errors), it is another, more difficult thing to ensure that the user can get what he needs without frustrating false starts, big loops and wild goose chases.

Typically, structural flaws compel the reader to read sections in the manual in a sequence other than the one in the book; struggle with difficult preliminaries before getting under way; search for tables and exhibits referred to in the text and try to read two widely separated pages at the same time; fight through long, discursive passages in search of a single, small fact; or reread passages several times, because necessary background or preliminary material has been "assumed."

Structural flaws can be blamed on bad design techniques — specifically, the traditional, vague method of outlining and "specifying" a book.

3. Tactical errors result from poor or incompetent editing. Though on a smaller scale than the other flaws, these also have the effect of sending the reader hunting, sometimes within a given page or paragraph.

Typically, tactical flaws compel

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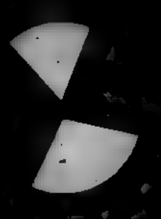
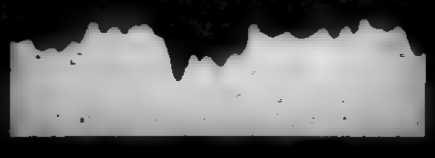


Pie Chart of Revenue

Plot of Funds*Year

Telephone Expenditures



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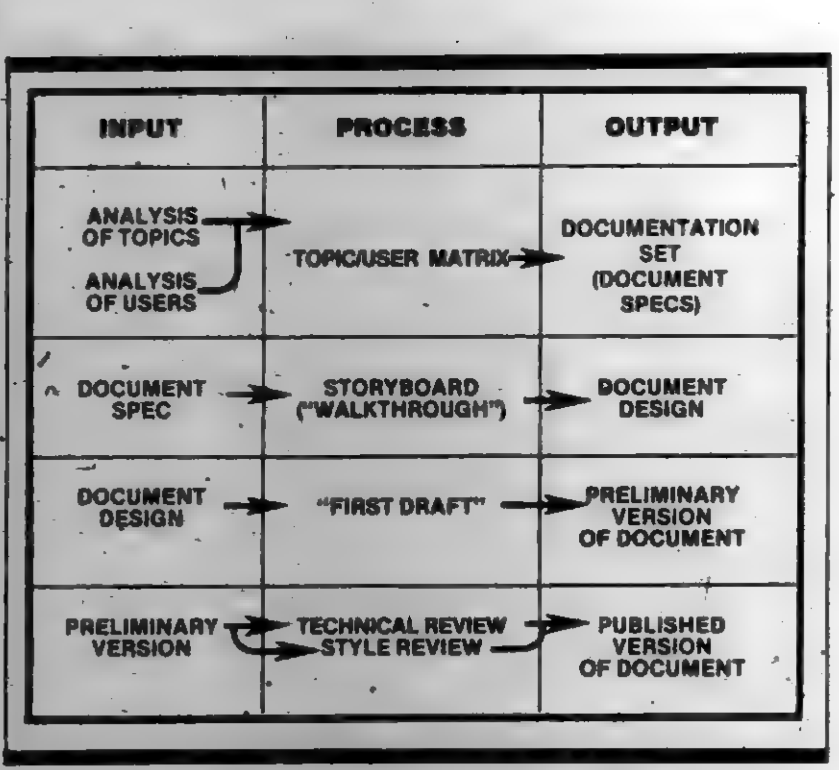


Figure 1. The Structured Documentation Scheme

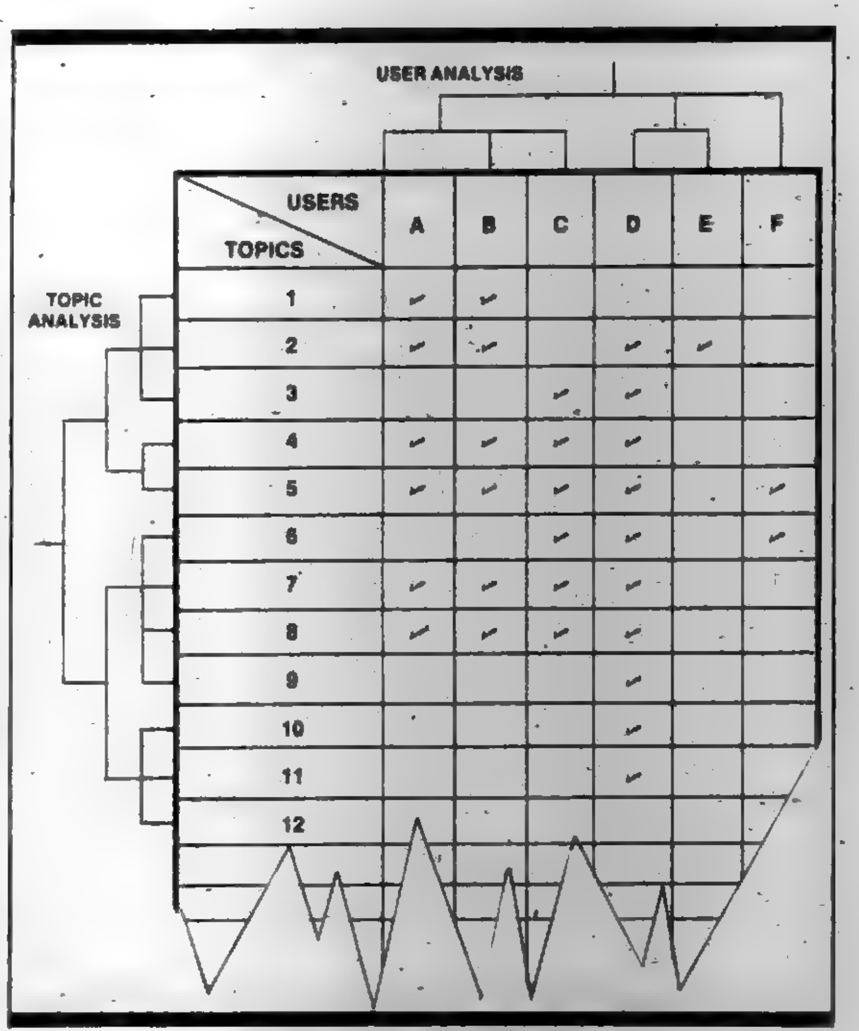
readers to search for the meaning of unexplained acronyms and abbreviations; struggle with inconsistent nomenclature; reread unnecessarily difficult, tangled, ambiguous sentences and passages; or strain to relate the materials in the text to the materials in the tables or diagrams.

All first drafts are filled with tactical errors, and all tactical errors create a need to reread or loop. A badly edited instruction (for example, then-if instead of if-then) can baffle the operators, slow their performance or cause all work to stop. Remember the engineer's definition of reliability: mean time between failures (MTBF). Unedited manuals are unreliable.

Engineering a Manual

As in systems analysis and design, the key to making effective, usable documentation is to *shift the effort to the front end of the development process.* Strategic errors (the most serious) cannot be averted once the manuals have been outlined and sent into production. Structural errors become virtually uncorrectable once the first draft is written. And tactical errors resist correction once the manual is in use.

As in programming, the goal is to test and revise as early as possible: to build conceptual and working models of the documents before they are written. Figure 1 shows what I call the "structured documentation scheme," an approach that applies structured methods to documentation.



USERS / TOPICS	A	B	C	D	E	F
1	✓	✓				
2	✓	✓		✓	✓	
3			✓	✓		
4	✓	✓	✓	✓		
5	✓	✓	✓	✓		✓
6			✓	✓		✓
7	✓	✓	✓	✓		
8	✓	✓	✓	✓		
9				✓		
10				✓		
11				✓		
12						

Figure 2. Topic/User Matrix

To prevent strategic errors, a team of analysts (including technical experts, documenters and users) defines the set of books, manuals, reference aids and other documentation products needed for the particular hardware or software system. This list derives mainly from a *topic/user matrix,* an array of user categories vs. system features and characteristics or topics (see Figure 2).

The analysts decide whether each of the topics is of interest to each of the user categories. Then, using this simple analysis, the team defines clusters or packages of topics that should form individual publications or other documentation products. The grouping can be by function, audience or a combination of both.

The output of this stage is a list called the documentation set, a report that names the documents to be prepared, defines their scope and content and describes the target audience and emphasis. With the addition of schedules, budgets and "book chiefs," the documentation set becomes the publications plan.

Most large firms already have a formal way of developing the publications plan; however, a poor plan may be as bad as none. At this early stage, momentous strategic errors may already be wired into the plan. If there is only one document in the plan (or too few, without any tailoring to the needs of special audiences), then the readers will be forced to struggle with irrelevant and inaccessible material — no matter how clearly it is written and presented. Conversely, if there are too many volumes without enough redundancy and overlap across books, users will often need to jump across volumes.

In short, the job of the documentation team at this stage is to test this broad plan against the anticipated uses of the documents and to keep testing until it has defined a mix or library of publications that — given the limits of time and budget — is as free from strategic problems as possible.

For each document specified in the set, there must be a detailed design — a model of the publication. The documentation set (or publication plan) contains only the broadest specifications of the manuals and other products; now, the task is to build complete, testable designs for each.

The process, as shown in Figure 3, is to conceive of each document as a collection of documentation modules (I call them "DOCs"). Thus, a conventional outline is converted to a structured outline by "decomposing" each entry in the conventional

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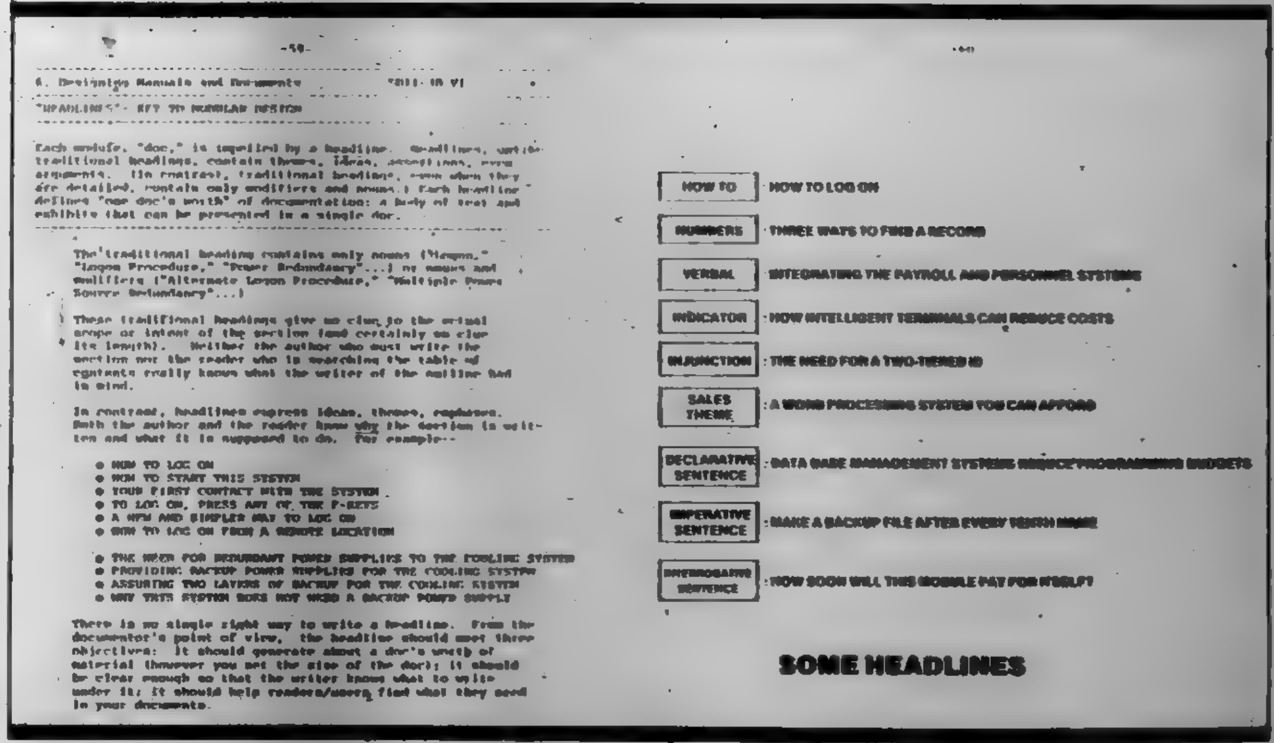
outline into a series of headlines, each corresponding to some standard-sized module of documentation.

To solve the most serious of the structural problems (the separation of text from the exhibits to which it refers), designers should think of each module or DOC as a synoptic array of text and exhibits around a single theme. In other words, everything in the DOC can be seen at once, without turning a page.

In its simplest form, then, a module of documentation is one page of any size. That is, a DOC can be smaller than 8½ by 11 in., or it may be larger — even poster-sized. The most versatile module of documentation is two facing pages, with text on the left and exhibits on the right. This use of two-page modules in technical publications was conceived and popularized in the early 1960s by a team of editors at Hughes Aircraft; they call the concept "Sequential Thematic Organization of Publications (Stop)."

A structured outline, then, is a series of headlines, each presumed to generate one module, one DOC's worth, of documentation (see Figure 4). Obviously, the process of developing such an outline is rather unfamiliar to most professional documenters and to most amateurs — programmers and administrators conscripted into the documentation job. But ironically, the job of developing the outline does resemble the structured design process of converting program specs to module specs.



-59-

6. Designing Manuals and Documents [illegible]

"HEADLINES"- KEY TO MODULAR DESIGN

Each module, "doc," is topped by a headline. Headlines, unlike traditional headings, contain themes, ideas, assertions, even arguments. (In contrast, traditional headings, even when they are detailed, contain only modifiers and nouns.) Each headline defines "one doc's worth" of documentation: a body of text and exhibits that can be presented in a single doc.

The traditional heading contains only nouns ("Logon," "Logon Procedure," "Power Redundancy"...) or nouns and modifiers ("Alternate Logon Procedure," "Multiple Power Source Redundancy"...)

These traditional headings give no clue to the actual scope or intent of the section (and certainly no clue its length). Neither the author who must write the section nor the reader who is searching the table of contents really knows what the writer of the outline had in mind.

In contrast, headlines express ideas, themes, emphases. Both the author and the reader know why the section is written and what it is supposed to do. For example--

- HOW TO LOG ON
- HOW TO START THIS SYSTEM
- YOUR FIRST CONTACT WITH THE SYSTEM
- TO LOG ON, PRESS ANY OF THE F-KEYS
- A NEW AND SIMPLER WAY TO LOG ON
- HOW TO LOG ON FROM A REMOTE LOCATION

- THE NEED FOR REDUNDANT POWER SUPPLIES TO THE COOLING SYSTEM
- PROVIDING BACKUP POWER SUPPLIES FOR THE COOLING SYSTEM
- ASSURING TWO LAYERS OF BACKUP FOR THE COOLING SYSTEM
- WHY THIS SYSTEM DOES NOT NEED A BACKUP POWER SUPPLY

There is no single right way to write a headline. From the documentor's point of view, the headline should meet three objectives: It should generate about a doc's worth of material (however you set the size of the doc); it should be clear enough so that the writer knows what to write under it; it should help readers/users find what they need in your documents.

-60-

HOW TO : HOW TO LOG ON

NUMBERS : THREE WAYS TO FIND A RECORD

VERBAL : INTEGRATING THE PAYROLL AND PERSONNEL SYSTEMS

INDICATOR : HOW INTELLIGENT TERMINALS CAN REDUCE COSTS

INJUNCTION : THE NEED FOR A TWO-TIERED ID

SALES THEME : A WORD PROCESSING SYSTEM YOU CAN AFFORD

DECLARATIVE SENTENCE : DATA BASE MANAGEMENT SYSTEMS REDUCE PROGRAMMING BUDGETS

IMPERATIVE SENTENCE : MAKE A BACKUP FILE AFTER EVERY TENTH [illegible]

INTERROGATIVE SENTENCE : HOW SOON WILL THIS MODULE PAY FOR ITSELF?

SOME HEADLINES

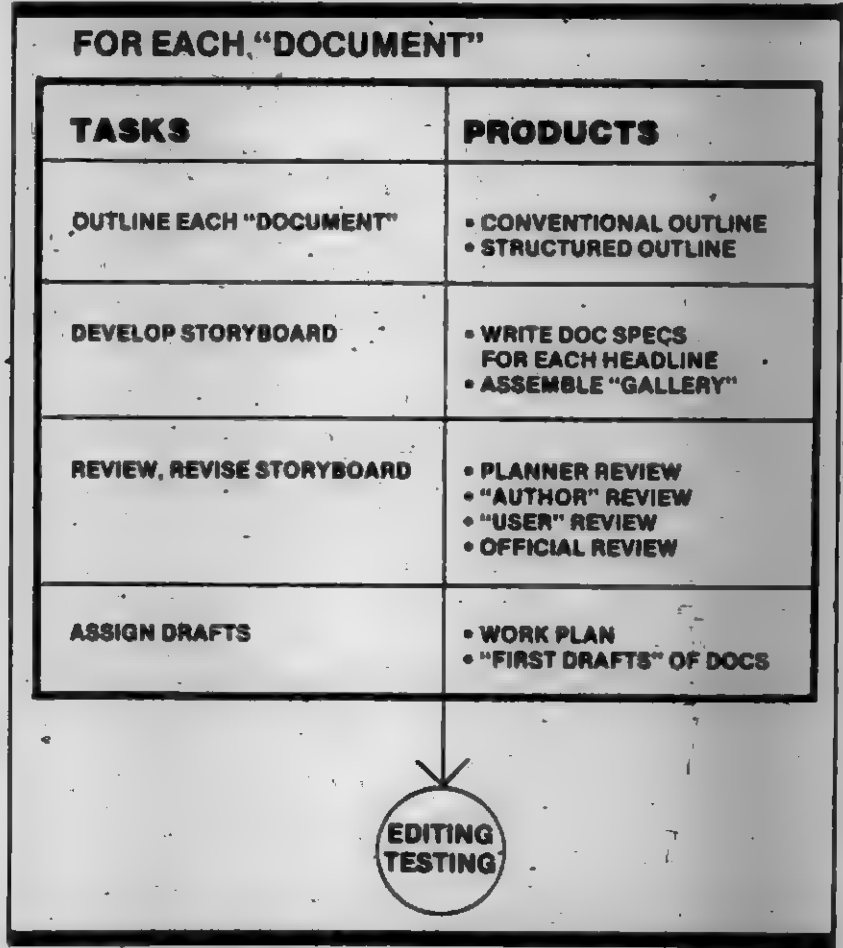
Figure 4. A Two-Page DOC

The outline is only the tentative or preliminary list of modules. Next, the book designers write a DOC spec for each module: a brief, but substantive plan saying what will be covered in the module. The spec should be clear and complete enough so that another person could finish writing the DOC and produce a result that would satisfy the people who wrote the spec. (More correctly, they could finish a first draft of the DOC.)

To test and revise the book while it is still in this "model" stage, the writers of the DOC specs post them in a storyboard or gallery, an array of all the DOC specs laid end-to-end. Then, the designers review and revise the storyboard until they are satisfied that the current sequence causes no more skipping and changing of direction for the intended users than is absolutely necessary.

When the designers are satisfied, they invite other people to "walk through" their storyboard. Among the reviewers are the likely "authors" of the missing details. The DOCs need not be finished by professional technical writers. In addition, if the storyboard is used correctly, each module can be finished independently of the others; in principle, 50 authors could produce the first draft of a 100-page manual in about two hours.

Finally, anyone with a serious interest in the manual's usability — users, marketing people, officers of the organization — is encouraged to review the storyboard, to test the model. Unlike traditional outlines for manuals, storyboards are full of substantive technical content, even



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ASSIGN DRAFTS	• WORK PLAN • "FIRST DRAFTS" OF DOCS

EDITING TESTING

Figure 3. Designing the Individual Documents

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rough drawings of exhibits and diagrams. The reviewer sees a remarkably clear picture of the book that will emerge; in contrast, the typical outline of technical publications tells the reviewer almost nothing.

The principal advantage of the storyboard technique is that it eases change and revision. A storyboard can be revised radically 10 times a day; in contrast, a full first draft will be patched and plugged, but never really redesigned.

> ***'Almost any competent technical writer or editor can eliminate most bugs in a first draft. But most user documentation reaches its readers without a single glance from someone who knows the rules of English.'***

Interestingly, this radical revision consists of only a few "moves." The full range of changes can be accommodated by *decomposing* — making one module into more than one; *consolidating* or collapsing small modules into one; *inserting* or *deleting* modules; or *restructuring* — moving a cluster of modules to a different place in the sequence. Most changes result in a new DOC spec. DOC specs take about 10 minutes to write — less if they fit into a repeating pattern.

Once the storyboard is approved, the DOC specs are pulled down from the gallery and distributed to the authors. In the best case, in which the modules are independent and the design of the book frozen, all the authors work independently and in parallel. The author with the most DOCs is the "critical path."

Cutting Tactical Errors

The final stage is editing and revising for tactical errors — unclear and incorrect language that forces readers to "loop" on incomplete and ambiguous sentences — or even to break down entirely.

What the document needs at this stage is someone who knows how to convert a clumsy, difficult, badly written first draft into one that is clear.

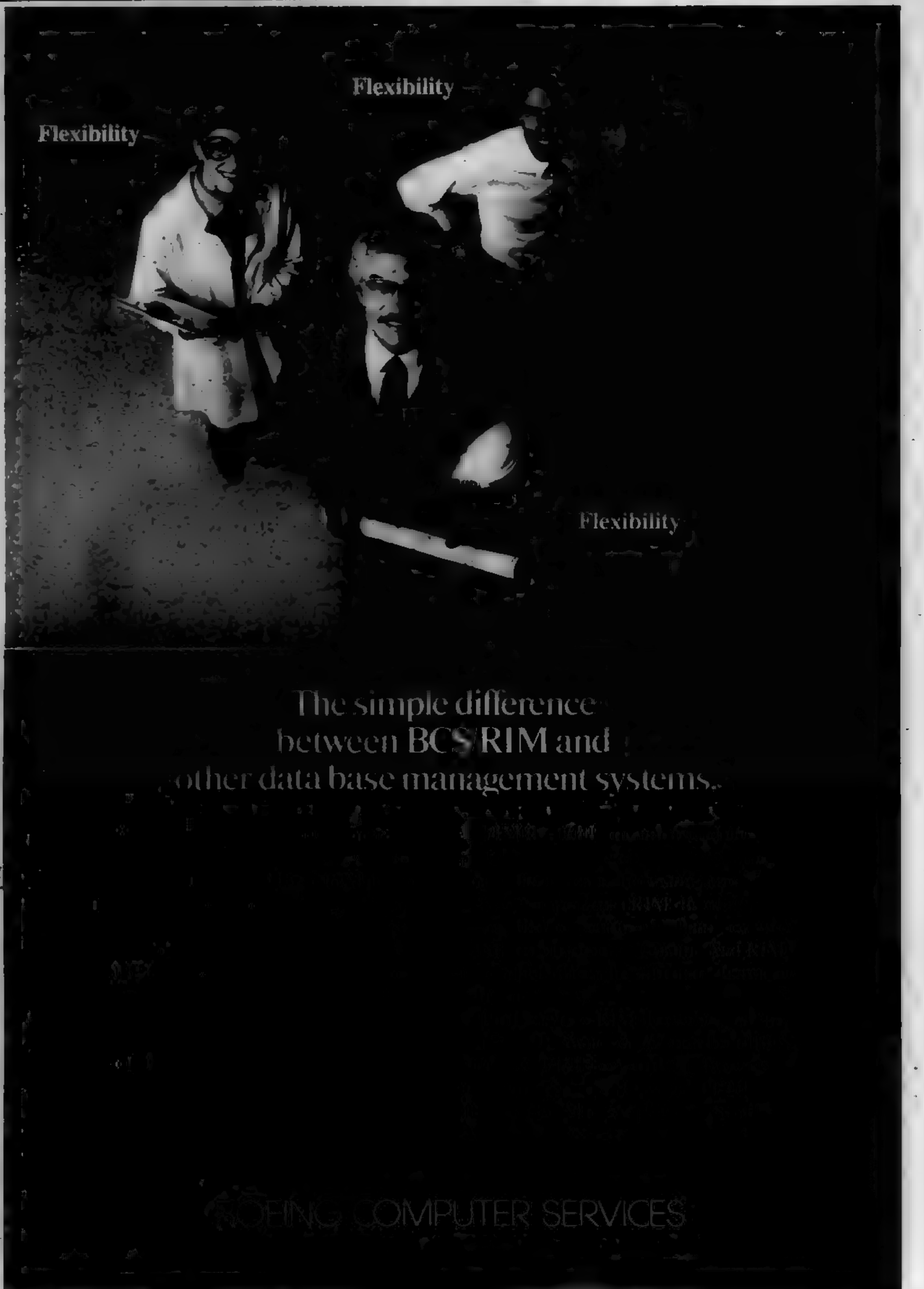
Most firms that use professional editors leave them hardly enough time to correct the mechanical errors of spelling and grammar in the first draft. Instead, they use all the review time to spot and correct technical errors. Ironically, though, clumsy writing masks technical errors; a manual must be written clearly so that the technical reviewers can find errors. Every organization that publishes unedited drafts issues material that is not only hard to read but technically inaccurate.

Almost any competent technical writer or editor can eliminate most of the bugs in a first draft. But most user documentation reaches its readers without a single glance from someone who knows the rules of English!

More than grammar, punctuation and spelling, the issue is usability: making the text easy to process and difficult to misunderstand.

Small things can make a big difference. The following should be avoided:

- Unnecessarily long words, like *utilize* for *use* and *initiate* for *start*.
- Vogue words and jargon, like *capability* and *environment*, which mean so many things to so many people that their precise meaning is all but lost.
- Long-winded phrases, like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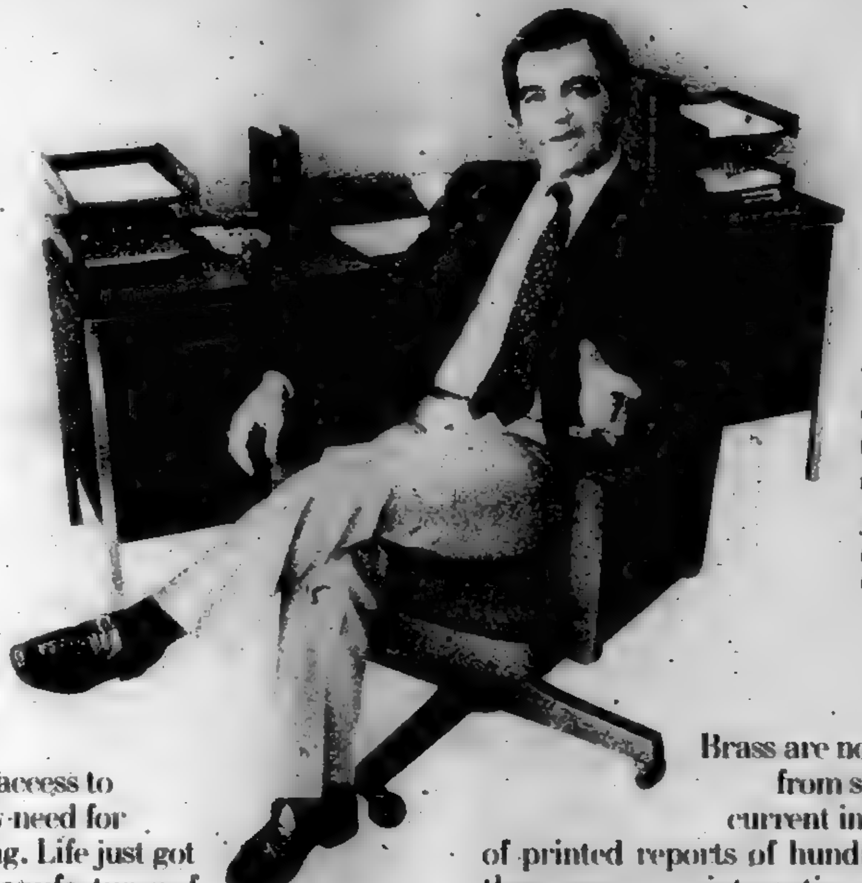

"SQL gives our users more of the right information when they need it. And in the most useful form."

Jim Whatley
Director of Data Processing
U.S. Brass

User management at U.S. Brass now has quicker access to exactly the information they need for faster, better decision making. Life just got easier at the Dallas-based manufacturer of plumbing supplies. Thanks to the IBM Structured Query Language/Data System (SQL/DS)—a new IBM product and a whole new way of doing data processing.

One of the most powerful and easily used systems IBM has ever devised. SQL is an application development tool built around "relational" data-base techniques.

SQL lets U.S. Brass people extract items from the company's operating data base using any desired selection criteria. They can organize the items into any convenient sequence and format or structure.

One result, Whatley says, was the near-elimination of the backlog of one-time and "on-request" projects that once took 70 percent of the company's programming resources. And turnaround time for the users was cut from days to a few minutes.

"SQL has improved our reputation throughout the company," Whatley adds. "We use it all day long. It has eliminated 80 percent of the unplanned programming requests that were coming to us."

With a bit of tutoring at the terminal, manufacturing, marketing, and customer service professionals at U.S. Brass are now deriving vital information from sales history, open-order files, current inventory and the like. Instead of printed reports of hundreds or thousands of pages, these users are interacting with the data base through SQL to extract and condense exactly the current data they need.

SQL, which runs under DOS/VSE, is available at U.S. Brass on an IBM 4341. Along with end users, SQL also serves the company's professional programmers, who use it to apply the power of relational technology to production programs as well as on-request projects.

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1. Ascertain whether there is sufficient paper to print the report.	1. Be sure there is enough paper to print the report.
2. Does this payroll package have a check printing capability?	2. Can this payroll package print checks?
3. Calculation of the expected profit and payback is accomplished in the TRND module of the program.	3. The TRND module calcuates the expected profit and payback.
4. Care should be exercised by operators that they may not press CLEAR DISPLAY when they mean to press INSERT CHARACTER.	4. When you mean to press INSERT CHARACTER be careful not to press CLEAR DISPLAY.
5. Press CONTROL and BK in the event that you want to backspace without erasing.	5. To backspace without erasing, press CONTROL and BK.
6. It is a requirement that user department managers initial the F-Spec to show their approval.	6. To show their approval, the user department managers must initial the F-Spec.
7. The project engineer possesses the data verification responsibility.	7. The project engineer should verify the data.

Figure 5. Some Edited Sentences

should it prove to be the case that instead of *if*, or *by means of the utilization of* instead of *with*.

• Smothered verbs, like *make a recommendation* instead of *recommend* or *effectuate a linkage* instead of *link*.

The most important tactical improvement is assuring that the parts of sentences are in the proper sequence. That is, in a well-made (edited) sentence, the main, emphasized material will generally appear at the end. That's right, at the end! Writing what the grammarian calls a periodic sentence — a sentence that saves its main material for last — allows the reader to read in a straight line. In contrast, the loose sentence — which blurts out its main content at the beginning — is generally harder to read and more likely to force the reader to read twice.

BEFORE (Fog Index 21.6)

Following identification of needs and appropriate preliminary approval of all major system development project proposals, the Information Systems Department will prepare an analysis and recommendation for action. The more routine requests will be approved by concurrence of the Information Systems Department and of the functional area management without further review. Those requiring a change in policy, exceeding approved budgets or crossing organizational lines will require review and approval by the Steering Committee as well.

The Information Systems Department will evaluate the capability of the user or regional technical staff to implement a proposed system. Based on this evaluation, the responsibilities and authorities of the Information Systems Department, regional technical staff and the user will be outlined in a system development proposal submitted to the Steering Committee.

AFTER (Fog Index 11.4)

First, needs are identified and major development proposals get preliminary approval. Then, the Information Systems Department analyzes each request and recommends an action.

For small, routine requests, the Information Systems Department and the manager of the functional area may approve the project without further review. (A project is "routine" if it does not call for a change in policy, exceed current budgets or cross organization lines.)

For major requests, though, the Steering Committee must also approve. To advise them, the Information Systems Department submits its own evaluation, which proposes schedules and tasks for all the participants.

Figure 6. Passage Edited to Reduce Difficulty

The most succinct discussion of this basic point is in the famous *Elements of Style*, by William Strunk and E.B. White — a book that is apparently far more bought than read. Figure 5 shows the benefits of editing first-draft sentences.

Most of these changes make the sentences not only clearer but also easier to read. Even when the intended user is a computer professional or engineer, there is nothing to be gained by burdening him with unnecessarily difficult instructions. In Figure 6, the "before" version scores above the 21st grade reading level of difficulty on Robert Gunning's Fog Index. The "after" version is just over the 11th grade — without any loss of information or precision.

Documenter as Engineer

If documentation is a system and a manual is a program, then documenters are vulnerable to the same mistakes as analysts or programmers.

In 1979, Robert Perrón made the following observation: "Without carrying the analogy to extremes, a comparison of programming in its early days to technical documentation in its present state yields some striking similarities" ["In Search of Disciplined Documentation," CW In Depth, Sept. 10, 1979]. What did Perron mean? I believe he meant that documenters — especially those who call themselves writers — have many of the same blind spots and bad habits that, in the 1960s, precipitated the conversion of programming from a secretive, individualistic art form into a branch of engineering.

Most of what ailed programming in the days before "structured methods" caught on still ails the fledgling documentation shop. For the most part, documenters still work alone, unable and unwilling to communicate what they do to other people. They still view themselves (and are viewed) as artists, with informal and eccentric methods that defy budgets and schedules. Like early programmers, they do not build models of their products, but wait until the first draft is done — much too late — for the first real tests and revisions.

Modern documenters have yet to learn the lesson of software economics: It costs more to maintain and modify documents than to develop them. That is, a cost-effective manual is not one that is produced cheaply. Rather, it is one that is economical to maintain and modify and does not cause expensive breakdowns in actual use. Indeed, a few hours spent testing the design of an operator's guide can save hundreds of hours in follow-up services and thousands of dollars in lost productivity.

One final note: The paradox of usability is that the more usable the system, the less need for user and operator manuals. Ironically, the greatest way for the documenter to enhance a system's usability is to suggest a change in the system itself that will reduce the need for user documents. Easy procedures need less explanation than difficult ones; modular programs are more easily depicted than "spaghetti" programs.

Most documenters will not get a chance to influence the systems and procedures they must write about; the systems' designs will constrain their manuals' usability. But some fortunate documenters will get to change the screens and procedures themselves, to make them "self-documenting." In that direction lies the ultimate usability.

About the Author

Edmond H. Weiss is an independent consultant, author and lecturer based in Cherry Hill, N.J. He regularly conducts a seminar on "Structured Documentation."

Weiss is the author of The Writing System for Engineers and Scientists *(Prentice-Hall, 1982) and* How to Document a Computer System, *which will be published by Prentice-Hall in early 1983.*

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Responsibility Shifting to DP Realm

Big Firms Up Micro Disk Use: Report

By Bob Johnson
CW New York Bureau

NEW YORK — Large organizations will be the single biggest users of microcomputer disk drives between now and 1986, and the procuring responsibility for these units is shifting more and more towards the DP department.

That is what was revealed in a recent interview here with Steven L. Ossad, author of a recent research report entitled *Microcomputer Disk Drive Industry*, which was released by the New York firm of Sanford C. Bernstein & Co., Inc.

The report said that because of a heavy proliferation of installed base microcomputer workstations in large companies and the need for extra storage capacity, nearly six million disk drive units will be shipped to these users by 1986.

Ossad said it is because of that fact that it is becoming increasingly important for the DP department to realize this kind of market growth is taking place. He said that whereas DP departments had earlier inhibitions about controlling and coordinating the purchase of personal computers, workstations and peripheral equipment for their users, fortunately, they are now realizing that becoming involved in this type of equipment purchasing decision is inevitable.

"Procurement is moving back to the DP department, and in light of our study on the microcomputer disk industry, this segment is one of major importance. In previous times, the DP department took a decentralized approach to users' computer equipment needs, but this is no longer the

(Continued on Page 56)

CDC Add-On Memory Increases Storage Capacity of IBM 3033s

MINNEAPOLIS — Control Data Corp. has announced the availability of add-on main memory to increase the maximum storage capacity of all IBM 3033 mainframe computers to 32M bytes of data.

This capacity is 8M bytes greater than the maximum storage currently available from IBM, CDC said.

The add-on memory reportedly employs 64K MOS memory chip technology and is totally compatible with the performance and functional characteristics of the IBM 3033 mainframe computers.

Maintenance of System

In addition to the third-party add-on memory, CDC offers maintenance of the entire IBM processor and memory system, thereby providing single-source maintenance responsibility, CDC said.

The price of the CDC main memory expansion is $21,500/1M byte to increase 3033 storage beyond 16M bytes of data.

CDC's Peripheral Systems Division is based at 2200 Berkshire Lane, Minneapolis, Minn. 55441.

Communicate Via Ethernet

Xerox CAD/CAM Systems Out

SANTA CLARA, Calif. — Two computer-aided design and manufacturing (CAD/CAM) systems said to communicate via the Ethernet local-area network have been announced by Xerox Corp. and its wholly owned subsidiary, Versatec, Inc.

The Expert 1000 and 2000 systems incorporate the Xerox 8000 network system, the Xerox 8010 professional workstation and the Ethernet local-area network. These systems, primarily designed for electrical and mechanical engineers, reportedly allow users to create, file, edit, print and distribute information electronically.

A minimum configuration for an Expert system would consist of two 8010 workstations with a 29M-byte disk drive each, Ethernet, Versatec electrostatic plotter, a magnetic tape drive unit, a file server with an 80M-byte disk drive and the software package. The price for this system would be about $180,000. Each additional workstation would cost about $35,000.

More information on the Expert 1000 and Expert 2000 is available from Versatec at 2805 Bowers Ave., Santa Clara, Calif. 95051.

Firm Depends on U.S. System To Develop Nigerian Capital

ABUJA, Nigeria — To help transform a desolate area of African bush country into Nigeria's new capital city, a German surveying company is relying on American computer systems.

In cooperation with Nigerian partners, Geodata, the surveying organization, has already completed more than 15 projects in Nigeria since 1978. These include basic geodetic work, topographic mapping and surveying for underground facilities.

"Geodata's corporate philosophy has been to augment the expertise of its staff with the latest in technological advances," said Horst Wurtzler, vice-president of the company. He said the company has been computer-oriented since its inception, and now it boasts graphics, interactive mapping and various calculation capabilities.

At the heart of Geodata's in-house data processing equipment is a Harris Corp. 300 superminicomputer system with 768K bytes of memory; a Harris S-125 computer with 512K bytes of memory; two 160M-byte and one 80M-byte disk drives; a host

(Continued on Page 58)

Eclipse S/20 Memory Up, Cost Cut

WESTBORO, Mass. — Data General Corp.'s Technical Products Business Unit has announced that the maximum memory available with its Eclipse S/20 computers has been raised from 512K bytes to 2M bytes, while the prices of the S/20 system with 256K bytes and 512K bytes have been slashed by 30%.

DG said the memory increase and price reductions are the results of high-density 64K-bit random-access memory (RAM) semiconductor technology, now incorporated into the systems.

The S/20 system, with 2M bytes of 64K-bit RAM memory and battery backup, is priced at $17,400. A fully configured system, including 1M byte of memory, a 25M-byte disk and diskette using DG's MP/AOS real-time, multiprocessing, multitasking operating system, costs $25,900.

DG is located at 4400 Computer Drive, Westboro, Mass. 01580.

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Xerox Manufacturing System Targets IBM Users

NEW YORK — Xerox Computer Services (XCS) last week introduced the Xerox Manufacturing System for use with IBM mainframes.

The "advanced generation" product is a fully integrated software system which incorporates hardware and is capable of handling manufacturing, financial, distribution, marketing, engineering and procurement applications, the vendor said. XCS President Haig M. Bazoian added that the product is aimed at firms with annual sales between $15 million and $250 million.

The software reportedly operates on all IBM 4300, 3000 and 370 computers under DOS/VSE, SSX, OS/VS1 and MVS operating systems.

Scheduled for availability this month, the system will be offered to users either as a software package with 16 separate application modules priced between $15,000 and $35,000 each or as a time-sharing service.

It features data base tools, decision support systems and the incorporation of the Xerox Corp. 820-II personal computer for host communication or executive applications, according to XCS.

Bazoian said that he feels his company's new product fills a gap which up until now has been left open. In addition, he claimed that many manufacturers have been using a patchwork of different systems in an attempt to hold their business functions together.

The executive stressed that the XCS system does not merely interface between applications and systems, but fully links them together. "With the system in place, all of a manufacturer's operations are talking to one another. We have designed a single, unified architecture," he said.

Bazoian stated that his company is taking a new direction away from just being a time-sharing service and towards a "technological utility."

He said that XCS is part of a "new generation" of computer software and services companies which will offer users integrated applications and systems software, hardware, professional services and smooth integration of the personal computer with large systems. Additionally, he said that these new companies will offer full consulting and educational support.

Commenting on how he feels the manufacturing system will improve American productivity, Bazoian said, "We feel it's time for an advanced generation of manufacturing systems to improve American productivity. American manufacturing computer systems are getting old. About two-thirds of user software is over five years old and more than a third is 10 years old or beyond."

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NMA Seeks Name Change

SILVER SPRING, Md. — The National Micrographics Association (NMA) Board of Directors has unanimously recommended that its membership vote to change the association's name.

The proposed new name, Association for Information and Image Management, would be officially adopted July 1, pending membership approval. The new name is thought to express the organization's wider scope, according to the board.

Ballots will be mailed in February, and results will be tallied for the NMA's annual meeting, slated to take place in Philadelphia April 13.

Further details can be obtained from 9 Colesville Road, Silver Spring, Md. 20910.

Storage Unit Out For HEP Line Of Processors

AURORA, Colo. — Denelcor, Inc. has announced a mass storage subsystem for its heterogeneous element processor (HEP) line of scientific processors.

Offered as an add-on option, the subsystem was reportedly designed to provide large-volume, high data rate capabilities to the firm's HEP system, the vendor said.

The mass storage unit is field-expandable to allow the user to increase cache memory as well as boost the number of I/O channels and the amount of disk storage capacity. For instance, cache memory can be increased in 8M-byte increments to a maximum of 128M bytes. In addition, a total of 32 I/O channels are available, with each channel serving a disk storage module. The module consists of two 300M- or 600M-byte disk drives.

Finally, up to 9G bytes of disk storage can reportedly be attached to each mass storage subsystem, the vendor said.

The cost for the mass storage subsystem ranges from $450,000 for an 8M-byte configuration up to $3 million for a 128M-byte configuration. Information concerning the mass storage system can be obtained from Denlecor, headquartered at 17000 E. Ohio Place, Aurora, Colo. 80017.

Graphics Display System Boasts Flicker-Free Memory

NORTH BILLERICA, Mass. — Raster Technologies, Inc. has introduced its Model One/60 graphics display system, reportedly featuring a flicker-free refresh memory that is compatible with 13- to 19-in. monitors.

The Model One/60 has a 768 pixel by 576 pixel displayable resolution window on a 1024 by 1024 bit map. The displayable window can pan and zoom across the nonvisible memory, which can also be used to store text fonts and special symbols, according to the vendor. The display can simultaneously show up to 64 colors.

Prices for this system range from $11,000 to $18,500, depending on configuration, the vendor said from 9 Executive Park Drive, North Billerica, Mass. 01862.

Bar Code Wand Fits RS-232

MOUNTAIN VIEW, Calif. — Intertelephon U.S.A., Inc. has announced a bar code reader wand and decoder that can be used with a standard RS-232 port.

It uses existing LED, photosense and microprocessor-controlled algorithms, according to the vendor.

The wand costs $75, a spokesman said from 1185 Terra Bella Ave., Mountain View, Calif. 94043.

CAD/CAM Turnkey Unveiled

WOODLAND HILLS, Calif. — Vector General has recently entered the turnkey computer-aided design and manufacturing system (CAD/CAM) market with the introduction of a system that is said to combine the firm's display stations with its IBM-compatible mainframe computer as well as a wide range of storage and other peripheral devices.

The System 8000 will run either Cadam, Inc.'s Cadam software or Northrup Corp.'s N-Cad software or both concurrently, according to the vendor.

A 12-station system is being offered at $540,000 or $45,000/workstation. This configuration reportedly includes 4M bytes of active memory, 400M bytes of disk storage, a 1600 bit/in. magnetic tape drive, a 600 line/min. printer, three selector channels and an integrated communications controller, the vendor said.

Vector General is headquartered at 21300 Oxnard St., Woodland Hills, Calif. 91367.

Pen Plotters Announced

DENVER — Auto-trol Technology Corp. has announced two drafting pen plotters for users of its V77-800 system, its 32-bit Advanced Graphics Workstation and Digital Equipment Corp.'s VAX series of computers.

One drafting pen plotter has a maximum plotting area of 24.5 in. by 46.85 in., while the larger drafting pen plotter has a maximum plotting area of 36.5 in. by 46.85 in., the vendor said. Both can reportedly plot using wet ink, roller ball or fiber tip pen types. It can use as many as eight colored pens in one carousel, and pens are automatically capped when not in use, the vendor said.

These plotters start at $24,000, the vendor said from 12500 N. Washington St., Denver, Colo. 80233.

CAD/CAM Out on T/S

FOXBORO, Mass. — Engineering & Design Associates, Inc. (EDA) now offers the use of its computer-aided design and manufacturing (CAD/CAM) system to other high-tech design and manufacturing firms on a time-sharing basis.

EDA's Computervision M3100N Designer M Series CAD/CAM system includes software for both mechanical and electrical designs, according to the vendor. The system also reportedly performs complex engineering computations and analyses.

Costs are based on line charges and volume. Further details are available from EDA, which is located at 132 Central St., Foxboro, Mass. 02035.

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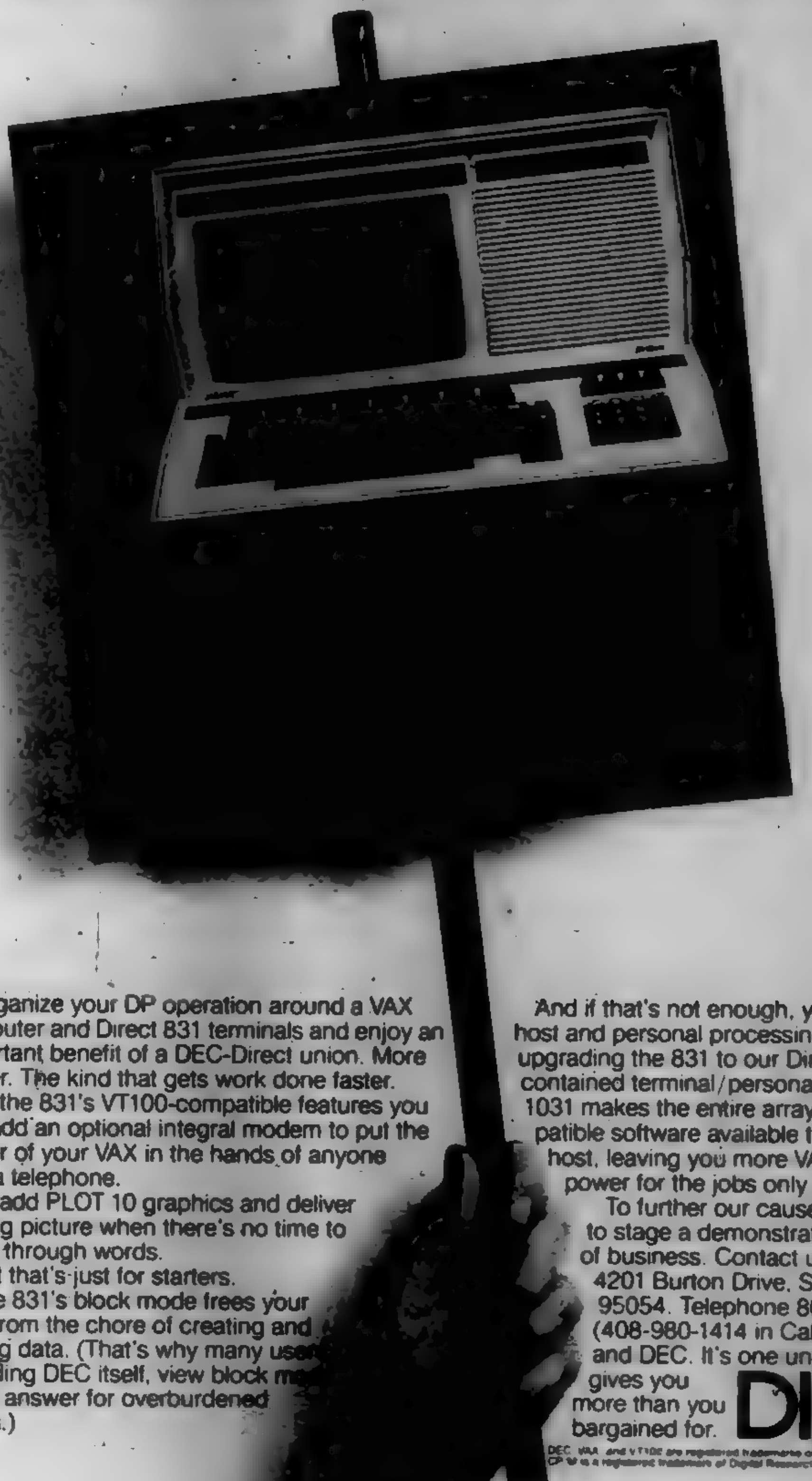

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Anvil-4000 Fits DG MV 32-Bit Line

WESTBORO, Mass. — Manufacturing & Consulting Services, Inc. (MCS) of Irvine, Calif., and Data General Corp. here have announced that the MCS Anvil-4000 Mechanical/CAD/CAM software system is available from MCS on DG's MV family of 32-bit computers.

Anvil-4000 is an integrated system for mechanical design, drafting and manufacturing. Among its features are geometric construction and file management.

The base package costs $31,000; with drafting package, $46,000; with numerical control, $57,000; or, with extended geometry, $59,000 from MCS at 17942 Cowan, Irvine, Calif. 92714.

Graphics Terminal Out

ITHACA, N.Y. — Ithaca Intersystems, Inc. has announced Graphos, a desktop color graphics terminal for computer-aided design and manufacturing applications.

The unit can accommodate up to 16 windows and features 640 pixel by 480 pixel resolution, individual scroll, pan and zoom for each window, segment retention without retransmission, two-dimensional segment transformations, high-level primitives and an optional nine-slot S-100 motherboard.

Graphos is available with most commonly used protocols and costs about $8,000, the vendor said from 1650 Hanshaw Road, Ithaca, N.Y. 14850.

Disk Drives Researched

(Continued from Page 53)

case," he said.

According to Ossad's study, by the end of 1986, the installed base of microcomputer workstations will reach seven million in large organizations and government combined. And, given the "memory-intensive" application needs generated by this much hardware and the steep decline in prices in the unit cost of memory, the report predicted auxiliary memory capacity per system to rise sharply.

Increased System Capacity

"Our forecast calls for the average system to contain about 7M bytes of capacity by 1986 vs. about 2.5M bytes currently," the study said.

Ossad pointed out that corporate DP departments for the most part will not necessarily be concerned with the entire microcomputer disk drive market that his study reflects, but more with the 8-in. floppy disk that is better geared toward hardware for large company applications.

However, he said that the overall study reflects the growing need for DPers to be aware of the impact user areas will have on DP as a whole, especially in the memory market.

"We expect only a modest shift to 5¼-in. floppies from the 8-in. designs. The inertia here will reflect vendor concern for maintaining compatibility between different generations of equipment and the recent advances in reducing the physical size of 8-in. floppies," the study said.

The report is available for $600 from Bernstein & Co., 767 5th Ave., New York, N.Y. 10153.

Lee Data's NEW All-In-One Display System is ~~a better~~ the best choice for your 3270 requirements.

You get economy with Lee Data's Coax Eliminator™ and unsurpassed character clarity with our new high resolution All-In-One display. And you get the choice of BSC or SNA communications in either remote or local cluster systems.

DISPLAY ADVANTAGES

☐ Four 3278 compatible screen sizes in a single All-In-One display: 24, 32 and 43 lines by 80 columns and 27 by 132.
☐ Unsurpassed character clarity with no flicker achieved with a screen refresh rate of 60 times per second, twice that of similar displays.
☐ Display cabinet tilts 25 degrees vertically and rotates 180 degrees horizontally for convenient and comfortable viewing angles.
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☐ Detached and lightweight keyboard with 9' extendable coil cable—available in five standard and many special styles.
☐ Display is lightweight, only 31 lbs.
☐ Display is also compact, with a base footprint of only 14" x 16."

The Lee Data Interactive Display System also includes: Model 310 Remote Controller, Model 320 Local Controller, Matrix Printer and the exclusive Coax Eliminator, Models C/8, T/1 and T/8.

SYSTEM ADVANTAGES

☐ A full range of controllers emulate IBM 3274 local and remote systems using either BSC or SNA communications.
☐ Multiple microprocessor design provides a system that easily meets the performance demands of a 32 station cluster.
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☐ Save coaxial cable costs with the Coax Eliminator™ that supports up to eight displays or printers on one coaxial cable or twisted wire circuit.
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D/A Board Out for Intel

MANSFIELD, Mass. — Datel-Intersil, Inc. has introduced an eight-channel, 16-bit resolution multibus digital/analog (D/A) board.

The ST-716 16-bit D/A boards are form- and fit-compatible with Intel Corp. Multibus-based computers and were designed to slide directly into the host computer's card cage, according to a vendor spokesman.

In addition, they are memory-mapped for easy software control and provide standard output ranges to simplify interfacing with industrial controls and instrumentation equipment, the vendor spokesman maintained.

The ST-716 is compatible with both 8- and 16-bit Multibus-based systems and supports 20-bit addressing, the spokesman said. The ST-716 bus input registers are double buffered. This reportedly enables each channel to be loaded with all 16 bits in parallel (16-bit systems) or in two consecutive 8-bit bytes (8-bit systems).

The ST-716-A with four D/A channels is priced at $690. The ST-716-B, with eight D/A channels is $995, and the ST-716-C with four D/A channels with ac and dc converter is $745, according to the vendor spokesman.

Datel-Intersil may be reached at 11 Cabot Blvd., Mansfield, Mass. 02048.

DG Viking, CRS-55 Get Printers

MINNEAPOLIS — Control Data Corp. has announced two daisywheel desktop printers for its Viking 721 and 722 display terminals and the CRS-55 remote entry system.

The devices are all compatible with the firm's high-end Cyber 700 and 800 series mainframes.

The 727-40 daisywheel printer can operate at 40 char./sec. The 727-55 can operate at 55 char./sec. Both models can print from 132- to 163 char./line at 10 to 12 char./in. The printers were designed for an office environment and operate at a noise level of about 65 db, the vendor said.

The 727-40 costs $2,150 and leases for $90/mo plus a $45/mo maintenance fee on a on a one-year agreement. The 727-55 costs $2,895 and leases for $121/mo plus $49/mo on a one-year contract, according to the vendor.

CDC can be reached through P.O. Box O, Minneapolis, Minn. 55440.

Robotic Disk Handler Out

TUSTIN, Calif. — Applied Data Communications, Inc. has announced the Robotic Disk Handler, an automated disk loading and unloading device.

Based on a Zilog, Inc. Z80A microprocessor, the unit can handle up to 100 floppy diskettes. It can operate with either 5¼- or 8-in. diskettes.

The unit costs from $5,995, the vendor said from 14272 Chambers Road, Tustin, Calif. 92680.

TM990 Gets Controller, Memory Aid

DALLAS — A floppy disk controller and two memory-expansion modules have been added to Texas Instruments, Inc.'s TM990 family of single-board, 16-bit microcomputers.

The TM990/303B controller reportedly enables a TM990 CPU board to control up to four 8½-in. or three 5¼-in. floppy disk drives. It supports 20-bit host-memory addressing and stores and retrieves data via high-speed direct memory access transfers, the vendor said. The controller is priced at $1,250.

The TM990/202 is a user-configurable memory board for TM990-based 16-bit CPUs. The board features two banks of eight sockets each, and can include various combinations of static random-access memory (RAM).

Prices for this product start at $520.

The third board is the TM990/203A, a memory-expansion product that utilizes TMS4164 64K-byte RAM. It is available in 128K- and 256K-byte versions.

Prices for the TM990/203A start at $1,400.

TI can be reached through P.O. Box 202129, Dallas, Texas 75220.

GE 2120 printers reduce time-sharing costs. Because they don't spend a lot of time on-line.

In time-sharing, every minute your printer spends on-line costs you money. That's why a lot of people are taking the time now to look at the GE 2120 printer.

The GE 2120 will print at a sustained 150 cps and provides transmission speeds from 110 to 9600 baud. It has an optional 32K Text Editor which allows you to work off-line to reduce on-line time and communication charges as much as 70%.

Stylish, compact, lightweight, quiet, and easy-to-use, the energy-efficient GE 2120 printer comes with an outstanding list of standard features. Plus you get choices in paper handling: friction, pin feed platens, or adjustable tractors. And if you need more, we have more than enough options to choose from.

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General Electric also offers the GE 2030 printer. Identical to the GE 2120 in standard features and available options, the GE 2030 prints at sustained speeds up to 60 cps. And there is one other difference…it also costs less. So if you don't need the speed, selecting the GE 2030 may be your best choice.

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GENERAL ELECTRIC

Onyx Unveils Micro-Based Units

SAN JOSE, Calif. — Onyx Systems, Inc. has introduced three microprocessor-based systems that are said to support up to 11 users.

The systems join the firm's existing line of 8- and 16-bit systems.

Sundance 16 is an integrated computer/workstation that is available in two different models: the VT100-type with 132 columns and one with 80 columns. Both use 16-bit processors, 5¼-in. Winchester drives with 7M, 14M or 21M bytes of storage, 256K to 512K bytes of memory and a 12M-byte tape backup. Retail prices for the systems start at $12,990.

The C5002A is a 16-bit machine with a 5¼-in. internal Winchester disk with 7M, 14M or 21M-byte storage capacity, 256K or 512K random-access memory (RAM) and 12M-byte tape backup. This product is priced from $10,990.

Finally, the C8002A is a Bell Laboratories' Unix-based 16-bit machine with an 8-in. internal Winchester disk with 20M, 40M or 60M-byte storage, with the same amount of RAM and backup as the C5002A.

Retail prices for the C8002A start at $13,990.

Further details are available from the vendor at 25 E. Trimble Road, San Jose, Calif. 95131.

Systems Help Transform Nigerian Bush Into City

(Continued from Page 53)

of Harris peripherals; Tektronix, Inc. 4014 and 4010 graphics terminals and a collection of other interactive alphanumeric terminals.

The combination of computer mapping software with interactive hardware and peripherals is extremely effective, Wurtzler said. The rapid data transfer rates of the Harris systems allow Geodata to manipulate interactively models on the graphics screens and plotters. Since so much of Geodata's work is based on geographic coordinates, large volumes of data must be processed and plotted.

Geodata's computers provide the connecting link between other equipment, such as a Xynetics 1100 automated drafting system, four digitizing tables, a Carl Zeiss Planicomp C-100 analytical plotter and a digitally controlled Wild Aviophot OR-1 orthophoto projector.

The largest project Geodata has undertaken in Nigeria was a triangulation network covering the whole Federal Capital Territory of more than 10,000 square kilometers. This program has been underway for three years and is nearly complete.

Another project involves the design and staking out of waterworks for the new city, which will house approximately 250,000 people in 5,000 to 10,000 homes. This project also includes the management of mapping and storing the data on the underground services, such as water supply and other utilities. Without Geodata's digital mapping system, such an undertaking would be quite impractical, Wurtzler maintained.

"In the past two years, we have produced about 2,000 map sheets for development programs in Nigeria. I don't know of any other company that has produced so many map sheets in such a short time. This has been possible only due to the versatility of our computers and the availability of software. Otherwise, it would have required an army of draftsmen and photographers," Wurtzler said.

Extensive in-house software development is another function of the Harris 300 and S-125 computers, according to Geodata's DP manager Bernard Eggert. "We have developed sophisticated programs for surveying and land use, as well as interesting data base management, storage and information systems," he explained.

"Since we are probably digitizing more mapping data than anyone in Europe," Eggert continued, "we needed to find a more advanced method to deal with the digitized data. We devised our own benchmark test to help us decide which computer was right for us. We also discovered the Harris machine was able to run a large Fortran program, with 7,500 Fortran statements, in just one day. This was an important factor," Eggert concluded.

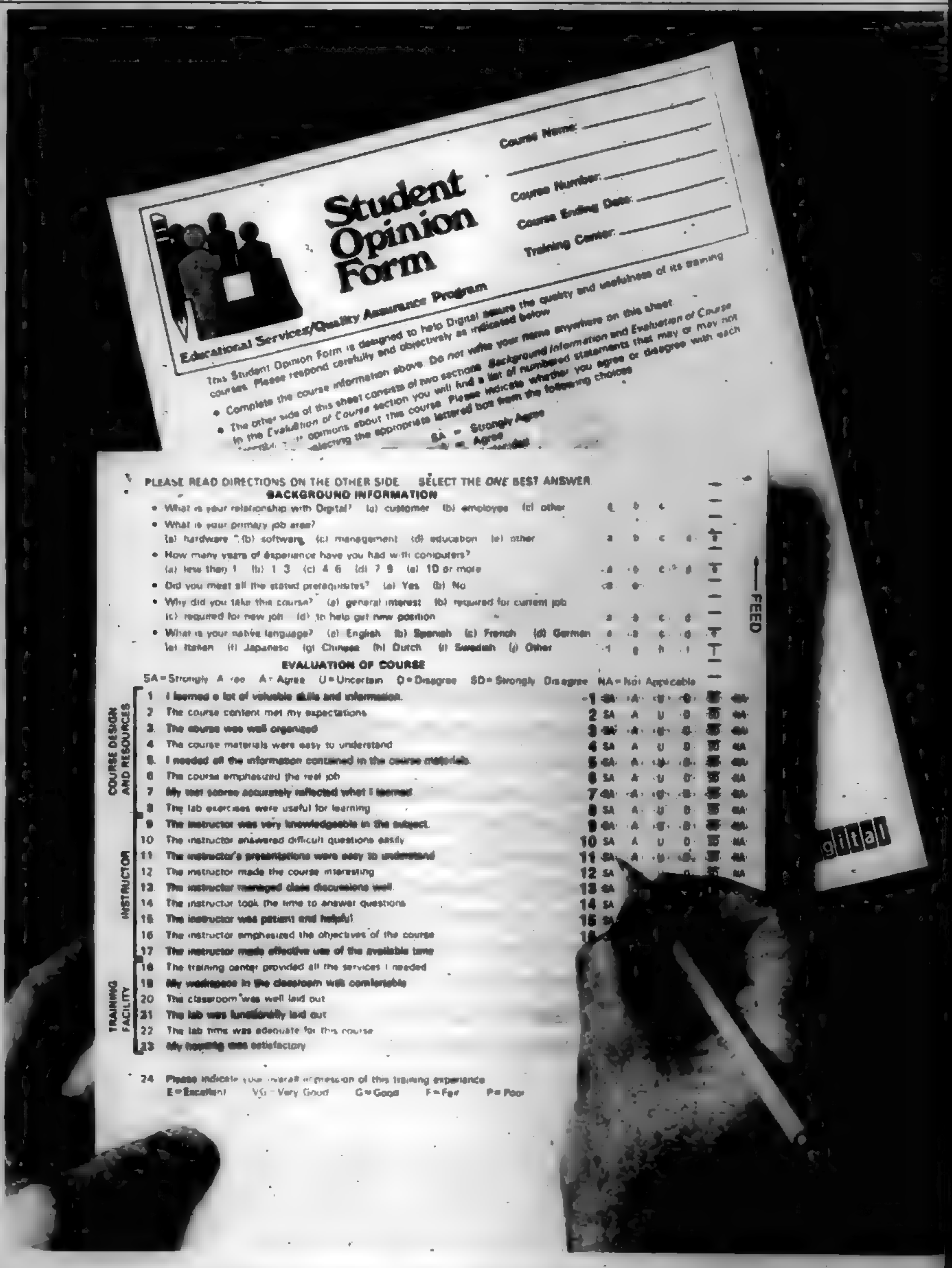
Micros Get Hard Disk Tools

CAMPBELL, Calif. — A series of hard disk subsystem products for microcomputers has been unveiled by Santa Clara Systems, Inc. (SCS).

The SCS Mini-Mega Fixed Removable products feature 5M bytes of storage capacity on a 3.9-in. removable Winchester cartridge along with a 5¼-in. fixed disk capacity of 5M, 10M or 15M bytes.

The system interfaces to several microcomputers, including the Apple Computer, Inc, Apple II and III, IBM's Personal Computer, the Radio Shack TRS-80 series and Motorola, Inc.'s 6800. Pricing on the subsystems ranges from $2,895 to $5,056.

SCS is based at 560 Division St., Campbell, Calif. 95008.



Student Opinion Form

Course Name:

Course Number:

Course Ending Date:

Training Center:

Educational Services/Quality Assurance Program

This Student Opinion Form is designed to help Digital assure the quality and usefulness of its training courses. Please respond carefully and objectively as indicated below.

- Complete the course information above. Do not write your name anywhere on this sheet.
- The other side of this sheet consists of two sections: Background Information and Evaluation of Course. In the Evaluation of Course section you will find a list of numbered statements that may or may not [illegible] opinions about this course. Please indicate whether you agree or disagree with each [illegible] selecting the appropriate lettered box from the following choices

SA = Strongly Agree

A = Agree

PLEASE READ DIRECTIONS ON THE OTHER SIDE SELECT THE *ONE* BEST ANSWER

BACKGROUND INFORMATION

- What is your relationship with Digital? (a) customer (b) employee (c) other
- What is your primary job area?
  (a) hardware (b) software (c) management (d) education (e) other
- How many years of experience have you had with computers?
  (a) less than 1 (b) 1 3 (c) 4 6 (d) 7 9 (e) 10 or more
- Did you meet all the stated prerequisites? (a) Yes (b) No
- Why did you take this course? (a) general interest (b) required for current job
  (c) required for new job (d) to help get new position
- What is your native language? (a) English (b) Spanish (c) French (d) German
  (e) Italian (f) Japanese (g) Chinese (h) Dutch (i) Swedish (j) Other

EVALUATION OF COURSE

SA = Strongly Agree A = Agree U = Uncertain D = Disagree SD = Strongly Disagree NA = Not Applicable

COURSE DESIGN AND RESOURCES

1 I learned a lot of valuable skills and information.
2 The course content met my expectations
3 The course was well organized
4 The course materials were easy to understand
5 I needed all the information contained in the course materials.
6 The course emphasized the real job
7 My test scores accurately reflected what I learned.
8 The lab exercises were useful for learning

INSTRUCTOR

9 The instructor was very knowledgeable in the subject.
10 The instructor answered difficult questions easily
11 The instructor's presentations were easy to understand
12 The instructor made the course interesting
13 The instructor managed class discussions well.
14 The instructor took the time to answer questions
15 The instructor was patient and helpful.
16 The instructor emphasized the objectives of the course
17 The instructor made effective use of the available time

TRAINING FACILITY

18 The training center provided all the services I needed
19 My workspace in the classroom was comfortable
20 The classroom was well laid out
21 The lab was functionally laid out
22 The lab time was adequate for this course
23 My housing was satisfactory

24 Please indicate your overall impression of this training experience
E = Excellent VG = Very Good G = Good F = Fair P = Poor

Boasts Job Costing, Payroll Applications

Data Collection, Control System Unveiled

SANTA CLARA, Calif. — Star Computer has unveiled a data collection and control system that can be used for job costing, payroll management, labor distribution and time accounting applications.

The Trans-Action systems are programmable, intelligent, microcomputer-controlled devices designed to capture data at the point of origin, store the information in memory and transmit the data to another station or host computer. The units have a 24-char. display and transmit to a variety of computers. Transmissions occur at speeds up to 9,600 bit/sec, a spokesman said.

Star Computer's Trans-Action

The systems can provide for either on-line or periodic batch transmission to the computer for data processing. Stations connected with the systems can reportedly automate and control security functions, turn on heat or lighting, control certain activities or lock and unlock specific doors.

The Trans-Action systems can include a 22-char. Hollerith badge reader, a magnetic stripe card reader, an 80-col. keypunched card reader or a bar code or optical character recognition wand scanner, a spokesman noted.

All data inputs are validated by programmed checks and edits in the stations. In addition, printouts of various conditions can be obtained at user-specific times, the vendor said.

The systems are priced at $1,995 each, with discounts available for large quantity purchases from the firm at 3080 Olcott St., Santa Clara, Calif. 95051.

Workstation Debuts; Features Color Graphics

NORCROSS, Ga. — Intelligent Systems Corp. has announced a color graphics workstation.

The Executive Presentation System (EPS) provides all the hardware and software users need to prepare presentation-quality, color graphics visuals including overhead projector transparencies, 35mm slides and paper prints and plots, the vendor said.

The EPS interactive graphics language reportedly allows users to create, modify, store and retrieve color graphs and charts; generate arcs, polygon fills, bars, zoom rotate and pan; choose from seven type fonts; write application programs without programming training, and build libraries of applications.

Priced between $18,000 and $30,000, the EPS is available from the vendor at 225 Technology Park/Atlanta, Norcross, Ga. 30092.

HP Laser Printer Gains Capability

PALO ALTO, Calif. — Hewlett-Packard Co. has announced its HP 2680A laser printer can now print on pressure-sensitive labels.

With the capability, users can extract information from their data bases and print labels to suit their needs. The unit can print labels that meet the requirements for various label formats including OCR-A. Labels can be ordered from various suppliers. Material requirements are defined in a specification list provided by HP.

Hardware that enables the HP 2680A laser printer to print labels is provided on new models at no extra charge. Current users can purchase a field upgrade kit for $500, HP said from 3000 Hanover St., Palo Alto, Calif. 94304.

Printer Buffers Introduced

CONCORD, Calif. — Renaissance Technology Corp. has announced a new series of printer buffers said to be compatible with a number of printers on the market.

Buff-et high-speed printer buffer reportedly can store up to 65,000 char. or about 30 average printed pages. The copy feature allows multiple copies of a document without having to resend it from the computer, the vendor claimed.

Power for the product can be taken from the printer power supply or from a common ac adapter. Buffer size is available in 16K, 32K or 64K bytes, according to the vendor. It can be purchased in both parallel and serial versions. A personal computer version contains all the cabling necessary to go directly between an IBM Personal Computer and a parallel printer.

This product ranges in price from $219 to $329, a spokesman said. Renaissance Technology is located at 1070 Shary Circle, Concord, Calif. 94518.

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Business System Emulates Intel's 8085 Microprocessor

NEWBURY PARK, Calif. — Voyager Systems, Inc. has announced the Voyager 4000, a small business system based on the Intel Corp. 8085 microprocessor.

The system comes with bundled software including Digital Research, Inc.'s CP/M operating system and word processing, spreadsheet with graphics, data base management, mailing list, payroll and executive time management packages.

A basic system combines two 5¼-in. double-sided, double-density floppy disk drives for a total of 1.2M bytes of disk storage and 64K bytes of main memory. The unit can be upgraded to an Intel 8086 microprocessor, and an 8/16-bit co-processor is available with 1K bytes of random-access memory, the vendor said.

A basic system costs about $5,000, the vendor said from 2192 Anchor Court, Newbury Park, Calif. 91320.

Fits IBM, Apple Micros

Tape Drive Series Released

SAN DIEGO — A series of ½-in. magnetic tape drives and intelligent controllers has been introduced here by Innovative Data Technology.

The Series 1012 Magnetic Tape Subsystem family of products was designed for use with IBM's Personal Computer, Apple Computer, Inc.'s Apple II and III, Commodore Business Machines, Inc.'s Pet and various other microcomputers, the vendor said. The subsystem reportedly provides personal and small business computers with the capability to read or write ½-in., nine-track magnetic tape.

The subsystem, which includes tape transport, formatter, intelligent controller, coupler, manuals, cabling and software, is priced at $6,995.

The vendor can be reached at 4060 Morena Blvd., San Diego, Calif. 92117.

DEC-Compatible Microsystem Out

NATICK, Mass. — Charles River Data Systems, Inc. has announced a Digital Equipment Corp.-compatible microsystem said to allow users to build a complete LSI-11 system, including processor, 256K bytes of memory and two disk drives.

The RLX1001B incorporates a 10.3M-byte, 5¼-in. Winchester disk; a 1M-byte, 8-in. floppy disk; a built-in DEC Q-bus card cage with 8-quad height slots and a 7-in.-high desktop or rack-mountable enclosure.

The RLX1001B costs $7500; With LSI-11/23 processor, 256K-byte memory and serial interface, it costs $9995 from the vendor at 4 Tech Circle, Natick, Mass. 01760.

OMR-2000 Gets Commodore Tie

CHATSWORTH, Calif. — Chatsworth Data Corp. has announced that its OMR-2000 optical card reader can now be attached to the parallel user port on Commodore Business Machines, Inc.'s microcomputers.

The OMR-2000 is an automatic card feed reader that can scan cards containing marks, punched or preprinted data, the vendor said.

The unit, including the new interface, costs $1,675, the vendor said from 20710 Lassen St., Chatsworth, Calif. 91311.

Matrix Printer Targets Minis

FORT LAUDERDALE, Fla. — Southern Systems, Inc. has announced a 140 char./sec printer system with a plotting format option.

The M-100 matrix printer offers output at 56 line/min when printing 132 char./line and 145 line/min when printing 40 char./line, the vendor said. The system reportedly is compatible with most minicomputers, including those from Digital Equipment Corp., Data General Corp., Perkin-Elmer Corp. and Burroughs Corp.

The system is ideal for bar codes, graphics, programmable character generator and block letters, according to the vendor. It costs $3,595, the vendor said from 2841 Cypress Creek Road, Fort Lauderdale, Fla. 33309.

Disk Drive Fits S-100 Computers

NATICK, Mass. — Alloy Computer Products, Inc. has announced an 8-in., 45M-byte Winchester disk drive designed for S-100 computers.

Micromate features a built-in 13.4M-byte cartridge for backup. Both disk and cartridge drives are driven by a single power supply. The other major system component is the interface linking the drives to an S-100 computer.

The system is said to provide high-speed, file-oriented disk-cartridge transfers at a rate of .5M byte/sec. Micromate uses Micropolis Corp.'s Model 1223 disk drive and costs $5,495 from Alloy Computer at 12 Mercer Road, Natick, Mass. 01760.

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Since data communications are becoming more and more important in computer operations, *Computerworld's* Special Report is being designed to wrap up both long and short haul Data Communications Networks for you. You'll get a close look at the communications explosion and how users are trying to harness it.

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- Combining private and public switch data networks
- Designing and using national multi-user and multi-function networks
- Network management technologies and how they have evolved
- Teleprocessing system performance
- Telecommunications and DP managers

And since virtually all aspects — planning, installation, operations, network control and cost accounting — of Data Communications are affected by deregulation, you'll get lots of coverage of deregulation and its impact on users.

If data communications are affecting — or beginning to affect — what you do, then you can't afford to miss this Special Report.

And if you sell network products, here's where you'll find your best prospects on January 31st — reading *Computerworld's* Special Report on Data Communications Networks. Your ad in this issue will insure them more complete information on the products in the field. Ad close for this Special Report is January 14th.

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System Brings Direct Mail Ability To Ecom Service

STERLING HEIGHTS, Mich. — D.L. Hiller & Associates has unveiled an electronic mail software system said to provide direct-mail capability to the U.S. Postal Service (USPS) Electronic Computer-Originated Mail (Ecom) service.

Ecom is the USPS service that accepts single-address letters and form letters for distribution electronically. Ecom users enter their correspondence and direct-mail letters into their word processors and/or computers. They can transmit their mail to USPS Ecom computers, where the letters are printed and delivered within one to two days.

The Electronic Postman package makes such communication of mail from computers possible. It generates and transmits the mail for Ecom users, resulting in secretarial and clerical labor savings of 40% to 55% over conventional mailing approaches, the vendor claimed.

The package can operate on most personal computers, minicomputers and mainframes that are equipped with word processing capabilities. It has been certified by USPS.

Turnkey hardware and software systems start at $6,000 for small business use and increase in cost with larger systems. Software-only versions are $1,695, and a demonstration version with documentation costs $95, D.L. Hiller said from 14536 Island Drive, Sterling Heights, Mich. 48078.

Planet Token Ring Series Unveiled by Racal-Milgo

MIAMI — Racal-Milgo, Inc. has unveiled a local-area network product line running over coaxial cable in a "twin ring."

The Planet Token Ring series can be configured to meet a variety of applications. It permits full- or half-duplex communications and accommodates communicating devices from different vendors, regardless of protocol, Racal-Milgo claimed. It is said to be particularly suitable for an office or factory complex where multiple independent systems must operate in a totally protocol-transparent environment, according to a spokesman for the firm.

Each Planet Token Ring series can accommodate up to 500 communicating devices such as word processors, terminals and other DP equipment. The communications link is controlled by the Planet Director, a compact, desktop intelligent network processor. Systems interface is provided by Terminal Access Points (TAP).

Network of TAPS

A network of up to 250 TAPs can be monitored and controlled by one director. Each TAP has two RS-232 ports that can operate synchronously, asynchronously or mixed at speeds to 19.2K bit/sec. A TAP can be attached at any Cable Access Point (CAP) along the cable length, allowing communications devices to be plugged in like ordinary electrical appliances, the vendor said.

Planet can support any combination of conventional circuit plans — point-to-point, multidrop or broadcast — in a permanent or switched mode, working simultaneously, the vendor claimed. Dedicated and switched circuits can reportedly be established by a few English-language commands.

Virtually any terminal workstation or other communicating device can be connected to any other compatible device or group of devices. Network expansion is accomplished by adding more TAPs. Additional CAPs can also be installed at any time, anywhere along the cable, without interrupting the flow of communications, the vendor noted.

A fail-safe mechanism reconfigures the Planet, bypasses the problem and reestablishes the communications link automatically in the event of a cable fault. In addition, the system features diagnostic aids, network control features and a range of management capabilities.

Each director costs $9,450 and each TAP costs $2,250. They also lease on a 36-mo agreement for $342 and $82/mo, respectively. Racal-Milgo can be reached at 8600 N.W. 41st St., P.O. Box 520399, Miami, Fla. 33152.

Honeywell CPUs Get Micro Facility

PHOENIX — Honeywell, Inc. has introduced a personal computing facility for its mainframes that was designed to automate various office functions.

The software package is also said to be a productivity aid in forms creation.

The facility is a screen-oriented subsystem of Honeywell's time-sharing system that operates on the vendor's 66/DPS or DPS/8 mainframe running Gcos or Gcos 8.

The package allows users to automate their office procedures without the assistance of a professional data processing staff, a vendor spokesman said. It was designed to create forms on a CRT screen as a basis for interactive problem solving or report generation.

The package supports Honeywell's VIP 7700/7800 family of terminals and is available for a monthly license fee of $170 with a minimum term of 12 months. Honeywell can be reached through P.O. Box 6000/T-60, Phoenix, Ariz. 85005.

Multivendor WP Tool Released

KING OF PRUSSIA, Pa. — Integrated Technologies, Inc. has announced a distributed software product that reportedly provides multivendor word processor compatibility.

Soft-Switch enables word processors of different types to share documents without sacrificing the ability to edit the documents, the vendor said. Documents created on one brand of word processor that are used by another are first converted to Soft-Switch's own proprietary canonical form and then translated into the proper form for the recipient processor. All format codes are preserved and the document can be edited or printed immediately upon receipt without the need to perform document cleanup, according to the vendor.

Current Soft-Switch interfaces are available for the IBM Displaywriter, IBM OS6, IBM 6640 and 6670, Wang Laboratories, Inc. OIS, VS and WPS systems. The cost for the mainframe software is $15,000 and each interface is $3,000.

The firm is located at Suite 414, 200 N. Warner Road, King of Prussia, Pa. 19406.

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DEC Offers Four Packages For VAX-11/750, /780 Users

MAYNARD, Mass. — Digital Equipment Corp. has introduced four software packages that are said to offer users of VAX-11/750 and VAX-11/780 minicomputers efficient on-line storage.

The packages are based on two of DEC's recently introduced disk products, the RA8 fixed medium disk drive and the RA60 removable disk drive.

The disk subsystems are part of DEC's All-In-One office systems and give improved on-line storage for typical office applications that involve multiuser work loads, large numbers of records and high levels of use for electronic mail, a vendor spokesman said.

Prices for the four packages range from $168,300 to $318,600, DEC said from Maynard, Mass. 01754.

TO-5000 Gets Underscore Feature

NORTHRIDGE, Calif. — An underscore recognition capability has been announced by Mitsui/Totec U.S.A. for use with it: Mitsui/Totec TO-5000 optical character recognition (OCR) system.

With this feature, reportedly both single-word and continuously underscored information can be scanned, digitized, then automatically transferred to a WP/DP system.

The TO-5000 is a desktop, multifont OCR system that is capable of reading as many as six type fonts without manual interchange. Its high-speed throughput capacity reportedly allows 300 pages to be read per hour.

The standard configuration is available for $13,990. The vendor is located at 19151 Parhenia Ave. "A", Northridge, Calif. 91324.

Daisywheel Printer Boasts 55 Char./Sec

STAMFORD, Conn. — Digital Associates Corp. has introduced a daisywheel printer that reportedly prints at 55 char./sec and has a mean time before failure of 3,000 hours.

The DP-55 features 100 font styles in both plastic and metal printwheels, column/status display and universal power display. It also features an expandable programmable memory, a vendor spokesman said.

Optional features reportedly include cut-sheet feeder, tractor-feed paper and bottom-feed paper slot. Compatibility with IBM, Digital Equipment Corp., Data General Corp. and other major computers is available.

The printer ranges in price from $2,000 to $2,500 and is available from Digital Associates Corp., 1039 E. Main St., Stamford, Conn. 06902.

Sony Announces Compact Printer

NEW YORK — Sony Office Products, a division of Sony Corp. of America, has introduced a companion compact printer to its Typecorder Portable Office System. When used in combination, the two units produce hard copy at home in the office or on the road, the vendor claimed.

The Sony Compact Printer Model OA-P1110 weighs five lb, 12 oz and accepts standard 8½-by-11 in. paper. It prints at 17 char./sec on plain paper. The characters are made from a 24-by-32 dot matrix and the user can select a 10- or 12-char./in. pitch.

The printer is available for $825 from Sony Office Products, 9 W. 57th St., New York, N.Y. 10019.

Micromation Adds WP System

SAN FRANCISCO — A small business word processing system was announced by Micromation, Inc.

Miword allows a multifunctional workstation to perform word and data processing, telecommunications and other information management tasks. Users can create, edit, print and file documents with a full range of formatting capabilities, the vendor said. Miword has self-explanatory function keys and a fully operational cursor movement keypad.

The system can be purchased as part of a Micromation business computer system or can be added to Micromation systems already in use. Priced at $595, Miword is available from the vendor at 1620 Montgomery St., San Francisco, Calif. 94111.

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To Benefit Both Firms

IBM Buy-In of Intel Called Industry Coup

By Bill Laberis
CW Staff

IBM's proposed acquisition of 12% of Intel Corp. is, in the words of one industry analyst, "great for IBM, great for Intel and bad for the Japanese."

Moreover, industry observers said, the intended acquisition may send other American semiconductor manufacturers seeking similar financial arrangements with big computer makers in order to secure research and development funds and remain competitive.

Announced Dec. 22, the IBM-Intel agreement calls for IBM to purchase 6.25 million new shares of Intel stock for $40 per share, or $250 million total. Analysts said this price is anywhere from 10% to 20% more than Intel would have garnered via a public stock offering.

"I wouldn't exactly call it a subsidy, but that offering would not have made $40 on the open market, not with the way things are for the semiconductor makers," said Mike J. Geran, industry analyst at E.F. Hutton & Co., Inc. in New York.

Geran said the deal is a sweet one for IBM in that "Intel is the technology leader in the products IBM is most interested in."

Intel, meanwhile, will become the beneficiary of twice the amount of money it laid out for capital expenditures during all of 1982, Geran noted, "easing a recession-induced cash flow problem that has really socked the semi manufacturers."

"Intel needs this kind of support to compete with the Japanese," Geran said. "It will be interesting to see how its American competitors will react."

Additionally as per the agreement, IBM will limit any future Intel stock purchases to 30% of the total outstanding. This future purchase option, coupled with the ownership of over one-third of Intel's stock by company employees, should all but negate the possibility of an unfriendly takeover of Intel.

The agreement also provides for the election to Intel's 11-member board of an IBM nominee, who will be excused from deliberations in which there is a potential conflict of interest, IBM and Intel have said.

The agreement and minority purchase must be approved by federal regulatory agencies. Approval, analysts said, is virtually assured both by the restrictive language of the agreement and the conclusion last year of the government's antitrust suit against IBM.

The end of that long suit "removed one potential obstacle in the path of this sort of

(Continued on Page 66)

Supreme Court Decision Seen As Win for Software Houses

By Paul Gillin
CW Staff

WASHINGTON, D.C. — In a move hailed as a victory for software developers, the U.S. Supreme Court has refused to review a ruling by the Wisconsin Supreme Court that found the accounting firm of Arthur Young & Co. guilty of stealing trade secrets from M. Bryce Associates, Inc., a Cincinnati-based information processing firm.

Bryce's suit charged that the accounting firm had published information supplied by Bryce during a demonstration of a management information system (MIS) methodology in 1974. Bryce argued that the information was protected by state trade-secret laws, even though some of the documentation carried a copyright notice. Copyright law protects the form but not the underlying ideas of a work, while trade-secret laws protect the concepts.

Lawyers for Arthur Young argued that Bryce had forfeited its trade-secret protection by placing a federal copyright notice on the materials. The firm argued it was illegal for Bryce to seek protection under both copyright and trade-secret laws. Arthur Young also contended that Bryce's methodology was publicly available and, as such, did not constitute a trade secret.

The $10,000 suit was filed in a Wisconsin circuit court in 1974 and attracted considerable attention from software developers and parties concerned about

(Continued on Page 68)

Called Father of Silicon Valley

Ex-Stanford's Terman Dead at 82

Fred E. Terman

By Robert Batt
CW West Coast Bureau

PALO ALTO, Calif. — Frederick Emmons Terman, former provost at Stanford University and a man often called the "Father of Silicon Valley," has died at the age of 82.

Terman, who succumbed to a heart attack during the holiday season, is best remembered for his role as a driving force in the development of the electronics industry on the West Coast.

Among his students were David Packard and William Hewlett, co-founders of the Hewlett Packard Co., and Edward Ginzton, chairman of Varian Associates.

Terman had a profound influence on

(Continued on Page 70)

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OA Budgets to Increase Just 20% This Year: IDC

FRAMINGHAM, Mass. — Although users will spend more on office automation this year compared to last year, the rate of increase in spending will drop significantly, reflecting recessionary pressures, according to a report released by International Data Corp. (IDC).

"User Spending in Office Automation" predicts an increase in office automation budgets for 1982-1983 of 20%, compared to a 56% increase the previous accounting year.

The report is based on the results of both a mail questionnaire survey and a series of interviews with companies in both the public and private sector.

As expected, hardware was by far the largest budget item, accounting for at least half of office automation budgets, according to the report.

Also, an overwhelming majority of respondents indicated that office automation responsibility was located within the data processing or management information services department, with larger organizations more prone to allocate responsibility in this manner, the IDC report said.

Less than half the organizations sampled indicated they had a comprehensive office automation plan, and there seemed to be no correlation between overall size of the organization and the presence of such a plan, IDC said.

The report is available for $3,500 from IDC, 5 Speen St., Framingham, Mass. 01701.

Intel Acquisition Seen Sweet for IBM, Intel

(Continued from Page 65)

agreement," according to Harry Edelson, vice-president of research at the First Boston Corp. On the contrary, federal regulators may look upon the deal between two American companies as being in the best national interest, given the industry threat posed by the Japanese, Edelson said.

"It assures IBM a U.S. rather than a Japanese supplier (of semiconductors), which is good for IBM when you consider the Japanese may end up being IBM's biggest competitor," Edelson said.

John R. Opel, president and chief executive officer of IBM, said his company will not participate in the day-to-day operations of Intel and that IBM will "continue making significant (semiconductor) purchases from other manufacturers, as well as Intel."

Dr. Gordon E. Moore, chairman and chief executive officer of Intel, said, "We welcome IBM's investment. It will permit Intel to continue the investment in research and development and production capacity necessary to retain leadership in microelectronics."

Just a week before the agreement was announced, Intel had released an official statement denying that the company had engaged in merger and acquisition talks with IBM, despite persistent rumors to the contrary. The agreement also followed by a few weeks an announcement that Intel would cut by up to 10% the wages of many of its 16,000 workers worldwide, an austerity move designed to fight the anemic profits that have plagued the semiconductor industry.

Last September, Intel forged an agreement to provide IBM with all circuitry, masks and process technology for the 64K-byte Intel 2164A random-access memory chip. Intel also supplies the microprocessors for IBM's Personal Computer, Displaywriter word processor and Datamaster small business computer.

Acknowledged by many observers as a technology leader, Intel has been rocked for the past two years by a combination of the recession and fierce price competition initiated by the Japanese manufacturers.

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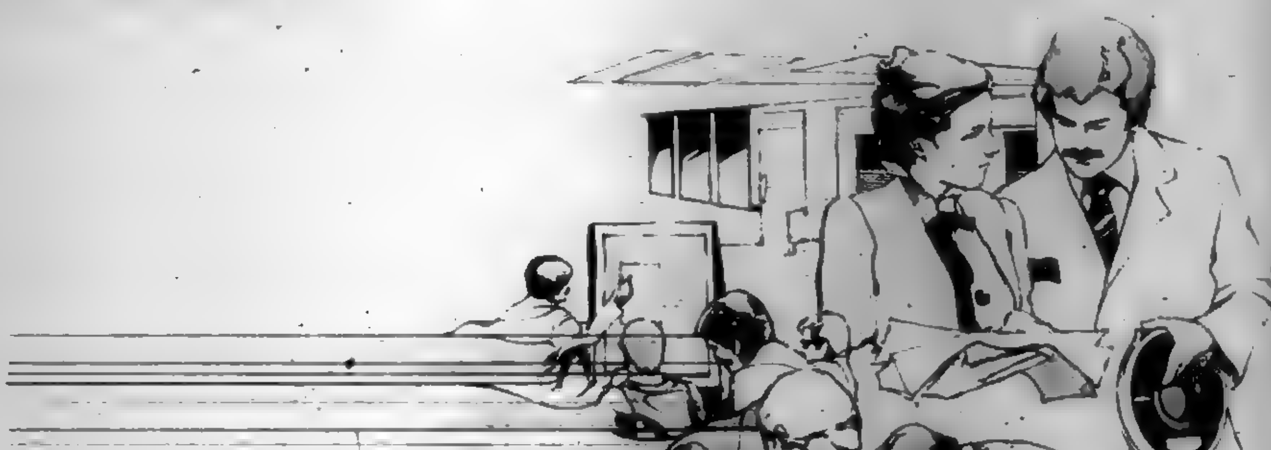

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Leasing Funds Available: Dealers, Financiers

By Bob Johnson
CW New York Bureau

NEW YORK — Contrary to some gloomy predictions about the disappearance of funds for financing computer leasing deals, financial institutions and dealers contacted here are saying that money is available and they are experiencing "business as usual."

Jim Kelly, vice-president at Citicorp Industrial Credit, Inc. (CIC) in New York, said in a telephone interview that although DP managers may be becoming apprehensive about leasing deals because of the apparently bleak financing climate, his company is "actively pursuing" this business. Third-party leasing, he said, is as healthy as ever.

"We are continuing to talk to major manufacturers in the computer, minicomputer and peripheral areas. There are virtually no restrictions on funding — financial institutions like ours have a commitment to this industry," he said.

Kelly claimed there are a number of alternative financing methods available to users. Under third-party vendor leasing programs, for example, the financing company will handle all of the leasing details for users who want to lease a manufacturer's purchase-only hardware. Kelly said this kind of program is being successfully employed in leasing all types of hardware, including office automation equipment and mainframes. CIC struck a similar agreement with IBM earlier this year, he noted.

Echoing Kelly's sentiments on the availability of leasing funds was Ted Daleiden, senior vice-president of the Equipment Lease and Finance Division of Chase Commercial Corp. (CCC) in Englewood Cliffs, N.J. Daleiden said the third-party leasing business was slower in 1982 than it was in 1981, but that the reason for the doldrums is the recession, not the lack of funds to swing deals.

"We booked about 20% less in '82 than '81 in the third-party lease area, but that's because the economy has impacted companies' ability to buy, lease or sell equipment," Daleiden remarked.

Conservative Institutions

A reason that the financing picture may appear bleak, according to Daleiden, is that financial institutions are acting more conservatively when approving credit for leasing deals. He said that leasing delinquencies, write-offs and losses were higher in 1982 than in previous years. As a result, some more risky deals, which would have probably been approved last year, were denied in 1982.

"Everyone is looking at third-party leasing paper [contracts] more closely now," Daleiden said.

Paul Luftig, president of the Great Oxford Commercial Ltd., a leasing firm in New York, said that full payout leasing deals, where the user takes the full risk, are prospering. "The problem is not in the availability of financing, but the number of transactions being made," he said. "The economy is hurting the number of deals, and users' credit is watched very carefully by financial institutions in this kind of economic climate," he said.

Luftig also held that third-party leasing deals require financial institutions to do a lot of marketing to vendors and customers.

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Voice Notes Announced

SUNNYVALE, Calif. — Centigram Corp. has announced four applications notes that detail applications for the company's Voiceware Development System, Lisa speech output device and Vopac speech digitizer.

The notes are titled "Applications of Digital Speech Technology: The Voice of Alarm"; "Making Mail Talk"; "Helping People Learn"; and "Voice Output via [AT&T's] Touch-Tone."

For information on ordering the free application notes contact Centigram Corp., 1153 Bourdeau, Sunnyvale, Calif. 94086.

M/A-Com Gets Reorganized

GERMANTOWN, Md. — Jack A. Shaw, president and chief executive officer of M/A-Com DCC, Inc., announced a companywide reorganization, effective immediately.

Appointed to various posts within the company were: Pradman Kaul, senior vice-president; J. Lou Peeler, senior vice-president and corporate secretary; Andrew M. Werth, senior vice-president of Satellite Communications Group; Pradeep Kaul, senior vice-president of engineering; Jay Justed, vice-president of Satellite Communications Group; Larry Campbell, vice-president of Lightwave Communications; James Lucchese, vice-president of finance and treasurer; William Kaht, vice-president of human resources and administration; J.S. McClanahan, vice-president of operations; Sheldon B. Revkin, assistant vice-president of Data Communications Group; and Dan Fraley, assistant vice-president of hardware development.

M/A-Com is at 11717 Exploration Lane, Germantown, Md. 20874.

For Info on Bombing

IBM Offers $50,000 Reward

NEW YORK — IBM has offered a $50,000 reward for information leading to the arrest and conviction of those responsible for the bombing of a company office building in Harrison, N.Y., on Dec. 16.

A group calling itself the United Freedom Federation claimed responsibility for the bombing and for a blast at a South African Airways purchasing office in Elmont, Long Island, the same day, the Federal Bureau of Investigation said. No one was injured in either explosion.

The bomb, placed outside the IBM building, caused extensive damage, with an explosion that was heard up to five miles away. The building had been evacuated minutes before the blast, following an anonymous tip received at a local newspaper.

The FBI New York City Police Department Task Force to Combat Terrorism is investigating the incidents. No new information has been received about the bombings.

Stanford Forms Software Center

PALO ALTO, Calif. — Stanford University has announced the formation of the Software Distribution Center (SDC) to help distribute the scientific programs developed at the school and then sold to end users.

The center's purpose is to enable the programs to be widely distributed without their developers getting bogged down assisting program users. In the past, the university would license a company to distribute and support its software, with a Stanford scientist then working with the buyer to iron out program bugs.

More information is available from Bill Osborn at Stanford University, Stanford, Calif. 94305.

Young Ruling Denied Review

(Continued from Page 65)

possible competition from public accounting firms offering DP services.

Bryce alleged that it demonstrated its MIS methodology, called Pride, to Arthur Young and its client, Harley-Davidson Motor Co., Inc., in 1974. At that time, representatives from Arthur Young signed a nondisclosure statement, the suit stated. Bryce alleged that shortly thereafter, Arthur Young used the Bryce methodology to supply the same kind of services to Harley-Davidson.

In a ruling last year, the Wisconsin Supreme Court held that Bryce's voluntary use of the copyright notice did not cancel the trade-secret status of its methodology.

"The benefit of this to software developers is that it says the commercially valuable part of your program is protected by state trade-secret laws," said Ron Palenski, assistant general counsel at the Association of Data Processing Service Organizations, Inc. "The court is saying that, yes, trade-secret and copyright protection may coexist."

Bryce said that although its manuals bore the copyright symbol, it never formally applied for copyright protection. "According to law, if you ever hope to copyright anything, you have to use that symbol," Milton Bryce, president of the company, said. "Just because some of our papers had a copyright symbol doesn't mean it's published material."

However, a lawyer for Arthur Young called Bryce's victory "hazardous," saying the decision did not conclusively state that copyright and trade-secret protection may coexist.

"The American Bar Association Trade Secret Committee has indicated that one should not publish documents with the copyright code and expect trade-secret protection," Gene Erbstoesser, an assistant general counsel for Arthur Young, said. "These findings are by no means conclusive."

Bryce said he has been deluged with calls from software firms interested in protecting their products. "I tell them to do two basic things," he said. "Get a nondisclosure agreement and ensure that the contract with the customer includes a statement that the information is a trade secret and is not to be revealed to a third party."

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EQUALS:

Executive Corner

• Charles J. Graham has been elected vice-president, business systems, of Continental Telecom, Inc.

• Dr. Jeffrey Krauss has been named vice-president and director of corporate affairs and K. Paul Singh has been appointed assistant vice-president of corporate strategic planning at M/A-COM Development Corp., Rockville, Md., an operating company of M/A-COM, Inc.

• Thomas B. Holmes has been named vice-president, editorial and James P. Murray vice-president, planning and development, for Datapro Research Corp.

• Roger C. Ferguson has been elected vice-president and controller of General Instrument Corp.

• Larry Jones has been appointed vice-president of systems development for Micro Data Base Systems, Inc.

• Keith H. Schonrock Jr., James F. Taylor Jr., Nancy B. Meadlock, Robert E. Thurber, John M. Thorington Jr., Ronald W. Brown, Allan B. Wilson and William D. Zarecor have been named executive vice-presidents of Intergraph Corp. Richard H. Lussier has been appointed vice-president, national sales; William T. O'Meara, vice-president, customer engineering; and Robert S. Williams, vice-president, operations, for the firm.

• Dr. Dennis C. Nystrom has been named president and chief operating officer of Hansford Data Systems, Inc., Rochester, N.Y.

• Gary E. Liebl, president of Microdata Corp., has taken on the additional responsibilities of chief executive officer (CEO) following the resignation of Donald W. Fuller as chairman and CEO. John McDonnell, president of McDonnell Douglas Corp., the parent company of Microdata, has assumed the chairmanship of Microdata.

• David R. Fernald has been appointed vice-president, marketing, for Datapoint Corp.'s Office and Computer Products Group.

• Gary L. Tooker, vice-president of Motorola, Inc. and general manager of the firm's Semiconductor Products Sector, has been elected a senior vice-president.

• Jerry Uden has been named vice-president of marketing and sales at Computer Composition International, Encino, Calif.

• Surinder S. Brar has been promoted to the newly created position of vice-president of business development for North Star Computers, Inc.

• Thomas S. Stevens has been appointed president of Memorex Corp.'s Media Products Group.

• David N. Martin has been appointed president of National Advanced Systems, Inc., a subsidiary of National Semiconductor Corp.

• James E. Grinnell has been named president of Distribution Management Systems, Inc.

• Robert L. Doretti has been named group vice-president, U.S. Operations, for Wang Laboratories, Inc.

• Robert A. Degan, president and chief operating officer of Applied Digital Data Systems, Inc., an NCR Corp. subsidiary, has been appointed chief executive officer of the firm.

• Gary L. Tooker, vice-president of Motorola, Inc. and general manager of the firm's Semiconductor Products Sector, has been elected a senior vice-president of the company.

• Pierre Gunnoe has been named director of technical operations for Execucom Systems Corp.

• John Elliot has been promoted to president of Automatic Data Processing, Inc.'s Electronic Financial Services Division.

• Richard Barton has been appointed vice-president, division manager, and Robert Hooper has been named vice-president, marketing, for Anderson Jacobson, Inc.'s Integrated Office Systems Division.

IBM Leader Dead at Age 71

BOYNTON BEACH, Fla. — The man who headed IBM in the early 1960s during the development of the 360 mainframe and spent 45 years in the employ of the company has died following a long illness.

Albert L. Williams, who was 71, joined IBM in 1936 as a salesman, moving rapidly to the controller's slot six years later. He was elected treasurer in 1947, vice-president and treasurer in 1948 and was appointed to the board of directors in 1951.

Williams was named executive vice-president in 1954, and assumed the presidency in 1961, a position he held for five years. He retired from this post and was elected chairman of the executive committee in 1966. He resigned as chairman of the committee in 1971 and was immediately elected chairman of the newly created finance committee of the board of directors, a position he held until 1978. He retired from that board and was then elected to membership on the IBM Advisory Board.

In 1970, Williams was appointed by former President Nixon as chairman of a 27-member citizens commission on international trade and investment policy. He also served on several boards, including those of the Mobil Corp., Eli Lilly and Co., General Motors Corp., General Foods Corp. and Schroeder Bank and Trust.

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Nickels & Dimes

Timeplex, Inc. has filed a registration statement with the Securities and Exchange Commission covering 1.1 million shares of common stock. Montgomery Securities heads up the underwriting group.

$ $ $

Scientific Systems Services, Inc., Melbourne, Fla., has completed a private placement of $3.8 million of common stock. The shares were sold on behalf of the company and certain selling shareholders to a group of U.S. and foreign investors.

$ $ $

Applied Micro Circuits Corp. has raised $2.25 million through the sale of convertible debentures. Participants in the financing included U.S. Ventures; Robertson, Colman, Stephens & Woodman; International Industrial Investments, Inc.; Olivetti Corp.; and venture funds managed by Frederick Adler.

Penril Corp. has reported net earnings per average share were up 25% for the first quarter of fiscal 1983, which ended Oct. 31, 1982.

Bolt, Beranek and Newman, Inc. has declared a semiannual dividend of 14 cents per share, payable March 1.

'Father of Silicon Valley' Dies at Age 82

(Continued from Page 65)

the whole field of electronic engineering," recalled Hewlett. "He was the professor that influenced us to go into business."

During a 40-year career at Stanford beginning in 1925, Terman became the dean of engineering and then provost, the second-ranking academic post at the university. He was a founding member of the National Academy of Engineering, and in 1976, former President Ford awarded Terman the National Medal of Science. The following year, Stanford dedicated its new $9.2 million Terman Engineering Center.

Stanford President Donald Kennedy commented: "Much of what Stanford is, it owes to Terman's extraordinary vision."

That vision began at an early age. Born in 1900 in English, Ind., Terman was the son of Lewis M. Terman, the psychologist who developed the so-called Stanford-Binet intelligence quotient. The two Termans became one of the few father-son combinations elected to the National Academy of Sciences.

Because of his father's belief in Rousseau's notion of natural education, young Fred was not sent to school until the age of nine, when he learned to read and qualified for the third grade. He entered high school at age 13, and graduated from Stanford at age 20 with a bachelor's degree in chemical engineering. In 1924, he earned his doctorate at MIT.

Tired of the brain drain of students from Stanford to the eastern part of the U.S., Terman began to take a direct hand in encouraging local industry. "Small business always interested me," Terman once said, "so I helped five or six of my students establish companies of their own. I assisted with encouragement, advice and ideas."

Following a suggestion by Terman, William Hewlett designed and built an audio oscillator, a device that generates signals of varying frequencies. Together they enticed David Packard, a 1934 graduate, to return from General Electric Co. to start a business in Packard's garage. It has now turned into the multibillion-dollar worldwide corporation that bears their name.

During World War II, Terman moved to Harvard University where he organized a radio research laboratory devising jammers for enemy radar and made tunable receivers for detecting and analyzing enemy radar signals.

"The war made it obvious to me that science and technology are more important to national defense than masses of men. The war also showed how essential the electron was to our type of civilization. Our method of fighting the war was, to an amazing degree, built around and determined by electronic devices," Terman said.

Returning to Stanford as dean of engineering in 1946, Terman began building its reputation as a nationally recognized research center. He began to foster what Hewlett termed "a sort of symbiotic relationship between industry and the university."

Terman was instrumental in opening up Stanford's classrooms to academically qualified industry engineers. He started the honors cooperative program in 1953-1954, enabling engineers to sit in classes directly or via a television network in their companies. Industrial affiliates programs started and corporate gift support rose steadily.

By 1974, Santa Clara County enjoyed what *Fortune* magazine termed "the densest concentration of innovative industry that exists anywhere in the world," with more than 800 pioneering high-technology firms. This, claimed *Fortune*, was almost wholly the handiwork of Frederick Terman.

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Orders & Installations

Computer Sciences Corp. has received two contracts totaling more than $16.4 million from the National Aeronautics and Space Administration for continued operation of the Explorer satellite and support to the Mission and Data Operations Directorate at Goddard Space Flight Center, Md. The firm has also been awarded a $38.3 million contract by the U.S. Navy to supply a standard automated financial system to 14 naval research laboratories.

Ultrasystems, Inc. has been awarded an $8 million contract by the U.S. Army Electronic Proving Grounds for support in testing tactical command, control, communications and intelligence systems.

Priam Corp. will supply Plantronics Zehntel, Walnut Creek, Calif., with an undisclosed number of 8-in. Winchester disk drives under a recently signed $1.5 million contract.

Universal Communications Systems, Inc. has been awarded a $5.4 million contract by American Electric Power Services Corp., a subsidiary of American Electric Power Service Corp., for installation of computerized telephone equipment in Columbus, Ohio; Canton, Ohio; Roanoke, Va.; and Fort Wayne, Ind.

Disctron, Inc., a subsidiary of Computer & Communications Technology Corp., has received a $4 million contract from Durango Systems, Inc. for 10M- and 20M-byte disk drives for use in Durango's F-85 small business computer.

Corona Data Systems, Inc. has been awarded an $8 million contract by High Technology Distribution of St. Louis, for its IBM Personal Computer-compatible personal computers.

Cybertek Computer Products, Inc. has received a five-year contract extension for data processing services from Republic-Vanguard Life Insurance Co.

Honeywell, Inc. has received an order from Camden County, N.J., for a DPS 8/20 computer valued at $1 million.

GTE Business Communications Products Group has been awarded a contract valued at approximately $4.5 million by Pacific Gas & Electric for two digital GTD-4600E private automatic branch exchanges.

Sperry Univac has received orders for its System 80 computer from Analog Devices, Inc.'s Computer Laboratories Division, Greensboro, N.C.; the City of Lynn, Mass.; Wansbeck District Council, Charnwood Borough Council and Wilkinson Transport of the UK; and Queensland State Stores Board and George Ward Distributors Pty., Ltd., Australia.

Paradyne Corp. has received an order from Ford Motor Co. of Canada for its Pixnet communications network and Response distributed data processing system. The order is valued at over $7 million.

Prime Computer, Inc. has received a $2.5 million order from Paychex, Inc., Rochester, N.Y., for 35 Prime systems, a combination of 250-11 and 2250 superminicomputers.

Ithaca Intersystems, Inc. has been selected by the state of New York as one of three approved vendors to sell microcomputer systems to state agencies. The award has a potential value of more than $2.2 million.

Digityne Corp. has been awarded a $2.4 million contract by Combined Computer Language for a minimum of 200 minicomputer systems.

Computer Composition International (CCI), Encino, Calif., has received an order for eight CCI front-end systems from Harcourt, Brace & Jovanich Publications, Duluth, Minn.

Sigma Software, Inc. will install its computer programs in 47 branch offices of Home Life Insurance Co. of New York.

System Development Corp. has been awarded a $45.9 million contract by the Environmental Protection Agency to provide facility management support for the EPA Data Processing Services Center.

Allied Telephone Co.'s Allied Telecommunications Systems subsidiary has been awarded a $2.5 million contract to provide a telecommunications system for Trust Co. of Georgia.

Datapoint Corp. has received a $1.5 million order for automated office equipment from the Federal Intermediate Credit Bank, Sacramento, Calif.

Planning Research Corp. has been awarded a one-year, $4.9 million extension of its contract for software development and support from the U.S. Navy Electronic Systems Command.

Burroughs Corp.'s Federal and Special Systems Group has been awarded a $3.2 million contract by the U.S. Postal Service (USPS) for 120 Expanded Zip Retrofit kits to be used in modifying the USPS's multiposition letter-sorting machines.

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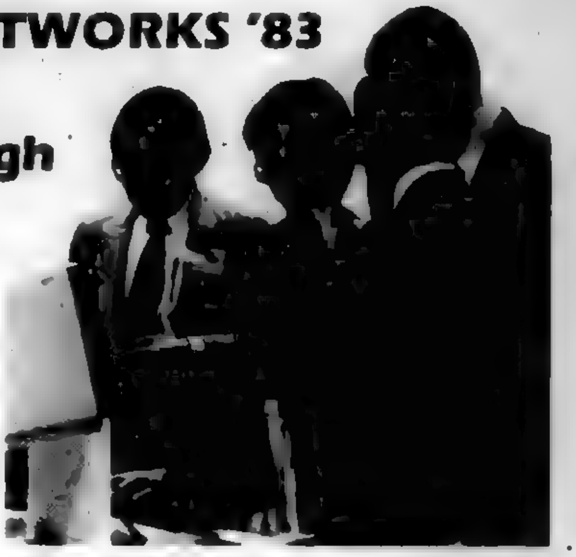

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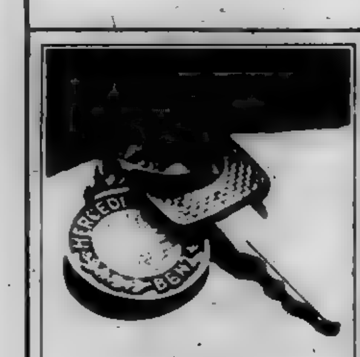

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IN NC (919) 484-4101

NATIONWIDE
PERSONNEL SERVICE, INC.
P.O. Box 35825
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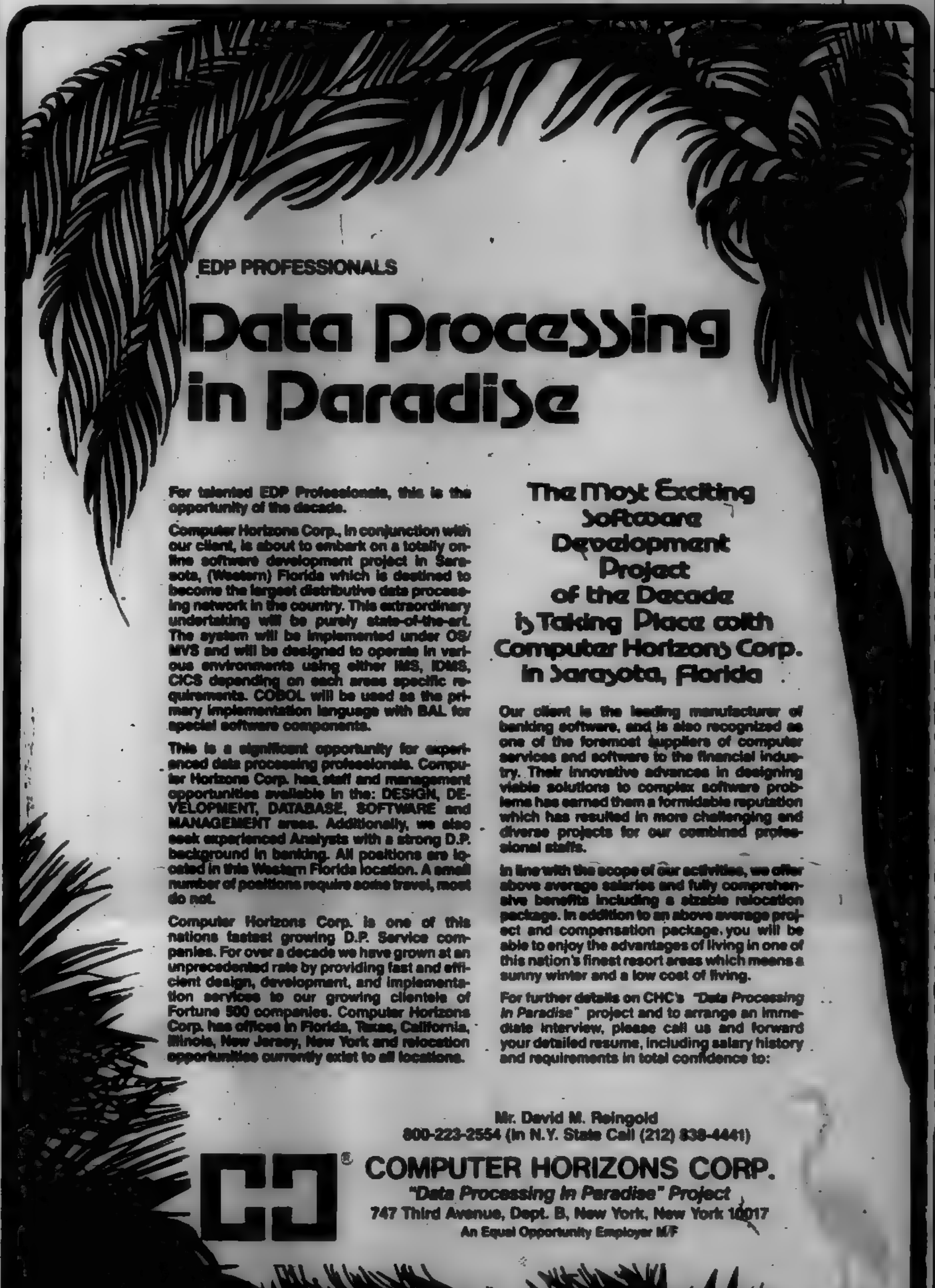


EDP PROFESSIONALS

Data Processing in Paradise

For talented EDP Professionals, this is the opportunity of the decade.

Computer Horizons Corp., in conjunction with our client, is about to embark on a totally on-line software development project in Sarasota, (Western) Florida which is destined to become the largest distributive data processing network in the country. This extraordinary undertaking will be purely state-of-the-art. The system will be implemented under OS/MVS and will be designed to operate in various environments using either IMS, IDMS, CICS depending on each areas specific requirements. COBOL will be used as the primary implementation language with BAL for special software components.

This is a significant opportunity for experienced data processing professionals. Computer Horizons Corp. has staff and management opportunities available in the: DESIGN, DEVELOPMENT, DATABASE, SOFTWARE and MANAGEMENT areas. Additionally, we also seek experienced Analysts with a strong D.P. background in banking. All positions are located in this Western Florida location. A small number of positions require some travel, most do not.

Computer Horizons Corp. is one of this nations fastest growing D.P. Service companies. For over a decade we have grown at an unprecedented rate by providing fast and efficient design, development, and implementation services to our growing clientele of Fortune 500 companies. Computer Horizons Corp. has offices in Florida, Texas, California, Illinois, New Jersey, New York and relocation opportunities currently exist to all locations.

The Most Exciting Software Development Project of the Decade is Taking Place with Computer Horizons Corp. in Sarasota, Florida

Our client is the leading manufacturer of banking software, and is also recognized as one of the foremost suppliers of computer services and software to the financial industry. Their innovative advances in designing viable solutions to complex software problems has earned them a formidable reputation which has resulted in more challenging and diverse projects for our combined professional staffs.

In line with the scope of our activities, we offer above average salaries and fully comprehensive benefits including a sizable relocation package. In addition to an above average project and compensation package, you will be able to enjoy the advantages of living in one of this nation's finest resort areas which means a sunny winter and a low cost of living.

For further details on CHC's *"Data Processing In Paradise"* project and to arrange an immediate interview, please call us and forward your detailed resume, including salary history and requirements in total confidence to:

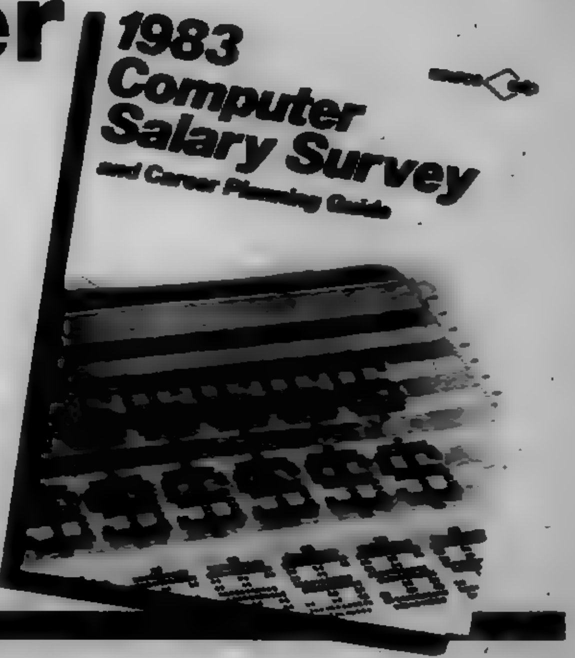
Mr. David M. Reingold
800-223-2554 (In N.Y. State Call (212) 838-4441)

COMPUTER HORIZONS CORP.
"Data Processing In Paradise" Project
747 Third Avenue, Dept. B, New York, New York 10017
An Equal Opportunity Employer M/F

Somehow, Did Your Last Raise Seem Insignificant?

New, Free Computer Salary Survey!

Learn about compensation in the computer field, including the effects of inflation and recession, and which career paths offer the greatest compensation from a 28-page report prepared by Source Edp.



Despite past inflation and recession, demand for computer systems and the people needed to support them continues to grow.

But which professionals, with what specialized experience and skills, are really in the best positions for long term career and salary growth? And is your salary really keeping pace?

In our new Survey, you'll get answers to these questions and much more.

Compare your salary with many others.

The new Survey not only provides salary medians for 48 position categories, but it also shows "highs" and "lows" for each one as well. Figures are organized by types of professionals, including those ranging from commercial programmers to management and marketing positions; by experience level and by size of computer installation site. So you'll be able to compare your salary with those computer professionals who have similar responsibilities and skills and to learn who in computing, in what kinds of specialized disciplines, are earning the most.

No other Survey we know of is more comprehensive. It's based on contacts with more than 50,000 professionals and 25,000 organizations.

Learn about new growth areas.

Most significantly, you'll also read about which specific areas of specialization are forecasted for unusual growth in this decade and beyond. The past year saw many changes in the economy and has altered career prospects for some professionals who were not properly prepared, so the need to stay abreast of current trends and career planning has never been so critical.

Whatever computer specialty you're in, or plan to explore—programming, software, systems design, data communications, mini/micro systems, data base, computer marketing, sales, management or others—our Survey can help you make the most of your career. You'll be able to keep up with changes in the profession, establish career goals, develop action plans, evaluate your progress, spot potential dangers, take corrective action when needed, and in general, keep your career on the best possible course for growth.

Call for your free copy.

The new *1983 Computer Salary Survey and Career Planning Guide* is available without charge. You owe it to yourself to get a copy of the report—especially if most of your career lies ahead of you.

Call today and our free 28-page Survey will be mailed to you in strict confidence, without obligation.

source edp
Personnel Services

The world's largest recruitment firm that specializes exclusively in the computer profession

Client companies assume our charges.

Call today.

Call the office nearest you.
If you're unable to call, write:
Source Edp
Department CS2
P.O. Box 7100
Mountain View, CA 94039

(When writing, be sure to include your title.)

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California	
Northern	
Mountain View	415/969-4910
San Francisco	415/434-2410
Walnut Creek	415/945-1910
Southern	
Century City	213/203-8111
Fullerton	714/871-6500
Los Angeles	213/688-0041
Newport Beach	714/833-1730
San Diego	619/231-1900
Torrance	213/540-7500
Van Nuys	213/781-4800
Colorado	
Denver	303/571-4450
Englewood	303/773-3700
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District of Columbia	
Washington D.C.	202/446-5890
Florida	
Miami	305/624-3536
Georgia	
Atlanta	
Downtown	404/588-9350
North	404/953-0200
Northeast	404/325-8370
Illinois	
Chicago	
East Loop	312/938-4400
West Loop	312/782-0857
Oak Brook	312/986-0422
Rolling Meadows	312/392-0244
Indiana	
Indianapolis	317/631-2900
Kansas	
Overland Park	913/888-8885
Kentucky	
Louisville	502/581-9900
Louisiana	
New Orleans	504/561-6000
Maryland	
Baltimore	301/727-4050
Towson	301/321-7044
Massachusetts	
Boston	617/482-7613
Burlington	617/273-5160
Wellesley	617/237-3120
Michigan	
Detroit	313/259-7607
Southfield	313/352-6520
Troy	313/362-0070
Minnesota	
Minneapolis	
Downtown	612/332-6460
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Missouri	
Clayton	314/862-3800
Kansas City	816/474-3393
New Hampshire	
Nashua	603/880-4047
New Jersey	
Cherry Hill	609/482-2600
Edison	201/494-2800
Morristown	201/267-3222
Paramus	201/845-3900
Princeton	609/452-7277
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New York City	
Grand Central	212/557-8611
Penn Station	212/736-7445
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Rochester	716/263-2670
Syosset, L.I.	516/364-0900
White Plains	914/683-9300
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Akron	216/535-1150
Cincinnati	513/769-5080
Cleveland	216/771-2070
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Dayton	513/461-4660
Oklahoma	
Tulsa	918/599-7700
Oregon	
Portland	503/223-6160
Pennsylvania	
King of Prussia	215/265-7250
Philadelphia	215/665-1717
Pittsburgh	412/261-6540
Wilkins Township	412/247-4400
Texas	
Dallas	
Central	214/954-1100
North	214/387-1600
Fort Worth	817/338-9300
Houston	
Downtown	713/751-0100
N. Loop West	713/957-8555
S.W. Freeway	713/626-8705
San Antonio	512/342-9898
Virginia	
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Bellevue	206/454-6400
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Milwaukee	414/277-0345
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Ontario	
Don Mills	416/425-5730
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Toronto	416/865-1125
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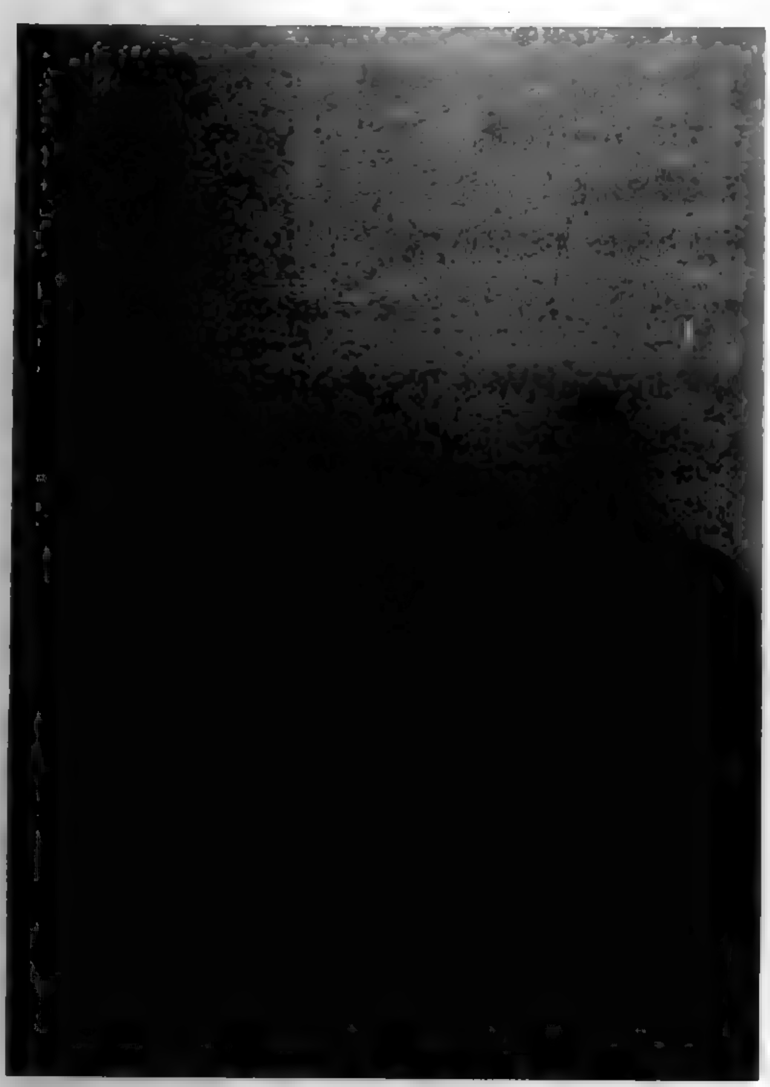
Montreal	514/849-7043

TEXAS SIZE TECHNOLOGY



SMALL TOWN COMFORTS!

An impressive IBM environment and quiet, tree-lined streets and country roads make GTE Data Services in San Angelo, Texas ideal for Computer Specialists. Here one can discover the perfect blend of big city technology and small town comforts. To learn more about the attractive data processing opportunities GTE San Angelo offers on and off the job, please send your resume to Ms. Jeanene Anderson

Management Staffing **GTE** GTE Data Services • 4750 Lincoln Blvd., Marina del Rey, CA 90291

An Equal Opportunity Employer

Software Engineer

Pacific Northwest

Be involved in the design and implementation of a major software product to support programmable logic devices. Software design exp. with state-of-the-art techniques required; exp. in language design and logic design strongly preferred. Requires MS/BS in Computer Science and/or EE plus 4-10 yrs. systems level software design exp.

Please expedite complete resume, including employment and salary history, to Professional Employment, DATA I/O CORPORATION, 10525 Willows Rd., N.E., Redmond, WA 98052. We are an equal opportunity employer. Individuals only apply.

DATA I/O

PROGRAMMER/ ANALYST

A six branch commercial bank, located in the U.S. Virgin Islands, seeks a Programmer/Analyst with 2 to 4 years of experience, strong in RPG II, IBM System/3, model 15D Disc System. No CCP. Banking application experience highly desirable.

We offer a competitive salary commensurate with experience, a full range of fringe benefits and relocation assistance. Send replies to: **Sheila Gallagher, Employment, FIRST PENNSYLVANIA BANK, 16th & Market Sts., Philadelphia, PA 19101.** An Equal Opportunity Employer, M/F.

First Pennsylvania Bank

MAINE

We have specialized in data processing professional placement in Maine for almost a fifth of a century. If you qualify for positions in the $25-35,000 range, please contact us in total confidence. Our clients pay our fees and provide relocation assistance.

ROMAC.

477 Congress St.
Portland, Maine 04101
(207) 773-4749

VICE-PRESIDENT SALES

Newly formed DP consulting/service company in Northern New England offers exceptional opportunity. Minimum 5 years proven DP services sales experience to government and Fortune 1000 accounts.

Reply to CW-B4039
Computerworld
375 Cochituate Rd., Box 880
Framingham, Mass 01701

DATA PROCESSING PARTIAL LISTING

Manager-Methods & Procedures
Mid 40's. #2 MIS Person. Be responsible for all internal systems and operations. Emphasis in a high volume paper processing environment. Multiple CPU, MVS. Outstanding corporate track record needed.

(2) Systems Programmers
Low 30's. Southwest region. 3033/158. 1 Programmer responsible for MVS upgrade to SP3, the other programmer to handle TP, ACF/VTAM-/CICS.

Director of Information Services
Low 40's. 300 bed medical facility is installing new SMS. Build MIS from ground up. Tremendous benefits. Also seeking candidates for Director of DP and also an Installation Coordinator.

DATASEARCH
Div. of Management Search, Inc.
233 Peachtree St., Ste. 1550
Atlanta, Georgia 30303
(404) 659-5050
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Offices in Atlanta, McLean, Va., Charlotte, NC

MIS DIRECTOR

The MIS division of an established, growth oriented, California based manufacturing company is embarking on an aggressive information systems development effort. This new position requires an experienced individual to plan, direct and control the MIS function in developing information resources which support the strategic direction of the company.

If your career background and goals match the following requirements, we would like to talk to you about an exciting opportunity:

- Approximately 7 years management and leadership experience with high professional, planning/project management and human resource skills.
- Demonstrated technical abilities in the planning, development and implementation of manufacturing and financial application reporting systems, including MRP and MPS
- Hardware and software experience in an IBM 43XX, 370, or 30XX environment.
- Ability to effectively communicate and interact with senior management and user departments.
- Undergraduate degree preferred.

For prompt confidential consideration, please submit your resume and compensation history to:

Reply to CW-B4046
Computerworld
Box 880
Framingham, MA 01701

Software Professionals

We make them happen!

Creating Superior Software For Superior Systems

Software Systems Laboratory... the Software House for Raytheon's Equipment Development Laboratories. We bring life — and intelligence — to a wide range of real-world systems: air traffic control, weapons direction, fire control, communications, missile guidance, tracking and data gathering, space surveillance, range instrumentation, plus an emerging set of laser applications.

We're looking for software engineers who want to explore their full potential developing a wide range of applications in a highly-charged, up-to-date environment. Software applications, most of which are real-time and highly complex, run the gamut from data processing, control processing, and signal processing to such special applications as display processing, simulation, system and unit-level diagnostics, CAD, and firmware. Software engineering that encompasses: system level tradeoffs (including selection of the data processing environment), requirements definition, classical software development/test, and system integration and test.

Join our outstanding team of software professionals, and you'll be creating the state of the art, not following it. You'll work with a network of VAX computers dedicated to Software Development and to an ever-expanding array of modern tools and techniques. You'll also find the variety of assignments you need to keep you not only current in your field, but fresh and excited about working in it.

If you're the kind of software engineer we're looking for, you'll enjoy making ideas happen in a systems environment, you'll be eager to step up to the demands of defining "front end" requirements, and you'll be ready to assume a design implementation leadership role.

At Raytheon's Software Systems Laboratory, we know how to make ideas — and systems — happen. We also know how to transform your experience and ambition into a very rewarding career.

Software Systems Engineers

Software engineers at Raytheon are key players in these front-end activities that translate system requirements into software performance specifications. We seek experience and/or interest in the following areas:

- Requirements Analysis
- Software/Hardware Trade-offs
- Modeling of Critical Performance Characteristics
- Interface Definition
- Data Processing Architecture Definition
- Software Test Selection
- Performance Specification Preparation

Radar Systems Software Engineers

Radar systems play a key role in Raytheon's product mix, and major software challenges exist in this area. We seek experience in the following areas:

- Radar Data Processing
- Object Classification and Discrimination
- Real-Time Control Systems
- Embedded Computer Systems
- System- and Unit-Level Diagnostics

System Programmers

To support our various applications, we are undertaking a major expansion of our System Software Department. We seek experienced applicants in the following areas:

- Operating Systems, especially VMS, UNIX, and RT11
- Languages, including C, Pascal, FORTRAN, JOVIAL/J73, and Ada
- Development of Microprocessor Cross-Compilers, Assemblers, and Loaders
- Performance Measurement and Prediction
- User Education and Assistance
- Real-time Operating Systems Development
- Configuration Management Tools
- Improvement of Software Development Techniques
- Hardware Selection, System Management, and Capacity Planning
- Networks and Communication Protocols

Air Traffic Control Software Engineers

Raytheon is currently engaged in several Air Traffic Control program areas, including existing and planned enroute and terminal ATC Systems, for both domestic and international applications; aircraft/controller digital communications and dynamic simulation/training. We seek experienced candidates in the following areas:

- Radar Data Processing/Track File Management
- Flight Plan Processing
- Channel Management
- Intercomputer Communications
- Mosaicking

Assignments in the Washington, DC area also available.

Computer Diagnostics Software Engineers

Raytheon has been engaged in the design and development of advanced militarized computers employing the latest in technology for fault tolerant techniques and high speed architectural concepts. Currently under development are several general purpose militarized super minicomputers employing sophisticated built-in test circuitry and high speed parallel pipelined architectures. We seek experience in the following areas:

- Micro and Macro Diagnostics for fault detection and isolation
- Automatic Test Systems
- Intelligent Control Panel System Development

Communications Systems Software Engineers

Raytheon is a leading company in the development of advanced satellite communications terminals employing sophisticated microprocessor technology for processing and system control. We seek experienced candidates in the following areas:

- Antenna Pointing Systems
- Ephemeris Data Processing
- Multi-Access Algorithms
- Built-in Test and Diagnostics

Graphics Software Engineers

Raytheon's Graphics Group develops real-time, interactive display software that will comprise the next generation of "user-friendly" man/machine interfaces in radar, sonar, communications, air traffic control and image processing. We seek experienced candidates in the following areas:

- Real-time Software Design (C, PASCAL, FORTRAN or Assembly Language)
- Cursive and Raster Graphics Techniques
- SIGGRAPH "CORE" Specification Experience
- Data Communications and Network Protocols
- Signal/Image Processing Technology
- Plasma Panel/Touch Entry Devices

The preceding positions require a degree in engineering or computer science, at least 5 years of directly related experience, a mind open to new ideas, and a willingness to work hard. If you meet these requirements, we will provide you with a stimulating and congenial environment, pay you a competitive salary, and give you as much responsibility as you are ready to handle. We are located in the Boston suburbs, an area that many consider to be among the finest in the country in which to live and work.

For further information concerning the aforementioned positions, please direct your resume, including current salary, in strictest confidence to: Paul Houle, Dept. 110, Raytheon Equipment Development Laboratories, 528 Boston Post Road, Sudbury, MA 01776.

RAYTHEON

An Equal Opportunity Employer

RAYTHEON COMPANY

EQUIPMENT DIVISION

☐ Air Traffic Control ☐ Shipboard and Ground Radars ☐ Computers and Displays ☐ Missile Guidance ☐ Military Communications ☐ Electro-Optics ☐ Fire Control Systems

EASTERN

COMPUTER CAREER OPPORTUNITIES

Eastern Airlines is anticipating openings in its two Miami computer centers in 1983 for experienced data processing applicants meeting any of the following requirements:

DATA BASE ADMINISTRATION

- IMS/DL1, ALC, COBOL, CICS, DMS or PAF

MVS SYSTEMS PROGRAMMING

- Any of the following:
- CICS, ACF/TCAM, NCP, MVS, JES2, JES3, TSO, SMP, IIPS, NCCF, VSAM, JCL

UNIVAC PROGRAMMING

- U1100 EXEC Internals or DCP Communications, USAS Internals

ACP PROGRAMMING

- BAL, ACP/PARS real time systems
- Instructor position also available

TRAVEL AGENCY SYSTEM PROGRAMMING

- RDOS or AOS on Data General Equipment
- ICOBOL or BASIC

MVS APPLICATIONS PROGRAMMING

- COBOL, CICS, DL1, PL1

Eastern offers excellent career growth potential, company paid dental, medical, life and retirement insurance, relocation reimbursement, and outstanding worldwide travel discounts. Living in Florida offers a sun-filled casual outdoor life style with no state income tax.

If you meet any of the above requirements and would like to work for one of the industry leaders in computer technology, please send a detailed resume including salary history to:

EASTERN AIRLINES

Management Recruiting
Dept. A.M.
International Airport
Miami, FL 33148

An Equal Opportunity Employer

SENIOR SYSTEMS ANALYST

BarclaysAmericanCorporation is seeking an outstanding senior systems analyst for the newly created position of Structured Design Methodology Manager. In this position you will interact with senior level managers and be involved in the analysis, design, and implementation of all new systems. These activities will be performed in an environment which utilizes OS/MVS, CMS/SPF, and which is committed to training and maintenance of technical and business skills.

To qualify, you must have 5-6 years of data processing experience with at least 3 years as a systems analyst. A proven record of developing new systems using structured techniques, a thorough understanding of project documentation and excellent oral/written communication skills are also required.

If you're looking for increased responsibilities and more challenging work in a dynamic, growth-oriented company, send your resume, in confidence to:

John L. Nolan, Employment Manager

Barclays American

An affiliate of BARCLAYS Bank

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An Equal Opportunity Employer M/F/H/V
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DIRECTOR OF MARKETING

Outstanding Opportunity in High Growth Firm

SofTech Microsystems is one of the microcomputer industry's fastest growing companies. The firm is an international supplier of microcomputer system software products featuring the UCSD p-System, a growing family of related operating system and development software products. Major clients include computer manufacturers such as IBM, Texas Instruments, DEC, Osborne, as well as leading application software suppliers and large volume microcomputer users.

As Director of Marketing, you will report directly to the Vice President of Marketing and Sales. You will plan, organize and direct product marketing functions and marketing support. You will also be responsible for developing markets and distribution channels for all of the Company's systems software products, and you will participate in establishing and implementing strategic marketing goals.

To qualify, you must have seven years marketing experience with at least two years of strategic product marketing in the computer industry. Microcomputer product management and distribution experience is most desirable. Systems software knowledge is essential. Personal qualities needed include exceptional organization and communications skills as well as the ability to work independently in a growing and dynamic environment.

We offer competitive earnings, excellent benefits including three (3) weeks vacation and bonus participation. Send your resume, including salary history, to Janis W. Richards, SofTech Microsystems, 16885 West Bernardo Drive, San Diego, CA 92127.

An Affirmative Action/Equal Opportunity Employer M/F/H

SOFTECH MICROSYSTEMS

Professional Advancement Job Opportunities

PACIFIC HEALTH RESOURCES

Pioneers in Hospital Management Services

. . . is conducting a search for several key data processing professionals to join our expanding, innovative hospital management team.

SENIOR SYSTEMS PROGRAMMER

To provide technical support and evaluation of new products. Requires 4+ years with large IBM system and knowledge of MVS, CICS, and ACF-VTAM.

SENIOR PROGRAMMER ANALYST

To develop our Patient Care System. Requirements include 3-5 years of CICS and DL-1 with PL-1 and hospital applications experience helpful.

PROGRAMMER ANALYST

To support financial applications including MSA and/or Software International. Requires 3+ years Cobol programming on large IBM systems.

You can be part of our elite information systems team. Your training and experience will be challenged and advanced as we continue to expand.

For immediate confidential consideration, please send your resume to: Franklin D. Carr, 1423 So. Grand Ave., Los Angeles, CA 90015, or phone (213) 742-6411. EOE.

Pacific Health Resources

FACULTY POSITION

Applications are invited for one or possibly two tenure-track faculty positions in the Computer Science Department at Instructor, Assistant, Associate, or Professor level. Starting date is August 16, 1983. A candidate with a Ph.D. in Computer Science or related field is preferred, but candidates with a Masters degree will also be considered. For Associate or Professor level the candidate must have a Ph.D. in Computer Science or related field with either teaching or industrial experience. The Computer Science Department is a part of a newly created Center for Aerospace Sciences. The department offers a full range of undergraduate courses to 500 majors and a variety of service courses to the general student body. The computer equipment includes IBM 370/158, IBM 4341, Interdata 832, PDP 11/44 and various microcomputers. The department is expecting to be in the new multimillion dollar Aerospace Sciences building in 1983. Numerous opportunities exist in conjunction with aerospace research projects. A Masters program in Computer Science is currently being developed. Salary is open and competitive. Benefits include TIAA-CREF and Blue Cross - Blue Shield. A Group disability insurance is also available. Deadline to apply is March 15, 1983. Send resume and three letters of reference to:

Dr. Mok Tokko
Computer Science Department
Box 8181 University Station
Grand Forks, ND 58202.

UND is an equal opportunity institution

PROGRAMMING MANAGER

Our client, a long-established service organization, is seeking a professional to join their management team. Responsibilities include supervision of a 4-person programming staff and project management. This is a twin IBM mainframe environment. Knowledge of COBOL, DOS/VM is required. A degree is a plus. Relocation and interview expenses paid. First years earnings to $38,000.

SYSTEMS PROGRAMMER

Our client, a growing service company, seeks a Systems Programmer to give general support to the operating system and to implement standards and documentation. Knowledge of OS or MVS required. Relocation and interview expenses paid. First years earnings to $40,000.

F-o-r-t-u-n-e

Personnel Consultants of Nashua
194 Broad St. Dept C.
Nashua, NH 03063
(603) 880-6680

Company Paid Fees

CHICAGO

PROGRAMMER

Terrific Opportunity for system 38 Programmer. If you have extensive experience on system 38, this is the company for you. Immediate challenge and opportunity for advancement. Excellent Benefits. $30,000. Contact Ed Byrnes.

ROBERT HALF OF CHICAGO, INC.

36 E. Wacker
Chicago, IL 60601
312-782-6930

CONSULTANTS TO $35K +

We have been retained by several national clients to recruit DP professionals. The positions include all combinations of hardware & software, including IBM, HONEYWELL, MINIS, MICROS, COBOL, PASCAL, IMS, IDMS, ADABAS, etc. If you have a min of 2 yrs experience and can work in various US locations, call me immediately. **BOB GREENBERG**

McFadden
811 Church Rd.,
Suite 214
Cherry Hill, NJ 08002
(609) 488-0500

ROBERT HALF

EDP OPPORTUNITIES COAST TO COAST

Robert Half, staffed by EDP professionals for EDP professionals with 80 offices throughout the U.S., Canada & Great Britain, is the largest network of personnel consultants in the Data Processing field. And its establishment in 1948 also makes Robert Half the oldest. One call and you can search the local, national and international markets. All fees are paid by client companies, of course. The following is a partial listing of opportunities and locations:

BOSTON

COBOL P/A'S–MAINE

Internat'ly known & respected mfr seeks promotable COBOL specialists to expand MIS dept. IBM DOS/VSE shop upgrading to OS/MVS using COBOL, DL-1, CICS/VS w/fin'l & mfg sys. Attractive rural setting. Reloc pd. **$23-30,000** range

LEAD SYS ANALYST

Progressive multi-mil dollar mfr seeks businesslike & results oriented MIS pro to direct new devel projs. IBM 4341 DOS/VSE under VM w/DL-1, CICS & CMS. Fast track org in rustic environ. Reloc pd. **$34,000**

DATA BASE ADMIN

Leading consumer goods org searching for top notch DB Admin. In-house IBM state-of-the-art mainframe connected to remote sites. Strong mfg sys w/IMS or IDMS req. Career oppty within growing org. Reloc pd. **$37,000**

Gerry Battista
ROBERT HALF
of Boston, Inc.
100 Summer Street
Boston, MA 02110
(617) 423-1200

PROVIDENCE

CONSULTANTS–IBM S/34-38

EXCLUSIVE-RH client seeks several consultants for IBM S/34-38 MAPICS & DMAS devel. Top notch hi-visibility pos req both excellent user skills & tech exp in communications, data base, RPG II/III, SDA, WSU, CL & DFU. This is a prestigious, growth oriented firm with a net marketplace.

Salaries to **$33,000**

ROBERT HALF
of Providence, Inc.
400 Turks Head Building
Providence, RI 02903
(401) 274-6700

MINNEAPOLIS ST. PAUL

DIRECTOR OF DATA PROCESSING

Major firm seeks assertive DP mgmt professional to assume responsibilities for large IBM state-of-the-art shop. Extensive liaison with senior mgmt. Requires bkgrd with a financial institution (banking, S&L or related industries)

Salary **$50-65,000**

Mark David
Bill Thompson
ROBERT HALF
of Minnesota, Inc.
2236 IDS Center
Minneapolis, MN 55402
(612) 339-9001

HARTFORD

DP MANAGER

CT oppty for degreed indiv w/8+ yrs in mfg, 3 yrs in mgmt. Familiar w/all fin'l/mfg apps. S/34 or S/38 exp a plus. **$52,000**

PROJECT MGRS

Ins pro's. Exciting oppty's for indiv w/6–8 yrs DP. lge IBM bkgrd, structured analysis, supvry exp to manage new devel projs. Bkgrd in life, grp & pensions a plus. **$42,000**

SYSTEMS PROGRAMMERS

CT oppty's for IBM DOS/VS. CICS internals indiv's to direct all current/future software plans. Mgmt potential for near term **$35,000**

Stan Durbes
Burt Israel
ROBERT HALF
of Hartford, Inc.
111 Pearl Street
Hartford, CT 06103
(203) 278-7170

BUFFALO

SYS ANALYST

Profitable div of mfg co located CENT NY State. Present respons are stand along design & implem tasks in production, invty & admin acctg apps. Pos will lead to top mgmt. Must be aggressive, hard working cand. Bkgrd must incl sm to med hardware exp in a mfg co environ. Rpts to copr MIS Mgr. **$32,000**

P. Siegel
ROBERT HALF
of Buffalo, Inc.
1310 Liberty Bank Bldg.
Buffalo, NY 14202
(716) 842-0601

NEW ORLEANS

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Long Island, New York

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The successful candidate will possess strong systems design skills and will have responsibility for the development of new fully integrated financial and manufacturing systems utilizing PDP 11/70 and VAX 11/780 hardware with VMS and RSTS/E operating systems. A minimum of four years of BASIC + and two years of RSTS/E is required. Transcomm experience would be a plus.

If you are a highly motivated self-starter with a proven track record and are looking for an outstanding growth opportunity, with an excellent compensation and fringe benefit package, please send your resume, including salary history, in strict confidence to:

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EOE M/F
Principals only

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Resumes should be submitted to the Employment Division, P.O. Box 2842, St. Petersburg, Florida 33731.

AA/EOE

The deadline for receiving resumes is January 15, 1983.

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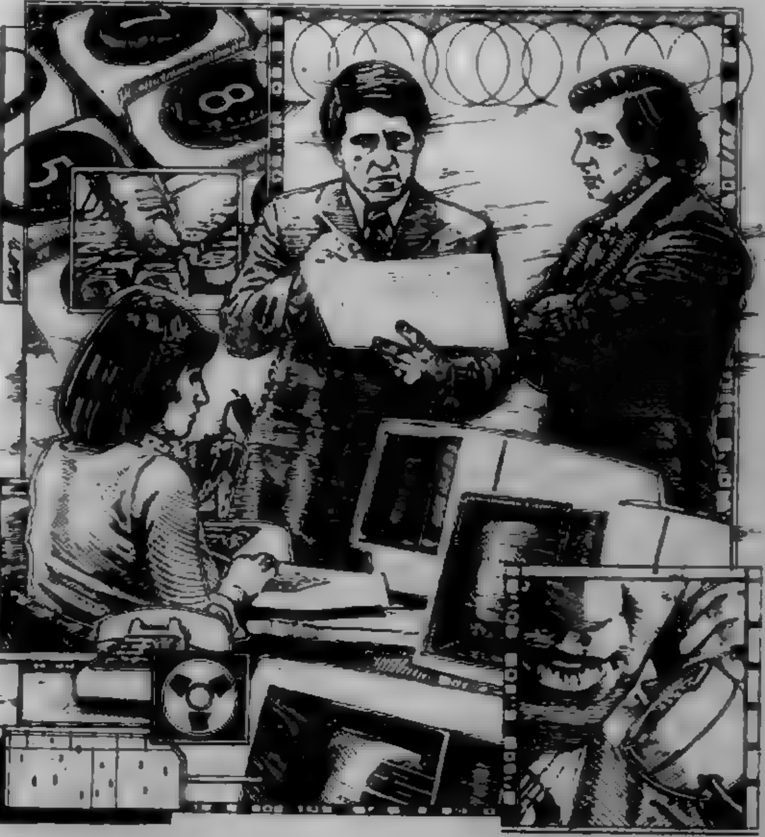

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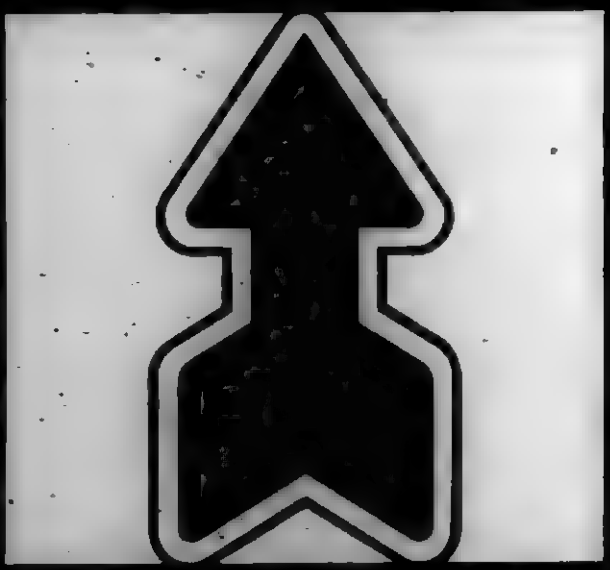

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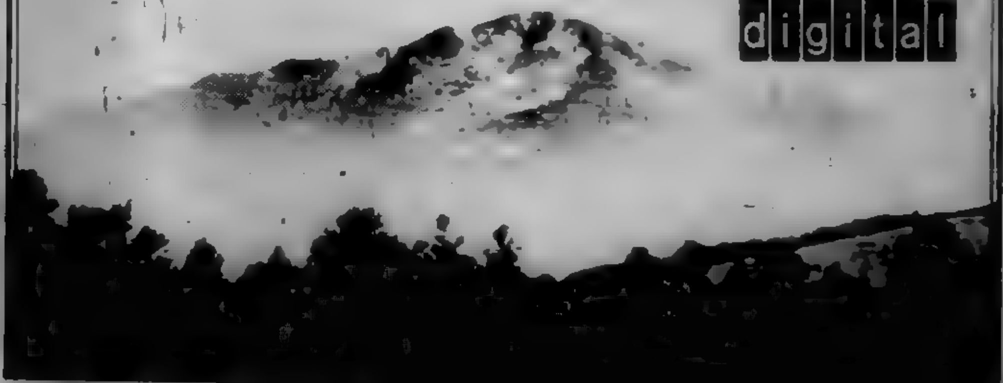

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Oregon Institute of Technology
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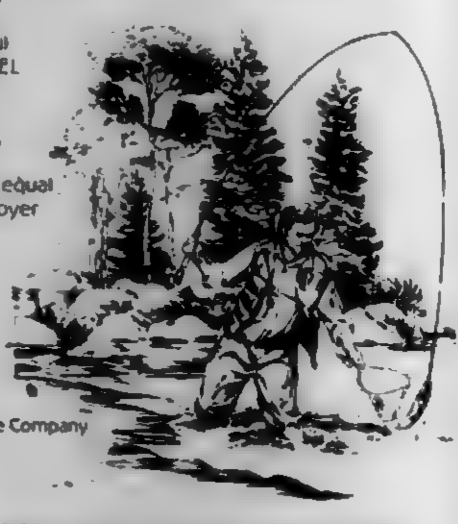

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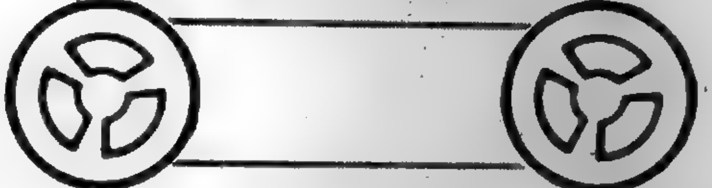

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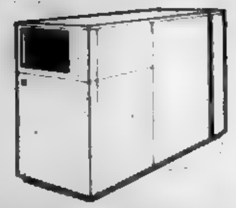

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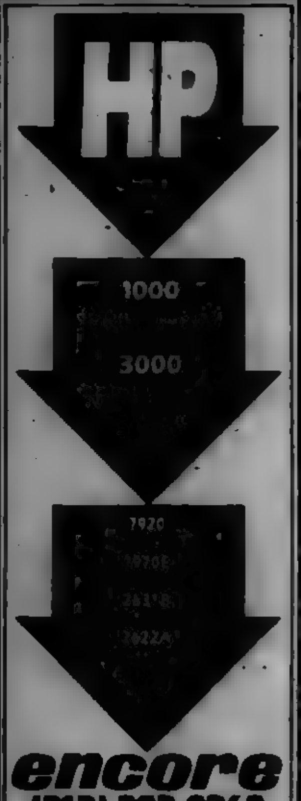

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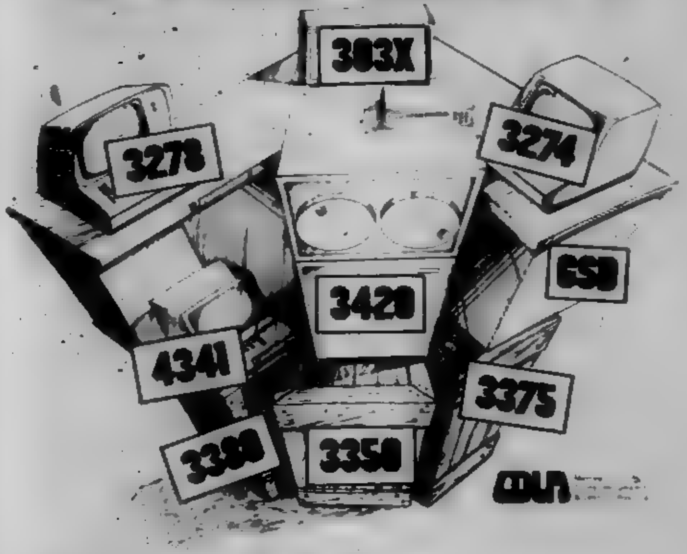

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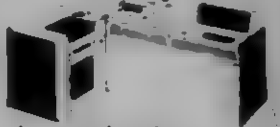

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Applied Computer Sciences 70
Applied Data Research 3
BDS Computer Corp. 11
John Beall Company 65
Boeing Computer ID/14
C.C.S. ID/13
Cincom Systems, Inc. 66-67
Circle Computer Services, Inc. 44
Codex Corporation ID/6-ID/7
ComDesign 48
Computeristics 13
Computer Technology 8
Computerworld Comnet 72
Computerworld International 64
Computerworld Office Automation 71
Computerworld Subscriptions 33
Computerworld Supplement 62
Comshare 46-47
Cord Cable Co. ID/14
CRWTH 49
C-S Computer ID/7
Cullinane Database 35
Curtis 1000 ..... ID/2
Dallas Market Center ID/8
Data Base Management 10
Data General 60-61
Data Management 24
Datapoint Corporation 50
Datapro 25
Data Rentals/Sales Inc. 53
Deltak 40
Digilog 52
Digital Controls Corp. 63
Digital Equipment Corp/
—Educational Services 58-59
Digital Equipment Corp/
—NPM VAX ID/4-ID/5
Digital Equipment Corp/
—Professinal PC 28-29
Direct, Inc. 55
D.P. Facilities ID/12
E.E.C. Systems 12
Fidelity 14
Froogl Software 56
Fusion Products 20
General Electric 57
General Research Corporation 24
Genesys Software 39
Goal Systems International 15
Robert Half-NYC 21
Hewlett-Packard 36-37
Highlander Systems 12
IBM ID/15
Information Science Inc. 20-21
Informer Inc. ID/10
Innovation Data Processing 7
Innovative Electronics 34
Invitational Computer Conference ID/16
ISO World 54
KW Control Systems 52
Lear Siegler ID/3
Lee Data Corp. 56
MacMillan Book Clubs 43
Management Science of America 102
MicroAge 18
MTI Systems Corp. 16
Mike Murach & Associates 9
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NEC Info. Systems 19
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Parallax Systems 6
Personnel Data Systems, Inc. 14
Popcom 34
Ram-Tek 68-69
SAS Institute ID/11
Signal Technology, Inc. 48
Software Results 34
Solutions, Inc. 38
Sysed 12
Sytek Corporation 22
Technalysis 38
Technical Management Services 22
Teleray 45
Texprint 30
Thomas-Laguban & Associates 30
Tone Software Corp. 48
University Computing Co. 32
U.S. Data Systems 18
Verbatim 23
Vertex Systems, Inc. ID/3
Walker Interactive Products 17
Wang Labs 51
Yourdon 5

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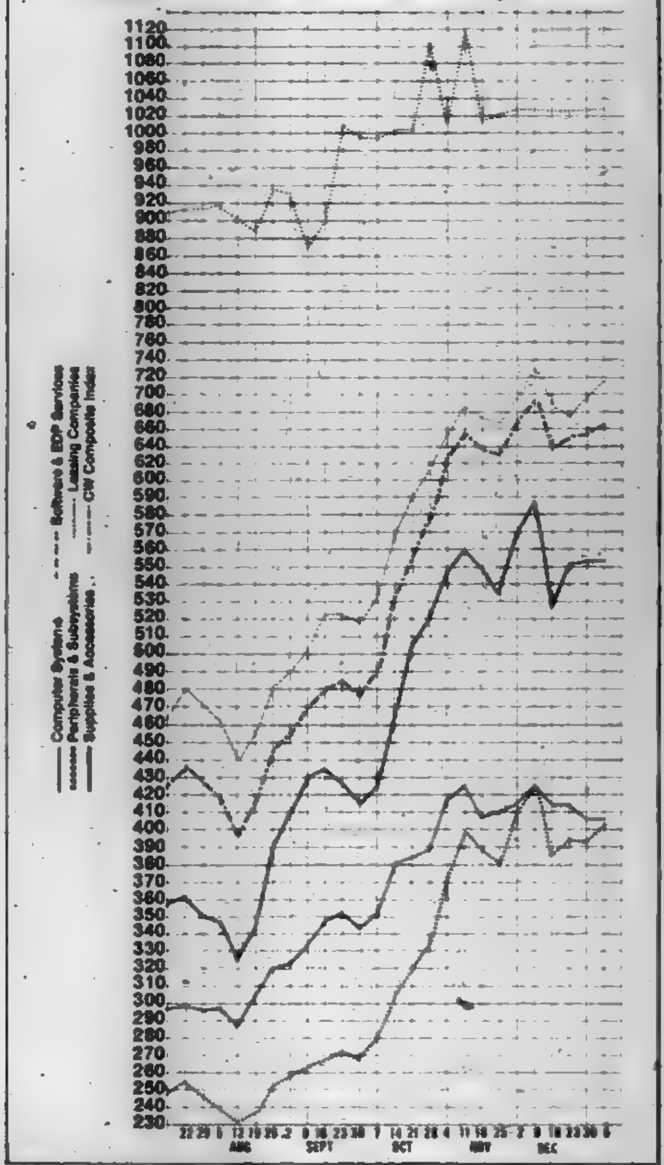
Computerworld Stock Trading Index



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EXCH		1982-83 RANGE (1)	CLOSE JAN 5 1983	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP	17- 35	29 5/8	+2 1/2	+9.2
N	BURROUGHS CORP	28- 48	41 5/8	-1	-2.3
O	COMPUTER AUTOMATION	7- 17	14 1/8	-2 1/8	-13.0
N	CONTROL DATA CORP	21- 42	37 3/4	+ 3/8	+1.0
N	CRAY RESEARCH INC	20- 49	37 1/2	+2	-5.0
N	DATA GENERAL CORP	20- 59	40	+ 5/8	+1.5
N	DATAPOINT CORP	11- 54	18	- 1/4	-1.3
N	DIGITAL EQUIPMENT	62-113	94 1/4	-6 1/4	-6.2
A	EECO INC	6- 11	8 3/4	0	0.0
N	ELECTRONIC ASSOC.	5- 12	9 3/4	- 1/2	-4.8
N	FLOATING POINT SYST	16- 30	25 3/8	-1 1/4	-4.6
N	[illegible] CORP	22- 39	35 3/8	+ 1/8	+0.3
O	[illegible] COMP GRP	1- 3	1/4	0	0.0
O	GENERAL AUTOMATION	2- 8	5 3/4	- 3/8	-6.1
N	HARRIS CORP	20- 43	38 3/4	+ 1/2	-1.3
N	HEWLETT PACKARD CO	28- 92	73	- 5/8	-0.8
N	HONEYWELL INC	60-104	83 5/8	-3 3/8	-3.8
N	IBM	48- 97	98	- 5/8	-0.6
O	IPL SYSTEMS INC	5- 9	6	+ 3/4	+14.2
O	MAGNUSON COMP SYSTS	2- 16	3 3/8	+ 3/4	+28.5
N	MANAGEMENT ASSIST	7- 18	11 3/4	+1	+9.3
O	MINI COMPUTER SYST	1- 4	5/8	0	0.0
N	MODULAR COMPUTER SYS	6- 13	11 5/8	+ 5/8	+5.6
N	MOHAWK DATA SCI	10- 19	14 7/8	+ 1/2	+3.4
N	NCR	35- 95	83 1/2	-9 5/8	-8.3
N	PERKIN-ELMER	17- 32	27 1/4	-1 1/8	-3.8
N	PRIME COMPUTER INC	16- 38	35 3/8	+ 1/8	+0.3
N	SPERRY CORP	21- 37	33	- 3/4	-2.2
O	TANDEM COMPUTERS INC	14- 34	24 1/8	-1 3/4	-6.7
N	TEXAS INSTRUMENTS	71-151	128 3/4	-7 3/8	-5.4
A	WANG LABS "B"	13- 37	30	+1 1/4	+4.3
A	WANG LABS "C"	11- 3[illegible]	26 3/8	+ 1/8	+0.4

LEASING COMPANIES

EXCH		1982-83 RANGE (1)	CLOSE JAN 5 1983	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE FINANCIAL CP	22- 28	26 3/4	0	0.0
N	COMDISCO INC	13- 35	34 1/8	+ 7/8	+2.6
O	COMMERCE GROUP CORP	1- 1	1/4	0	0.0
O	COMPUTER INVSTRS GRP	1- 2	3/8	0	0.0
O	CONTINENTAL INFO SYS	5- 20	12	+ 3/4	+6.6
N	DPF INC	5- 13	9 1/8	0	0.0
O	ITEL	1- 3	1 1/2	0	0.0
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	18- 37	35	- 1/4	-0.7

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH; B=BOSTON
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		1982-83 RANGE (1)	CLOSE JAN 5 1983	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 6	2 1/4	+ 1/2	+28.5
O	ADVANCED SYSTEMS INC	9- 15	18 3/4	0	0.0
O	AGS COMPUTERS INC	7- 17	14 3/4	- 3/4	-4.8
N	[illegible]	9- 18	14 7/8	-1 1/4	-7.7
O	ANALYSTS INTL CORP	5- 8	7 1/2	- 1/2	-6.2
A	APPLIED DATA RES.	16- 42	38 7/8	- 1/2	-1.2
O	ASK COMPUTER SYSTEMS	12- 27	23	+ 1/4	+1.0
O	ASTRADYNE COMP IND	1- 3	2 3/4	+ 7/8	+46.6
N	AUTOMATIC DATA PROC.	21- 37	35 1/2	-1 1/2	-4.0
O	CGA COMPUTER ASSOC	5- 9	8 1/2	0	0.0
O	COMPUTER ASSOC INT'L	10- 30	22 3/4	-2	-5.9
O	COMPUTER HORIZONS	1- 3	6 3/4	- 1/4	-3.5
O	COMPUTER NETWORK	4- 9	7 3/8	+ 1/4	+3.5
N	COMPUTER SCIENCES	11- 20	18 1/4	- 3/4	-3.9
O	COMPUTER TASK GROUP	8- 18	15 3/4	+1 1/2	+10.5
O	COMPUTER USAGE	2- 6	5 1/2	+ 3/4	+15.7
O	COMPUTONE SYSTEMS	13- 30	28 7/8	- 7/8	-3.1
O	COMSERV CORP	11- 20	16 1/4	- 1/4	-1.5
O	COMSHARE	6- 10	7	+ 3/8	+5.8
N	CULLINANE DATABASE	24- 53	48 3/4	+2 3/4	+5.8
O	CYCARE SYSTEMS INC	8- 18	14 1/4	- 3/4	-5.0
O	DATA DIMENSIONS INC	1- 3	1/4	0	0.0
O	DATATAB	0- 1	5/8	+ 1/8	+25.0
O	DYATRON CORP	2- 4	3 1/8	+ 5/8	+25.0
N	ELECTRONIC DATA SYST	18- 54	44 7/8	- 3/8	-0.8
O	INFORMATICS INC	10- 24	20 3/4	+ 3/8	+1.8
O	INSYTE CORP	1- 3	1 7/8	+ 1/8	+7.1
O	IPS COMPUTER MARKET.	1- 2	1 1/8	- 1/8	-10.0
O	KEANE ASSOCIATES	4- 8	6 1/2	-1 1/4	-16.1
A	LOGICON	12- 29	28 7/8	+1	+3.5
O	MGMT SCI AMER INC	9- 21	18 3/4	- 3/4	-3.8
O	MATHEMATICA INC	12- 18	15	+ 1/2	+3.4
O	MATHEMATICAL APP GRP	12- 18	16	+2 3/4	+20.7
O	NATIONAL DATA CORP	13- 26	23	- 1/8	-0.5
O	PANSOPHIC SYSTEMS	8- 20	17	- 3/8	-2.1
N	PLANNING RESEARCH	6- 11	10	- 1/4	-2.4
O	PROGRAMMING & SYS.	1- 3	2 7/8	0	0.0
O	REYNOLDS & REYNOLD	17- 31	31	+ 1/4	+0.8
O	SEI CORP	21- 45	38 1/2	- 3/4	-1.9
O	SHARED MEDICAL SYST	28- 55	53 3/8	-1 5/8	-2.9
O	SCIENTIFIC COMPUTERS	6- 13	11	+1	+10.0
O	SOFTWARE AG	8- 17	10 1/2	0	0.0
N	TYMSHARE INC	12- 30	18 3/8	+ 7/8	+5.0
A	URS CORP	10- 15	15	+ 3/4	+5.2
N	WYLY CORP	7- 12	8 1/4	0	0.0

PERIPHERALS & SUBSYSTEMS

EXCH		1982-83 RANGE (1)	CLOSE JAN 5 1983	WEEK NET CHNGE	WEEK PCT CHNGE
N	AM INTERNATIONAL	1- 19	2 1/4	0	0.0
A	ANDERSON JACOBSON	6- 25	18 5/8	+ 5/8	+3.2
O	AUTO-TROL TECHNOLOGY	8- 19	14 1/4	- 1/4	-1.7
N	[illegible] INC	7- 33	15	- 3/4	-4.7
A	BEEHIVE INT'L	4- 8	9 1/8	+ 1/8	+1.2
A	BOLT,BERANEK & NEW	9- 34	31 1/2	+ 1/2	+1.6
O	CAMBEX CORP	2- 4	2 3/8	+ 1/2	+28.6
N	CENTRONICS DATA COMP	6- 17	13 1/4	- 1/4	-1.8
A	CETEC CORP	4- 8	5 1/2	- 1/4	-4.3
O	COGNITRONICS	2- 8	6 3/8	+ 1/8	+1.9
O	COMPUTER COMMUN.	1- 2	3/4	0	0.0
A	COMPUTER CONSOLES	1[illegible]	[illegible]	-1	[illegible]
O	COMPUTER DEVICES INC	4- 21	11 [illegible]	[illegible]	[illegible]
O	COMPUTER TRANSCEIVER	4- [illegible]	5 1/4	- 1/8	[illegible]
N	COMPUTERVISION CORP	10- 18	31 3/8	+1 1/2	+5.0
N	CONRAC CORP	21- 36	32 1/2	+ 1/8	[illegible]
A	DATA ACCESS SYSTEMS	[illegible]	7	- 1/4	[illegible]
A	DATAPRODUCTS CORP	16- 36	14	[illegible]	[illegible]
A	DATARAM CORP	5- 10	[illegible] 1/2	[illegible]	[illegible]
O	DATUM INC	2- 6	5 1/2	- 1/4	[illegible]
O	DAVID JAMISON CARLYL	[illegible]	4 [illegible]	[illegible]	+6.8
O	DECISION DATA COMPUT	2- 14	[illegible]	[illegible]	[illegible]
O	DELTA DATA SYSTEMS	[illegible]	2 3/8	[illegible]	[illegible]
N	ELECTRONIC M & M	5- 8	6 [illegible]	[illegible]	[illegible]
O	EVANS & SUTHERLAND	10- 44	43 1/2	+2	+4.8
O	GANDALF TECHNOLOGIES	10- [illegible]	17 1/4	[illegible] 1/4	[illegible]
N	GEN'L DATA COMM IND	8- 18	16 1/2	[illegible] 1/2	[illegible]
O	GENERAL TERMINAL CP	0- 4	5/8	+ 1/8	[illegible]
O	GREAT SOUTHWEST IND	[illegible] 8	3	+ 1/4	+33.3
N	HAZELTINE CORP	22- 43	39 3/8	0	0.0
O	ICOT CORP	3- 8	7 3/8	- 7/8	[illegible]
O	INFORMATION INTL INC	[illegible]	[illegible] 3/4	[illegible]	[illegible]
O	INTEL CORP	21- 42	30	[illegible]	[illegible]
O	IPL SYSTEMS INC	5- 9	6	+ 3/4	+14.2
A	LUNDY ELECTRONICS	7- 14	[illegible]	[illegible]	[illegible]
A	MSI DATA CORP	14- 29	25	[illegible]	[illegible]
O	NETWORK SYSTEMS CORP	15- 39	[illegible] 3/8	[illegible]	[illegible]
O	OMEX	3- 8	3	[illegible]	[illegible]
N	PARADYNE CORP	24- [illegible]	17 [illegible]	+ 7/8	[illegible]
A	PENRIL CORP	7- 12	9 7/8	- 1/8	[illegible]
A	RAMTEK CORP	12- 20	15 1/2	+ 1/2	[illegible]
N	RECOGNITION EQUIP	4- 10	9 1/8	+ 1/8	[illegible]
O	SCAN DATA	1- 5	1 1/8	[illegible]	[illegible]
N	STORAGE TECHNOLOGY	16- 44	21 3/8	[illegible]	[illegible]
O	SYKES DATATRONICS	6- 34	11 3/8	[illegible]	[illegible]
A	T BAR INC	[illegible]- 11	9 3/8	+ 1/2	+5.8
A	TEC INC	4- 12	9 5/8	-1	-9.4
N	TEKTRONIX INC	34- [illegible]	[illegible] 3/4	+2	+3.4
N	TELEX	5- 29	21 3/4	+ 1/4	+1.1
O	TESDATA SYSTEMS CP	3- 10	6 3/8	+ 1/2	[illegible]
A	TIMEPLEX INC	7- 18	18 1/4	+ 1/4	+1.3
O	VISUAL TECHNOLOGY	9- 17	15 1/4	0	0.0
O	WILTEK INC	1- 3	1 3/8	+ 1/2	+36.3

SUPPLIES & ACCESSORIES

EXCH		1982-83 RANGE (1)	CLOSE JAN 5 1983	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN BUS PRODS	11- 19	16 7/8	0	0.0
O	BALTIMORE BUS FORMS	1- 2	1 1/4	[illegible]	[illegible]
N	BARRY WRIGHT	13- 22	19 1/8	[illegible]	[illegible]
O	CYBERMATICS INC	1- 1	7/8	0	0.0
A	DUPLEX PRODUCTS INC	12- 21	17 1/4	- 1/4	-1.4
N	ENNIS BUS. FORMS	18- 30	26	0	0.0
N	3M COMPANY	49- 79	73	-3 1/4	-4.2
N	MOORE CORP LTD	26- 42	41	0	0.0
N	NASHUA CORP	9- 19	10 5/8	+ 1/2	[illegible]
O	STANDARD REGISTER	22- [illegible]	[illegible] 1/2	[illegible]	[illegible]
A	TAB PRODUCTS CO	12- 25	20 7/8	+1 3/8	[illegible]
N	WALLACE BUS FORMS	22- [illegible]	45 1/4	+ 1/4	+0.5

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The DP Job Market

One Study Sees Prospects Flourishing. . .

By Paul Gillin
CW Staff

NORTHFIELD, Ill. — Despite the sluggishness in DP hiring caused by last year's recession, the data processing job market will flourish in coming years, the "1983 Computer Salary Survey" released this month by Source EDP Personnel Services, Inc. here predicted.

However, DP salaries barely held the line with inflation in 1982, a marked departure from the meteoric rise they enjoyed during the late '70s, a comparison of Source EDP salary figures shows.

For example, the median salary for an entry-level programmer rose to $20,000 in 1982 from $19,200 the previous year, an increase of 4%. Experienced data base specialists, who topped the salary list for nonmanagers, also saw a 4% median rise.

In the managerial ranks, operations managers at small installations saw their median income rise less than 1%, from $26,900 to $27,100, the survey revealed. Even for directors of large in-

(Continued on Page 8)

Second Hints Tough Times to Continue

By Susan Blakeney
CW Staff

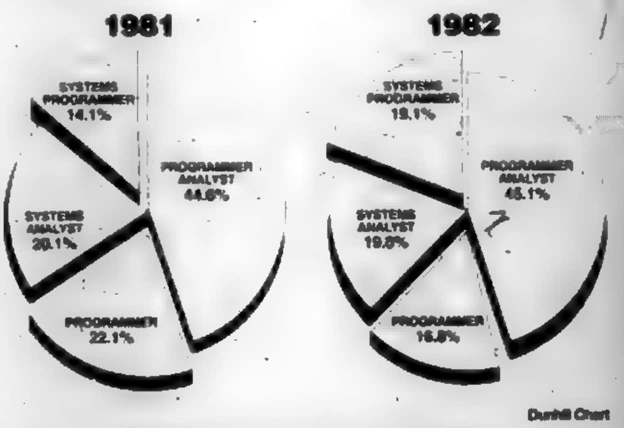
NEW YORK — For entry-level programmers, 1982 was the year when job hunting changed from a creative challenge to an uphill battle. Experienced programmers who were job shopping also had their share of difficulties as they faced fewer opportunities, stiffer competition and lower salary increases.

But for DP executives or managers looking to hire, 1982 was the first year in a long time that they could afford the luxury of hiring in batch rather than real time, compare qualified candidates and consider such things as communication skills, promotability and personal chemistry.

Those were the findings of a recent DP labor study from Dunhill Personnel System, Inc., a major national recruitment firm based here. The research was conducted under the direction of Rick Kean, who oversees Dunhill's 248 DP personnel consultants located across the U.S.

According to the sur-

(Continued on Page 8)



Dunhill Chart

Figure 1: Percent of Total Salaries

Where the Surveys Disagree, Concur

By Paul Gillin
CW Staff

The employment outlook for the DP industry of the 1980s is either poised for takeoff or racked with uncertainty, depending upon which recruiter you trust.

The "1983 Computer Salary Survey," published by Source EDP Personnel Services, Inc., sees demand increasing for DP professionals in virtually every area. Opportunities will be widespread in the areas of commercial, engineering and systems software programming, data base design and telecommunications, the study maintains.

But a similar survey made by Dunhill Personnel System, Inc. called 1982 a tough year for DP job seekers and hinted that 1983 may not be much better. According to the Dunhill study, experienced programmers discovered that competition for jobs had increased dramatically as DP growth slowed to a crawl. DP managers found themselves with fewer jobs to fill and an ever-increasing pool of applicants from which

(Continued on Page 6)

Mathematica Updates Its Ramis II DBMS, Unleashes CICS Rival

By Paul Gillin
CW Staff

PRINCETON, N.J. — Mathematica Products Group, Inc, last week introduced enhancements for its Ramis II data base management system.

At the same time, the vendor unveiled Atlas, a data communications monitor designed to compete with IBM's CICS. The monitor reportedly manages the execution of application programs through operating system multitasking.

Ramis II runs on IBM and plug-compatible systems in VM, MVS, OS/VS1 and DOS/VSE environments. Release 83.1 (the first release of Ramis in 1983) includes separately priced screen-formatting and relational model tools and reporting extensions which are incorporated into the basic package.

The updated Ramis includes a Formatted Screen Manager that allows more flexibility in the use of Ramis II for on-line application development, Mathematica said. FSM can be used for the design and testing of screens and for data entry.

Screens are defined by first painting layouts and then specifying field attributes via menus. Data maintenance is carried out in conjunction with Ramis II Records Management, ultimately allowing users to validate and process transactions and to add, update and delete records.

Also part of the new Ramis release is Relate, a tool for dynamically combining data from multiple sources including Isam, Vsam and Qsam files, IMS, DL/1, Cul-

(Continued on Page 12)

BOCs Take Wraps Off Net Services

By Phil Hirsch
CW Washington Bureau

ORLANDO, Fla. — The first two data network services the Bell operating companies will offer after they are divested by AT&T were officially unveiled here last week at a seminar sponsored by the International Communications Association (ICA). They are a local-area data transport service and a 56K bit/sec circuit-switched service.

The local-area data transport service will support simultaneous voice and data transmission over the Bell operating companies' existing local-loop network between the user's site and a backbone packet-switching network, according to Robert Polsen, staff member of a central organization recently

(Continued on Page 14)

DP Shop Reshapes Itself — In Only Four Months

By Lois Paul
CW Staff

FRAMINGHAM, Mass. — The move toward an integrated manufacturing system started a chain of events at the Dennison Manufacturing Co. here that led to a hardware conversion, the installation of a new operating system, the addition of a new data base management system and the addition of a manufacturing software package — all in a four-month period.

In late October, the 100-year-old manufacturer of office supplies for the home, office, schools and industry got the nod from corporate management to install new manufacturing system software. In the process, it began a major project — scheduled for completion next month — to update its core data processing system, explained Gary Lee Kelley, management information systems education coordinator for Dennison.

To install an integrated manufacturing system, Dennison needed more computing horsepower. That pointed the DOS shop to-

(Continued on Page 6)

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Please address all correspondence to the appropriate department at Box 880, 375 Cochituate Road, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153.

OTHER EDITORIAL OFFICES

New York: Suite 7G, 401 East 60th St., New York, N.Y. 10021, Phone (212) 570-2135

West Coast: 257 Lytton Ave., Palo Alto, Calif. 94301 Phone: (415) 328-8064.

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England: [illegible] London EC1V [illegible]

W. Germany: [illegible] Munich 40 [illegible]

France: [illegible] Le Monde Informatique 42 Avenue Montaigne, 75008 Paris [illegible]

Japan: [illegible] Computerworld Japan [illegible] Tokyo [illegible]

Australia: Alan Power, Computerworld Pty. Ltd. [illegible] NSW 2065 [illegible]

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But Award Must Be Reconsidered

MCI vs. AT&T Verdict Upheld

CHICAGO — AT&T's multiple violations of the Sherman Antitrust Act between 1969 and 1975 were confirmed here last week when the U.S. Circuit Court of Appeals upheld a federal district court verdict in a case brought by AT&T's chief competitor, MCI Communications Corp.

However, the lower court was told to reconsider its $1.8 billion treble damage award to MCI, the largest in history.

MCI's suit, filed in 1974, was decided initially in 1980, when the district court concluded that AT&T had committed 10 of the 15 violations charged by MCI. Eight of those 10 charges were upheld by the court.

A complaint that AT&T's "Hi-Lo" private-line tariff included predatory prices was rejected, for example, but the appeals court ruled that AT&T, by not letting MCI interconnect with the telephone network, had violated the Sherman Act and that the phone company had failed to comply with specific court and Federal Communications Commission orders requiring it to interconnect.

One month before last week's appeals court decision here, a federal district court in Washington, D.C., after considering similar charges filed by Southern Pacific Communications Co., found that AT&T had not violated the Sherman Act. About 50 antitrust cases are now pending against the phone company.

The big question at the moment is how much AT&T will be fined. MCI chief William McGowan said that since AT&T eventually provided the interconnections that led to the suit, it shouldn't be difficult to determine how much revenue the company lost while the suit was pending.

The day before the appeals court decision, MCI announced record earnings and revenue; during the first nine months of its current fiscal year, revenue totaled $741.8 million, compared with $341.6 million for the year-earlier period.

AT&T said it was "pleased" with the decision because "the heart of the case, the pricing issue, has been thrown out. What remain are minor matters."

'Apple Bill' Reintroduced For Vendor Tax Deductions

WASHINGTON, D.C. — The so-called "Apple Bill," legislation to provide a tax deduction for firms donating computers to elementary and secondary schools, has been reintroduced in Congress. Its sponsor has pledged a concerted effort to enact it.

Rep. Pete Stark (D-Calif.), who reintroduced the Computer Contribution Act Jan. 6, promised he and other congressional supporters of the bill will make "a major new effort" to get it through the new Congress. The legislation, partly the brainchild of Apple Computer, Inc. Chairman Steve Jobs, easily won approval in the House of Representatives last year, but was held up in the Senate, where it was attacked as a special interest measure aimed at benefiting a select few computer manufacturers.

When the bill was first introduced in early 1982, Jobs said his firm was prepared to donate more than $200 million worth of computer equipment to 75,000 elementary and secondary schools if the increased tax deduction was granted. The bill would provide firms with a special tax deduction equal to the cost of manufacturing plus one-half the usual markup of computer equipment donated during one year, 1984.

The deduction is the same as that now available for scientific equipment donations to colleges.

Corrections

The final paragraphs of "Firm Expands System, Solves Data Entry Woes" in the November Special Report [CW, Nov. 29] were inadvertently omitted. They noted that O.R. Systems, Inc. eventually decided to buy ECS 4000 series terminals manufactured by ECS Microsystems, Inc. of San Jose, Calif.

Prices for the Bits family of software modules offered by Boeing Computer Services Co. [CW, Dec. 6] start at $300.

This Week

IN DEPTH

The Greening of Silicon Valley ......Follows Page 56

NEWS

Ways to Measure Productivity Still Inadequate 4
Mainframe Shop Ventures Into Micro Territory 5
Product Spotlight: Voice Recognition Systems 10
Fewer Firms Developing Voice Systems: IRD 11
House Asks Delay of Surveillance System 13
AT&T Tariff Cuts International Rates 14
ICA Seminar Ponders Intracity Networks 15
PBXs Seen Vital to Data Communications by '88 ..16
MIS Managers Say DP Planning a New Game 17
SSA Data Center Move Wins 'Golden Fleece' 19
Meet Slated on IBM Strategies 20
Mass. Finds Way to End Pensions for the Dead ...21
GSA to Help FAA Speed Up System Purchase 22
Reorganized Air Traffic Controllers Still Vocal 23
Developer Credits Sales to Portable Terminals 24
Turnaround Time 26
Transit System Goes On-Line, Now on Time 27
Managers on the Move 28
Warehouse Firm Racks Up Profits With System ...30
Control Package Helps Ski Manufacturer Glide 31
Tech Seen Causing Uncertainty Among Execs 33
Researchers Tackling Football Injuries With DP ...35

EDITORIAL

Editorial: Think Twice 36
Softline: Natural-Language Syntax Schemes 37
Human Connection: DP's Future Rank and File ...37
Reader Commentary: Sitting Through a Seminar ..38

SOFTWARE & SERVICES

Insurer Ends Outage Problems With 'Dads' 39
'VSEE' Targets IBM DOS/VSE 40
Data 21 Enhances RPF Package 41
Noesis Announces Packages for HP 3000 Users ..42
Quasar's 'Powerhouse' Announced for HP 3000 ..44
Fortran 77 Source Program Released for Apples ..45
DBL/VMS Version Out 46
'Convert' Out for DEC Ascii, IBM Ebcdic 47
Wang VS Family Gets Cobol Package Update 48
Screen Handler Debuts for HP 3000 Users 49

COMMUNICATIONS

DPers Will Take Control of Info Nets: Exec 51
Package Helps Micro Emulate CPU Terminal 52
Bridge Users Get Phonelink 53
Terminal Allows Users to Reconfigure System 54
CS11, CS21 Mux Series Enhanced 55
Graphics Package Out for VT100s 56

SYSTEMS & PERIPHERALS

Harris DDP System Out 63
HP Adds On-Site Service to Repair Options 64
Unibus Repeater Introduced 65
Disk Controller Out for Apple II 68
Remote Storage Unit Bows 70
Card Packages Out for IBM Personal Computer ...72

OFFICE AUTOMATION

USPS, Justice Tag Raytext Cumbersome 73

COMPUTER INDUSTRY

Services, Product Sales Predicted Up 18% in '83 ..79
Justice Will Not Challenge Formation of MCC 79
Magnuson Drops Project 80
Thirteen Firms Push for Tape Drive Standard 82
Report Predicts Local Systems Mart Shake-Up ...83
CA Offers Trade-In on IBM 8100s 86
Massport OKs Foreign Trade Zone for High Tech ..88
Study: Field Service Thrives 90

ADVERTISING INDEX 116

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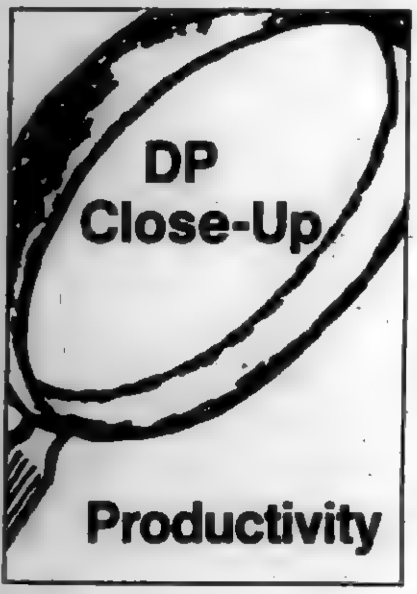
Ways to Measure Productivity Still Inadequate

By Paul Gillin
CW Staff

It has been more than three years since productivity first became a favorite and much-defined data processing buzzword, but no one has yet come up with an adequate method to measure it, according to DP managers and analysts interviewed recently by *Computerworld*.



Moreover, the problem has been heightened in recent years by the infusion of such software productivity aids as high-level and nonprocedural languages and application generators. These labor-saving tools have made obsolete those measurement techniques that rely on counting lines of input or output, experts said.

"There's no such thing as an effective [productivity measurement] system. I can't even dredge up a suggestion," said Peter Lamasney, president of Smallframe Systems, Inc., a San Francisco systems house.

No Reasonable Technique

"We don't have a technique we accept as even reasonable," said Richard Streebel, technical consultant in financial services at Associates Bancorp, Inc. in South Bend, Ind. "The closest measure we've got is user satisfaction."

In the past, one popular productivity measure involved counting lines of code. However, with high-level languages cutting those figures by 75% to 90% in some cases, hard-number measurements can skew averages toward the programmer who writes a great many lines of code.

At the other extreme, evaluation techniques that rely upon the volume of programs produced may favor the programmer who writes many simple routines using productivity aids. "We've got some small programs that are absolute bears and large programs that we can give to trainees," said William Bell, department director for systems development for the commonwealth of Virginia's Department of Management Analysis and Systems Development.

In the meantime, it seems there are as many forms of productivity measurement as there are DP shops. Small operations favor informal techniques, while large shops often use complex and sophisticated mathematical tools. DP managers interviewed admitted that their methods of evaluating programmer productivity are homegrown in general and merely adequate at best.

"It's something we're all very concerned about and working on," said Larry Crosman, vice-president of systems and programming for John Hancock Mutual Life Insurance Co. in Boston.

No Definitive Method

"We don't have a really definitive method. We look at a variety of numerical and objective factors, including scheduling, use of tools, comments from users and ease of maintenance," Crossman said.

In order to use an informal evaluation system for his crew of 27 programmers, Jim Hodges of Merrell Dow Pharmaceuticals in Houston breaks projects into segments, sets deadlines for each and measures success in meeting the schedules. Although initially awkward, the method has proven reliable even after productivity enhancements were installed.

"We've been working on it for the last year," Hodges said. "Our estimates weren't that good at first, but they've gotten better, and we believe the end result is a better measure for productivity. This method has also helped us to decide whether to use productivity aids."

After evaluating line-of-code and other quantitative measurements, Bell's 112-member department developed T^3, an algorithm that compares total resources consumed by a project against an assumed average.

"Our method concentrates not on output units as much as upon measuring actual expenditures against budgeted expenditures," he said. "We haven't found anything we prefer over T^3."

But Bell's shop encountered problems recently when several productivity aids were installed, including DMS from IBM, Information Builders, Inc.'s Focus and Management & Computer Services, Inc.'s Promacs. "T^3 pretty much goes out the window when we start dealing with productivity tools," Bell said. "We're now using T^3 and a lot of judgment."

Authorities still debate whether productivity measurements are necessary or accurate without similar indicators at other levels of the process. "The whole concern about programmer productivity is misplaced," Lamasney said. "Analysts take all kinds of shortcuts. Therefore, it's falling on the programmers to make key decisions. Recycling and editing is being reported as programming."

National Semi Stockholders Say Company Overstated Earnings

By Bill Laberis
CW Staff

PHILADELPHIA — National Semiconductor Corp. has been hit with a class action suit alleging, among other things, that the company intentionally overstated pretax earnings by $32 million over a four-year period.

The suit was filed in U.S. District Court here on behalf of company stockholders who, in three separate allegations, charged that certain company actions from 1977 through 1981 falsely inflated the value of National Semi's stock. The stock's value eventually fell, causing some investors to lose heavily, the plaintiffs will try to prove.

A spokesman for National Semi said there "is absolutely no merit in the suit." His company will file a complete reply to the charges by the end of January, he added.

The stockholders' suit seeks damages commensurate with the aberrations in National Semi's stock value caused by the company's alleged wrongdoings, according to a spokeswoman for Greenfield & Chimicles, the Bala Cynwyd, Pa., law firm handling the plaintiff's case. These damages are expected to be substantial.

Stock market analysts and other securities specialists will reportedly be called to testify in assessing the exact impact National Semi's alleged wrongdoings had on the stock's value, the spokeswoman said.

In the suit, stockholders contend that National Semi overstated revenues and pretax earnings in each year from 1977 to 1980. They claim the company overstated as much as $12 million in pretax income in 1980 alone, while overstating revenues by $16.4 million. National Semi accomplished this in part, the suit holds, by including sales to some distributors as complete sales when certain of the sales were not complete.

The second of three allegations charges that National Semi defrauded the federal government in the late 1970s by supplying the military with substandard microcircuits for weaponry and communications systems, thus causing the company to be dropped from certain government-qualified parts supplier lists.

Another result of the company's actions vis-a-vis its military contracts is that it is now the subject of a federal grand jury investigation, the suit maintains.

The third allegation charges that National Semi was involved in the theft of trade secrets from IBM. This charge is directly related to the suit filed by IBM that implicated National Semi in an alleged Japanese plot to steal trade documents [CW, Sept. 27, 1981]. Hitachi Ltd., the central defendant, and National Advanced Systems, Inc., a wholly owned subsidiary of National Semi, were also named in that suit. All three defendants in this case have denied IBM's charges.

Complaints and pleadings in the class action suit against National Semi must now be heard before a U.S. District Court judge, who will first decide whether the case should be heard as a class action suit or as a suit brought by individuals.

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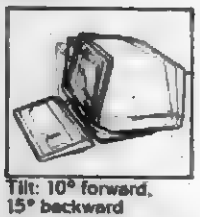
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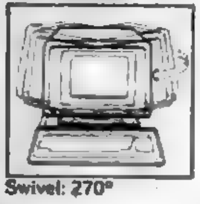
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One of First 'Omnicalc' Users

Mainframe Shop Ventures Into Micro Territory

By Lois Paul
CW Staff

HUNTINGTON BEACH, Calif. — How do you keep your DP managers from having to use paper and pencil to figure out their budgets, short of bringing in 20 microcomputers that support electronic spreadsheet packages?

This was the problem faced by Mark See, manager of technical support and operations for Wyle Data Services, an IBM mainframe-oriented shop with a 500-terminal CICS network. See's solution was to arrange for his firm to become one of the first users of Omnicalc, an electronic spreadsheet package designed for IBM and plug-compatible CICS-based mainframes. Omnicalc was introduced last month by Tower Systems, Inc. of Irvine, Calif. [CW, Dec. 20].

"We were trying to look for new systems for users and programmers to help in day-to-day operations," See said. One of the goals was to obtain help in doing "rudimentary exercises such as budget analysis and forecasting. I wouldn't be surprised if I spent four to six man-weeks last year doing budget preparation, and most of it was just erasing and changing numbers.

"What happens frequently in DP is that we don't take advantage of the kind of technology that we try to provide for our users," he said. He recalled that because of the economic situation last year, he was forced to revise his budget about eight times. "Each time I had to pull out my 13-column accounting pad. It would take me a week of erasing and recalculating to come up with a new budget," he recalled.

See's Alternatives

See has used Visicorp's Visicalc spreadsheet software on a microcomputer, but did not want to recommend this product on a wholesale basis to meet his firm's needs. "That didn't seem to be an alternative because we have an IBM 3033 out there, a $4 million machine, and [I would have had to ask my firm] to buy 20 more computers. I wanted to take advantage of the equipment and expenses our company has already incurred."

Another reason he decided to go with a large mainframe-based spreadsheet package was the problems that remain when users of a microcomputer attempt to exchange data with a host system. "The technology just isn't there," he said. "We have a huge DL/1 data base and 8M bytes of disk space, none of which we can easily get to and from the mainframe." His feeling was that if Omnicalc was developed correctly, it would evolve to a point that interfaces to host systems would be easily achieved with future releases of the product.

Currently there is only one IBM Personal Computer at Wyle Data Services, and its user has had to key in manually any data from the micro that he wants to manipulate on the mainframe. "You want to be always in the position to try and share data," See explained. "Omnicalc has passwords so people can't get at the work you are doing. Yet if you want to, since everyone is on a common network of CICS, you can instantaneously, automatically have the ability to share information as opposed to trying to mail floppy disks all over the place."

Wyle Data Services, which provides data processing services for Wyle Electronics, has used tape and disk management packages from Tower Systems in the past. See said that it was the relationship with the firm and the good experience with previous products that led him to agree to be a first user of Omnicalc. The firm's CICS made Omnicalc "a natural fit for us," he said. "I could literally, on a day's notice, have 500 people taking advantage of it."

See began "pioneering" the use of Omnicalc at Wyle Data Services two months ago. "I am loading my budget information — all of the software budgets and all of the hardware — on there now and building formats. The other managers are constantly looking over my shoulder, seeing what I am doing, because they have got 13-column sheets they are working on.

"I wanted to get on board with it and get any problems out of the way before I turn it loose," See said, noting that he has not had any problems to date. Omnicalc will be offered first to the management staff in the computer facility, then to all of the firm's executives and business analysts.

Although the software is command- rather than screen-oriented, See does not anticipate any difficulty training users on Omnicalc. He said most of the commands are pretty basic. "I think I can set up a one-hour demonstration and walk thorugh it and then with the documentation they will have no problem," he said.

Tower Systems did not come out to train See on Omnicalc. "I brought it up and read the manual one night while I was watching TV and I'm doing it. It is not that difficult."

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Dennison Reshapes DP Shop in Four Months

(Continued from Page 1)

ward a switch from its current IBM 4341 Group 1 and Group 2 mainframes to an IBM 3033 (see story at right). But to run an IBM 3033 most efficiently, the firm was told it needed the MVS operating system.

The selection of the manufacturing package, the Product and Inventory Optimization System (Pios) from Rath & Strong Systems Products, Inc. of Dallas, prompted another conversion. Pios interfaces directly to Cullinane Database Systems, Inc.'s IDMS data base management system (DBMS), but Dennison was running Cincom Systems, Inc.'s Total and IBM's DL/1 DBMS..

Dennison has six operating divisions that are basically autonomous but supported by a number of core service groups such as Accounting and Personnel. Raw materials are shared by many divisions and certain services, such as purchasing, are handled over-all divisions.

So when Dennison — which had been running a largely homegrown manufacturing system — decided it needed new manufacturing software, it began looking for a system that could handle manufacturing operations in a multidivisional mode as well as integrated material requirements planning that could overlap all divisions. The company reviewed a number of packages, including offerings from Comserv Corp., Martin Marietta Data Systems, Inc., Walker Interactive Products and Arista Manufacturing Systems.

The package that seemed to fit the bill most closely was Pios, even though it required the switch to IDMS. "Because of the broad scope of the Rath & Strong package, we deemed it to be worthwhile for us to change our standard for data base systems," according to Dennison's Gary Lee Kelley. Pios handles basic accounting, personnel, scheduling, order inventory, material requirements planning and cost control.

The entire package — hardware, operating system, DBMS and manufacturing software — was rolled into one package for one big conversion that would run about $22 million. Hugh A. McGlinchey, Dennison's manager of administration, research and engineering, said, "I am always impressed with the resilience of human beings. In Technical Services, people were faced with both a new DBMS and a new operating system in a few weeks."

The firm decided to handle the bulk of the conversion with its in-house staff and not resort to outside help except for vendor support. "Having been on the other side of things, there was no way I wanted to go back to our users and say, 'We have the greatest people in the world working on it, but they will come back in a week. Be patient.' Plus, my own people spilled a lot of blood putting this in. It became a very personal cause to us," McGlinchey recalled.

The only increase in staffing has occurred in Technical Services, which has grown from a three-person to a five-person group since the conversion.

McGlinchey speculated that Dennison people have spent about 2,140 hours on the conversion. Weekly meetings involved all of the individuals working on the then-current phase of the conversion — which could range from systems specialists to manufacturing people to the people cutting tiles in the floor to install the new equipment.

IBM provided an impressive level of support, McGlinchey said. The MVS operating system was generated through IBM's MVS Express system at the vendor's Dallas Technical Center. "You go down with empty tapes and, based on what you want to do, you generate MVS and take the tapes back to the office," he explained.

Dennison expects to bring up MVS before the end of the month. "We are doing fine-tuning before it will be officially available," McGlinchey said. "We will then bring up the manufacturing package and IDMS in early to mid-February," he added.

Kelley has trained all of Dennison's computer operators on MVS during the past two months. Training on IDMS will take place through the next month. Additional training will be handled on an as-needed basis.

Santa Heard Its Prayers

By Susan Blakeney
CW Staff

FRAMINGHAM, Mass. — Dennison Manufacturing Corp.'s computer system magically appeared this Christmas, and everything in the big blue boxes worked right off the bat.

Not bad for a last-minute request to Santa, considering that corporate management did not give the green light until Oct. 27 to convert from dual IBM 4341 computers to an IBM 3033 system before the start of 1983.

"The six operating divisions of this company are supported by a number of service groups," explained Hugh McGlinchey, manager of administration, research and engineering for the for the multimillion-dollar maker of office supplies. "We sat down over a year ago to figure out how we would be able to plan for future expansion. The MIS [management information systems] department came up with a system plan and we got the green light in October."

The 3033 installation, which included the installation of several IBM 3375 disk drives and VSE Release 3.0 to support the 3375s, is increasing Dennison's computer capacity from 2.13 million instructions per second (Mips) to 4.8 Mips, McGlinchey said. In direct-access storage device capacity, Dennison leapt from 6G to 15.9G bytes.

The company considered converting to a distributed data processing system, but "we decided we're taking a big piece of pie as it is," said Gary Kelley, Dennison's MIS education coordinator. "We were able to more than double our capacity with the 3033 for about the same cost as getting increased disk capacity."

Dennison did not have time to perform parallel processing in its implementation of the 3033 — the new machine no sooner came in the door than the old ones were gone. "They were already sold. We had to get rid of them before Dec. 31," McGlinchey explained.

McGlinchey admitted the timing of the hardware conversion was frenetic — nine weeks from start to finish. The reasons: a combination of an IBM price break, Dennison's budget schedule plus the fact that "we had raised everyone's expectations of the new system, and were afraid if we didn't go ahead right away it would be hard to retain people's interest and motivation," which were needed to support the conversion.

Up came the tile floors and in came the power lines, cables and new cooling system, requiring a seven-day week for many Dennison employees and the movement of lots of bricks and mortar. But the conversion went off without a hitch. "If it had snowed we would have had problems, but even the powers-that-be cooperated," said McGlinchey, referring to the unusually mild winter and the elaborate water-coolant piping that had to be installed on one of Dennison's roofs to cool the 3033.

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Surveys Disagree, Concur

(Continued from Page 1)

to draw.

In contrast with the Source EDP study, which found that "more alternatives are open to commercial programmers and programmer analysts than any other group," respondents to the Dunhill survey showed a 20.8% decrease in hiring for programmers in 1982.

And the Dunhill survey report highlighted a new feature of DP job-hunting that did not make the Source EDP list: DP managers are scrutinizing personality and organizational factors more closely than ever in making hiring decisions. For DPers just entering the market, that means technical expertise and a planned career path are no longer a guaranteed path to success in the DP environment.

On several other points, the surveys agreed:

- The market is growing for professionals who can support data base and data communications technologies.
- Average DP salaries will continue to outpace inflation, but at a slower rate than was found in the previous decade.
- Demand for system programmers is likely to remain hearty — but just how strong is another point of contention. While Source EDP forecasts "strong demand across a broad front" for systems programmers, the Dunhill study found that job market is industry-dependent. Systems programmers in banking and machinery polled big increases in 1982, Dunhill noted, but increases were considerably smaller for systems programmers who worked in business services and insurance.

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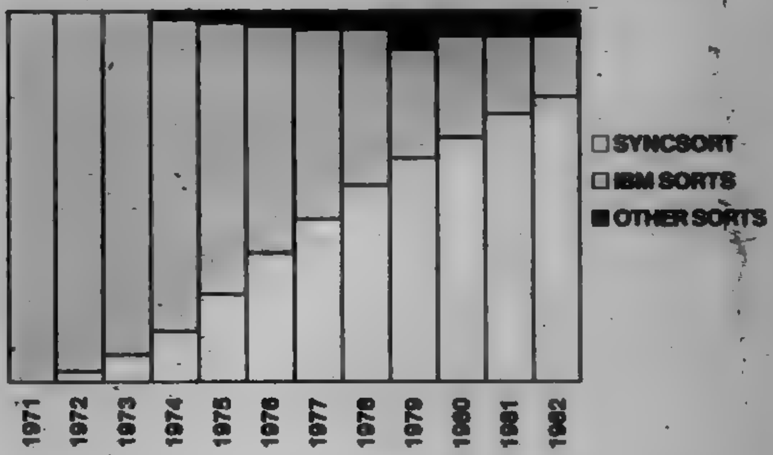

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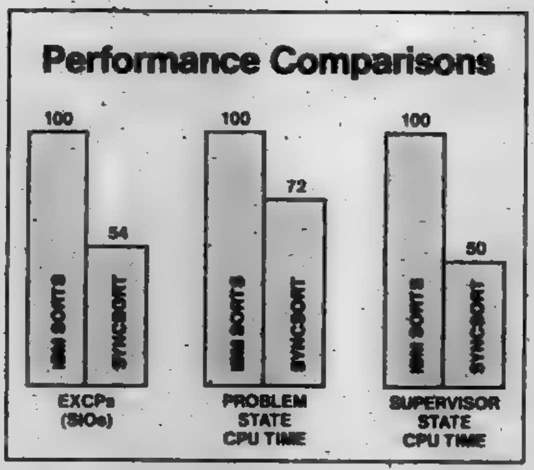
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*According to IDC's Sixth Annual Survey of Sort Programs Used in IBM OS and OS/VS Environments

Job Market to Flourish, Source EDP Concludes

(Continued from Page 1)

stallations, salaries went up less than 6%.

The Source EDP survey, based on data drawn from an analysis of 50.000 individual clients, predicted that DP professionals with managerial experience will see increased demand for their skills and upgrades in their levels of responsibility.

For information systems directors in particular, "demand will remain relatively high as intermediate and smaller organizations continue to upgrade."

Information systems directors fared well in the survey's professional compensation data for managers. Source EDP found that the director of a large DP shop earns a median salary of $60,300, with the top 15% bringing home nearly $90,000 annually.

In contrast, the director of a small installation earns a median income of $40.600.

Data base specialists lead the nonmanagerial ranks in terms of salaries, according to survey findings. A data base specialist with more than four years of experience makes a median income of over $40,000.

Demand for those professionals will increase because of growth in the number of installed data base management systems in coming years, the report predicted. Data base specialists with experience in a major Codasyl or hierarchical data base package, a knowledge of communications or distributed systems and a knowledge of relational data bases are expected to fare best in the job market.

The outlook is also rosy for commercial programmers and programmer/analysts in nearly every area. Those in highest demand will have experience in large operating systems, job control languages, data base management and direct access techniques, remote processing, virtual systems, CRT terminal drivers and data base handlers, according to Source EDP.

While starting salaries currently settle at about $20,000 for entry-level commercial programmers and programmer/analysts, those with more than four years of experience can earn well over $30,000, the survey reported.

However, to make the biggest salaries in nonmanagerial positions, DPers should specialize, the survey indicated. Professionals in the user environment should become familiar with distributed processing, networking and communications. Professionals seeking new opportunities should look to the burgeoning minicomputer and microcomputer markets and to service organizations.

Demand is increasing for engineering/scientific programmers, minicomputer and microcomputer programmers, systems software programmers, data base specialists, telecommunications programmers and electronic DP auditors. Median salaries hover in the $30,000 range for most, with senior analysts and consultants making $56,000 and up in some companies.

Source EDP projected that fast future growth will occur in the fields of computer-aided design and manufacturing. About 50,000 jobs will be created in the robotics industry in the next 15 years, and the demand for computer professionals to design and program the new automation will be intense.

Technical service and systems and programming managers fall in about the same salary range, the survey showed, with the median level varying from $38,000 at small installations to nearly $50,000 at the largest shops.

Of all managers, those in operations earn the least, the survey found. The median figure is $40,500 for those at large installations and just over $27,000 at small shops.

The survey is available free from Source EDP at Suite 227, 2 Northfield Plaza, Northfield, Ill. 60093.

Dunhill Says 1982 Year of Real Changes

(Continued from Page 1)

vey. DP departments enjoyed regular and rapid growth from 1976 to 1981. Systems configurations, budgets, titles, salaries and salary increases got bigger and better every year.

With the recession in 1982, however, DP opportunities simply stopped growing and several major shifts took place in the nature and composition of DP hiring practices. For example, the relative hiring share of the top four titles hired (also measured in total salaries paid) indicates that more hiring is occurring for higher level positions (Figure 1).

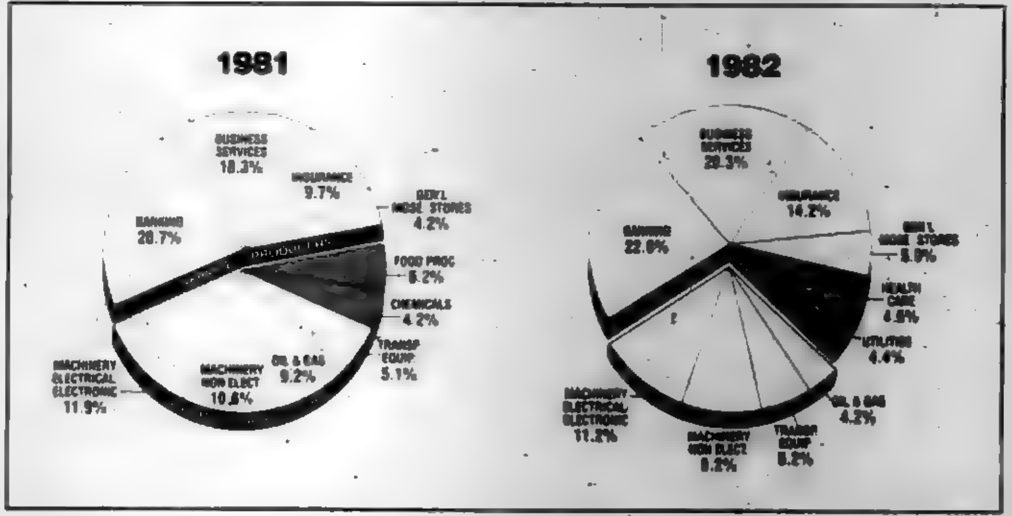
Programmer/analysts and systems programmers both gained in relative hiring share in 1982, while systems analysts and programmers both showed losses.

The most dramatic changes in relative demand were for systems programmers, with a 35.5% increase in hiring share in 1982, and for programmers, with a 20.8% decrease.

The reasons for these changes include increasing demands for internal support of data base and data communications and upgrades of operating systems, coupled with a trend toward hiring the functional generalist for application development environments, according to the Dunhill report.

Another change in 1982 compared with 1981 has to do with which industries are doing most of the DP hiring.

In 1981, information-intensive service businesses such as banks, utilities and insurance companies hired approximately half (52.9%) of all DP professionals. In 1982, however, this group claimed the lion's share of DP personnel with 71.1% (Figure 2).



Dunhill Chart

Figure 2: Hiring Action by Industry

Because of rocky economic times, all DP executives and managers involved in Dunhill's industry research admitted to exercising more selectivity in hiring than ever before.

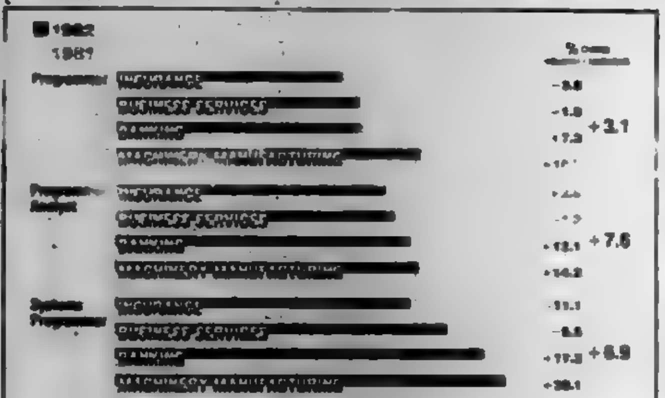
Technical Skill Not Enough

Basic technical skill was no longer enough to land a job. DP employers were in a position to expect more — and get it — from job applicants. Increasingly, as the year 1982 wore on, candidates at all levels were evaluated for problem-solving skills, their ability to get along with others and their "service" attitudes, the study reported. True to the temper of the times, job-hoppers were looked upon with less tolerance, and candidates were chosen for their past successes as well as their future potential.

Furthermore, hiring requirements became increasingly application- and industry-specific in 1982. DP executives often opted for the "plug-compatible" candidate that could be productive right away.

In addition, DP professionals across-the-board exercised much more caution in evaluating career options last year. As the market tightened, DPers began to look for evidence of corporate and departmental stability, Dunhill said.

Wherever possible, DP executives avoided relocation in 1982. The Dunhill report indicated this phenomenon was especially pronounced in the larger metropolitan areas, including Dallas, Chicago, Detroit, Boston, Los Angeles and New York, where the population of potentially qualified candidates was particularly high.



Dunhill Chart

Figure 3: Average Salaries of Computer Professionals Making Job Changes Within Selected Industries

Salary Increases Smaller in '82

NEW YORK — While DP salaries continued to move upward during 1982, average salary increases were much lower than in previous years. Some industries actually paid less for certain positions than they did in 1981, Dunhill Personnel System, Inc. found in its recent study of the DP job market.

Only two title/industry combinations (systems programmers in banking and systems programmers in machinery industries) produced average salary growth rates at anything close to the whopping 20% increases that set the industry reeling as late as mid-1982 (Figure 3).

Five categories that showed decreases were programmers in insurance companies, programmers in business services, systems programmers in insurance, systems programmers in business services and systems analysts in machinery.

Salaries did show an overall increase for all job titles, ranging from 3.1% for programmers on the low end to 7.6% for programmer/analysts on the high end. This range and a composite starting salary growth rate of 5.3% for all titles and industries are representative of the arrested growth rate in the DP industry in 1982.

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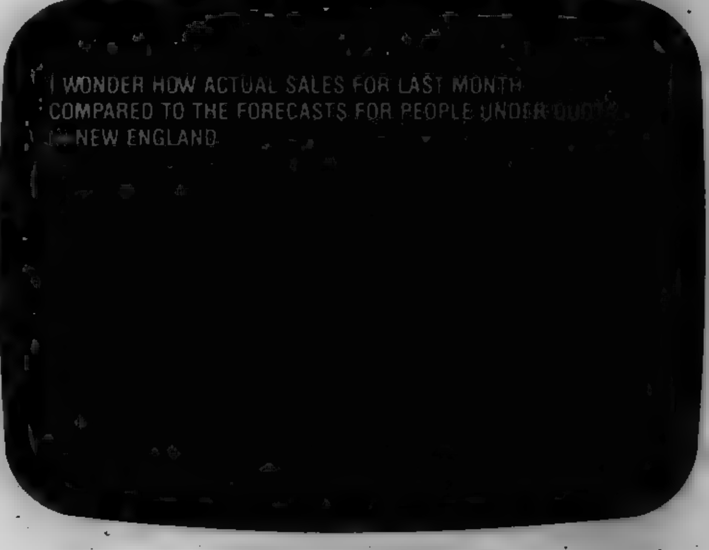

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COMPARED TO THE FORECASTS FOR PEOPLE UNDER QUOTA
IN NEW ENGLAND

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Executives don't have to wait for information, and the DP department is freed from having to respond to management's requests for reports. Tedious, repetitive report generation becomes a thing of the past.

Intellect isn't just for simple questions. The system can relate information from several files to respond to a query, so that a request doesn't have to be confined to a single file. Users can compare different sets of data with one question, as when comparing actual sales figures with projections. Managers make better decisions with all this information instantly available at their fingertips.

Many non-DP people think it's always been this easy to get information from a computer. That's why they get so frustrated when they discover that they have to learn a complicated formal query language in order to retrieve the data they need. If they have any experience working directly with a computer, they'll be amazed and relieved at how easy it is to use Intellect—even to get the answers to complex questions. Intellect makes the computer the easy-to-use tool it should have been long before now.

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For Commercial Users

Talking Computers Still Science Fiction

Product Spotlight

By Tom Henkel
CW Staff

In the now-classic *2001: A Space Odyssey,* author Arthur C. Clarke's vision of the future includes a computer that listens, understands and speaks, The machine — HAL 9000 — not only acts in response to spoken commands, but responds verbally and eventually outthinks its masters.

Unfortunately, while conversing computers are integral to most visions of the future, they are as much a part of science fiction today as they were a decade ago. While researchers have developed impressive voice synthesis devices, many say there is no immediate solution to the difficulty of programming computers to listen.

There are two major problems facing voice recognition technology, according to Steve Levinson, a staff researcher with Bell Laboratories' Acoustic Research Department in Murray Hill, N.J. First, scientists just do not know enough about how humans speak to develop a machine that can understand speech. Second, voice recognition products developed to date have been far from conversational.

Most speech systems require their human users to speak deliberately and sometimes unnaturally. This, Levinson observed, has led to an acceptance problem and lack of demand for voice recognition products. Consequently, lack of demand has stifled widespread research and resulted in voice recognition systems that do not work well enough, Levinson said.

Critics of voice recognition technologies point to one of the first experiments in voice recognition, conducted about 30 years ago at Bell Labs. In that experiment, a machine was taught to recognize isolated spoken digits. Aside from the replacement by silicon chips of the tubes and transistors used in that early experiment, voice recognition technologies have not really progressed much in the past 30 years, according to critics.

Vendors of voice recognition hardware, however, disagree with these assessments. Jeff Gruza, manager of marketing development for Threshold Technology, Inc., a leading voice systems builder, admitted that voice recognition techniques are not yet perfect, but the main problem is that users sometimes overanticipate the advantages of a recognition system. He claimed that many firms have successfully implemented voice recognition systems, and most have boosted productivity or have overcome a tough problem by switching to a voice recognition system.

Typical voice recognition applications include data entry, particularly in unusual or harsh environments, quality control and merchandise

(Continued on Page 12)

MANUFACTURER AND MODEL	Auricle, Inc. Auricle I	Centigram Corp. MIKE	Interstate Electronics VRC008/100-1	Interstate Electronics VRM041/102	Interstate Electronics VRT101	Interstate Electronics VRQ400
COMMUNICATIONS INTERFACE	RS-232-C & IEEE 488	RS-232-C, parallel	Parallel	Parallel, RS-232-C, 20 mA	Two RS-232-C ports	DEC Q-Bus
PROCESSING FACILITIES						
Type	Z-80	Z-80	NA	NA	Dual Z-80	NA
Main memory	16K RAM	48K RAM, 4K EPROM	External RAM	RAM, ROM	48K RAM (CPU)	RAM, ROM
Software	Firmware	Proprietary	Firmware	Firmware	VOICE (proprietary)	Firmware
SPEECH CHARACTERISTICS						
Recognition technique(s)	Spectral analysis, pattern recognition	Spectral analysis, word framing, pattern generat.	Voice pattern waveform analysis, template match.	Pattern generation, pattern matching	Pattern generation, pattern matching	Pattern generation, pattern matching
Maximum number of speakers supported	Unlimited	1	1	1	1	1
Maximum number of voice references stored	Unlimited	96 words	8 (VRC008), 100 (VRC100-1)	40 (VRM041), 100 (VRM102)	100	100
Handle continuous speech?	No	Yes, phrases	No	No	No	No
Percent recognition accuracy	99	NA	90(VRC008),99+(VRC100-1)	99+	99+	99+
Average response time	Less than 1 sec.	NA	200 ms (VRC008), 250 ms (VRC100-1)	65 ms (VRM041), 125 ms (VRM102)	125 ms	125 ms
Additional characteristics	—	Voice response capability	VRC008 speaker inde., both sys. are chip sets	Both board level systems	Fully self-con. intell term. with voice recog.	Single-board unit for DEC VT103 and LSI-II
TYPICAL APPLICATIONS	Development system for OEMs	Data entry, control functions, file inquiries	Data entry, inven. con., consumer systems, toys	Data entry, inven. con., consumer systems, toys	Data entry, inventory control	Data entry, inventory control
PRICING, AVAILABILITY, AND SERVICE						
Purchase price	$2,480	$1,900 to $3,850	Contact vendor	Contact vendor	Contact vendor	Contact vendor
Monthly rental	—	Contact vendor	Contact vendor	Contact vendor	Contact vendor	Contact vendor
Monthly maintenance	—	Contact vendor	Contact vendor	Contact vendor	Contact vendor	Contact vendor
Quantity discounts	No	NA	NA	NA	NA	NA
Product delivery ARO	Threshold	Contact vendor	NA	NA	NA	NA
Training provided by	Threshold	Centigram	NA	NA	NA	NA
Service provided by	Threshold	Centigram	NA	NA	NA	NA
Number installed	50	NA	NA	NA	NA	—

Datapro Research Corp. Chart

MANUFACTURER AND MODEL	NEC DP-200 CSR	NEC SR-100	Scott Instruments VET-2	Sun Electronics VR-1500	Threshold Technology 500/580	Threshold Technology 600/680
COMMUNICATIONS INTERFACE	RS 232-C, RS-422, GPIB	RS-232-C	RS-232-C via host	Parallel	RS-232-C	RS-232-C
PROCESSING FACILITIES						
Type	NEC DP-200 CSR	NA	AppleII,II+host,TRS-80 host	Z-80	LSI-1	LSI-11
Main memory	64K D-RAM	ROM	32-48K RAM (host)	16K RAM; 4K ROM	64K RAM	64K RAM
Software	—	—	NA	NA	Firmware	Firmware
SPEECH CHARACTERISTICS						
Recognition technique(s)	Dynamic programming	Dynamic programming	Pattern generation, comparison with stored vocab.	Pattern generat., pattern matching, data compres.	Spectral analysis, pattern recognition	Spectral analysis, pattern recognition
Maximum number of speakers supported	1	1	1+	1	Unlimited	Unlimited
Maximum number of voice references stored	500 words	120 words	40	32	Unlimited	Unlimited
Handle continuous speech?	Yes	Yes	No	No	No	No
Percent recognition accuracy	99	99	98+	NA	99	99
Average response time	300 ms	300 ms	NA	400 ms	Less than 1 sec	Less than 1 sec.
Additional characteristics	Audio response	—	—	—	—	—
TYPICAL APPLICATIONS	Baggage sorting, data entry, inventory	Data entry	Data entry, inven., QC, mach. con., num. con. (NC) system	Data entry, sortation, games, handicapped	Speech recognition subsystem	Voice data entry terminal
PRICING, AVAILABILITY, AND SERVICE						
Purchase price	$20,000	$1,500	Contact vendor	Contact vendor (U.S.)	$8,700-$9,900	$10,500-$11,700
Monthly rental	NA	NA	Contact vendor	Contact vendor (U.S.)	—	—
Monthly maintenance	$400	NA	Contact vendor	Contact vendor (U.S.)	—	—
Quantity discounts	Yes	Yes	NA	NA	No	No
Product delivery ARO	4 months	2 months	NA	Contact vendor (U.S.)	Threshold	Threshold
Training provided by	NEC	Customer	NA.	NA	Threshold	Threshold
Service provided by	NEC	NA	NA	NA	Threshold	Threshold
Number installed	40		NA	NA	800 total units	800 total units

Datapro Research Corp. Chart

Fewer Firms Developing Voice Systems: IRD

The charts on Page 10 and below, from Datapro Research Corp.'s "All About Speech Technology" report, detail some of the speech recognition systems currently available.

By Tom Henkel
CW Staff

Only a handful of vendors currently offer voice recognition products of varying levels of sophistication. Many of these vendors are relatively small.

Unfortunately, either because of user resistance to the technology or because of the lack of demand for voice recognition systems, there are fewer firms developing or building voice systems today than there were two years ago, according to a recent report from International Resource Development, Inc. (IRD).

In its report, IRD noted that most vendors offer board-level products that are typically incorporated into a CRT terminal or are developed into a hand-held unit. A few voice recognition vendors — Interstate Electronics Corp., for example — offer chip-level recognition systems, according to the report.

IRD's report on "U.S. Speech Recognition and Synthesis Markets" is relatively optimistic about the entire voice recognition area. In fact, the study maintained that the industry is "poised for huge growth." It will begin to boom near the end of this decade, according to the report released by IRD.

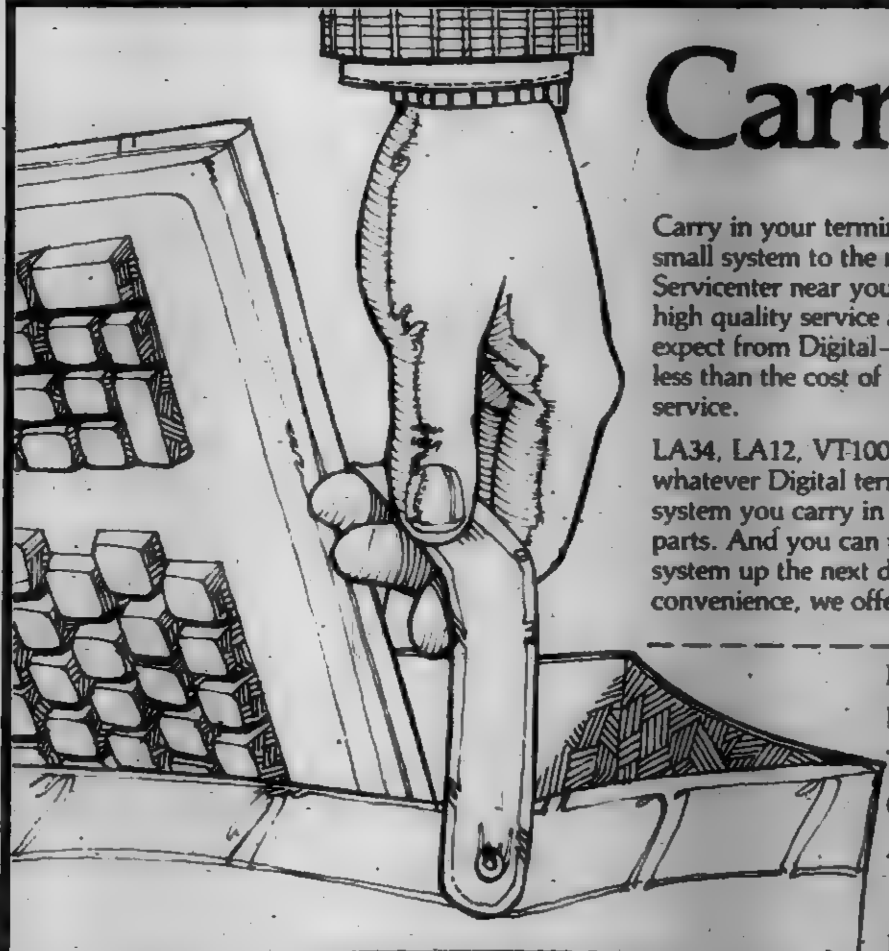
However, IRD tempered its enthusiasm by noting that the speech recognition business is currently at its lowest ebb, with nowhere to go but up.

The report also pointed out that "nobody is making any money" in the voice recognition business.

Product Spotlight

MANUFACTURER AND MODEL	Threshold Technology VNC-300	Verbex Model 1800	Voicetek Cognivox VIO-1000 Series	Votan V1000
COMMUNICATIONS INTERFACE	RS-232-C	RS-232-C, 20 mA, 3270	IEEE-488, I/O port of various micros	RS-232-C
PROCESSING FACILITIES				
Type	DG Nova 4/Eclipse	DEC PDP-11/04	NA	Digital signal processing
Main memory	64K RAM	256K RAM	NA	128K RAM
Software	Firmware	Proprietary	NA	NA
SPEECH CHARACTERISTICS				
Recognition technique(s)	Spectral analysis, pattern recognition	Vector processor, multiple reference templates	Pattern generation, pattern matching	Dyn prog pattern matching, digital filt
Maximum number of speakers supported	Unlimited	8 simultaneously	1	Unlimited
Maximum number of voice references stored	Unlimited	10+ (recog)	3	255
Handle continuous speech?	No	Yes	No	No
Percent recognition accuracy	99	99+	98	99+
Average response time	Less than 1 sec	NA	0 3 sec	0 3 sec
Additional characteristics	—	Optional voice response capability	Speech output—32 words or phrases available	Speech output available
TYPICAL APPLICATIONS	Single-user voice numerical control system	Data entry, banking, order proc., airline reserv	Data entry, games, data entry, educ , handicapped	Data entry/retrieval, control func , trans proc
PRICING, AVAILABILITY, AND SERVICE				
Purchase price	$42,650 to $68,765	$65,000 and up	$295	$3,200 to $4,200+
Monthly rental	—	Contact vendor	—	—
Monthly maintenance	—	Contact vendor	—	—
Quantity discounts	No	NA	Yes	Yes
Product delivery ARO	60-90 days	NA	2 days	30 days
Training provided by	Threshold	Verbex	Customer	Votan, OEM
Service provided by	Threshold	Verbex	Factory	Votan, OEM
Number installed	46	NA	Over 11,000	NA

Datapro Research Corp Chart



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Talking Computers Still in Realm of Sci-Fi

(Continued from Page 10)

sorting. Basically, any application that demands undivided use of a person's hands and eyes is ideal for voice recognition, Gruza said.

General Electric Co. has installed about six voice recognition systems over the past four years to perform quality-control functions in various manufacturing plants. Applications there range from testing printed-circuit boards to building major appliances, according to Jeff Erlich, manager of applied technology at GE's Bridgeport, Conn., Computer Management Group.

Unlike voice recognition critics and pundits, Erlich maintained that, despite lack of widespread acceptance, current voice technologies are fine. However, the stumbling block may be interfacing spoken input with standard data processing hardware. Instead of more research devoted to advancing speech recognition techniques, Erlich said he would prefer to see more packaged systems designed to mesh with traditional computer and other manufacturing hardware.

"In one case, I have a usable product; in the other case, I have nothing," he noted.

The keys to a successful voice recognition system, Erlich pointed out, are attention to detail and developing a system that is convenient for factory workers to use. That means incorporating commonly used jargon into the system so the worker talks to the recognition system in much the same way he talks to his associates, he explained.

Factory workers at GE reportedly like their computerized speech system because the workers "don't have to speak in an artificial way," Erlich said. The main reason for acceptance has been the use of systems that are tailored to the users, as opposed to simply replacing a terminal with a microphone, he claimed.

While voice systems are, for the most part, still in their infancy, the technology has made significant strides since Bell Labs' tube and transistor experiment about 30 years ago. For instance, while most voice recognition systems on the market today are user dependent (meaning the systems are geared to a single user's voice pattern) and require the user to pause between inputs, advancing memory technology has increased system vocabulary.

In addition, advances in peripheral technology, such as improved microphones and filters, have reduced some earlier problems of background noise, which previously forced users to repeat inputs or virtually shout commands into the machines.

Ramis Updated, 'Atlas' Unveiled

(Continued from Page 1)

linane Database Systems, Inc.'s IDMS, Software AG of North America's Adabas and Cincom Systems, Inc.'s Total.

Reporting extensions added to Ramis provide basic statistics facilities, flexible underlining, enhanced test display and selection of groups of records based on summary values, the vendor said. The extensions, which expand the range of report types available on Ramis II, are provided at no extra charge.

The enhanced release of Ramis also includes improved access to Vsam files via primary or alternate keys and improved processing of calculation statements, the vendor reported.

CICS Competitor

The Atlas data communications monitor unveiled last week by Mathematica was designed to take advantage of new DOS/VSE Release 2.0 capabilities. Applications written for Atlas can use any operating system facility without impacting other applications or the Atlas system, the vendor said.

Atlas is invoked through a standard call interface; no precompilation processing is required for applications. Mathematica said that while running at 10% capacity, the monitor can process an average of 6,000 transactions per hour submitted from 200 terminals.

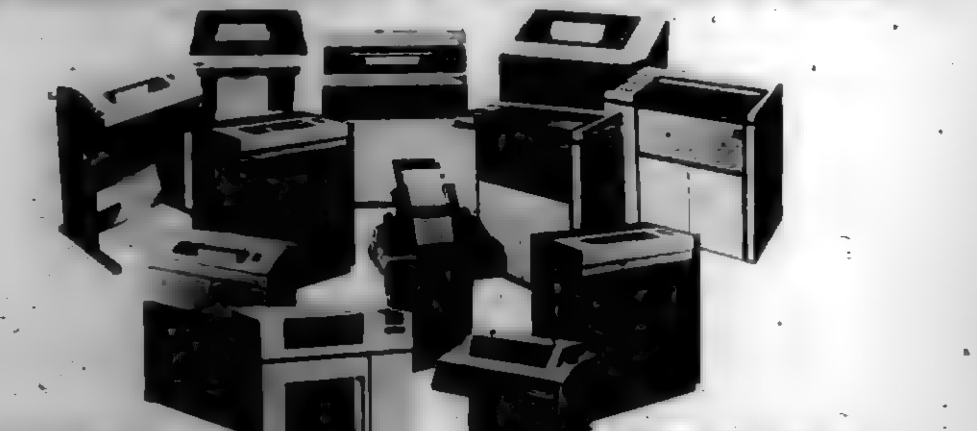
The package supports IBM 3270 terminal screens and teletypewriter devices and includes a dial-up capability for 3270s that requires no special hardware or operator intervention, Mathematica claimed. High-level mapping support is available.

Files can reside on a variety of direct-access storage devices and either monitor-serviced or direct program file I/O can be used. File I/O automatically precludes deadlock situations and prevents concurrent update problems, a spokesman noted.

Atlas is upward compatible from MPGSwift II, Mathematica's data communications monitor for smaller terminal networks operating under DOS, DOS/VS or DOS/VSE.

A typically configured Ramis II ranges in price from $48,000 to $130,000, depending on CPU power. Relate is priced at an additional $15,000 and the FSM costs $12,000. Atlas is available for $14,000 until April 1, after which the price doubles to $28,000.

Mathematica can be contacted at P.O. Box 2392, Princeton, N.J. 08540.



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Wants 'Thorough Public Examination'

House Asks Delay of Surveillance System

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — A House of Representatives subcommittee has asked the Secret Service and the Justice Department to delay development of a computerized surveillance system for tracking people considered threats to the president and other high-level officials until there is "a thorough public examination" of the proposal.

The House Judiciary Subcommittee on Civil and Constitutional Rights had planned hearings on the proposal for mid-December, but ran out of time at the end of the last congressional session. They will be rescheduled for early this year, a subcommittee aide said last week.

In an exchange of letters between the subcommittee and the two agencies involved, subcommittee chairman Don Edwards (D-Calif.) said the panel has "grave concern" about the privacy, civil liberties and First Amendment questions raised by the proposed system, which would use the Federal Bureau of Investigation's National Crime Information Center (NCIC) DP/telecommunications system.

In a strongly worded letter to Attorney General William French Smith, Edwards and Rep. F. James Sensenbrenner Jr. (R-Wis.), a ranking minority member on the subcommittee, detailed the questions the subcommittee wants answered to allay its "serious reservations" about the proposal.

Subcommittee Questions

Besides questioning the Justice Department's legal authority to implement the system on its FBI computers without specific legislation, Edwards and Sensenbrenner asked: "What are the criteria by which individuals are placed on the Secret Service list? Are these criteria subject to change? What restrictions are placed on dissemination of information once it is received by local police? What remedy, if any, does an individual have — and against whom? — if the information is improperly disseminated? How are individuals to be identified, [for example], name, date of birth, social security number [and so on]? What is the nature of the message that will be transmitted by NCIC to the local police?

"In addition," the letter said, "what assurance do we have that this system will not evolve into the sort of system maintained by the Secret Service in the 1970s when 'dangerousness' and 'threat' were interpreted to include poltical dissent? In 1972, the Secret Service had nearly 50,000 individuals on its lists, including such 'threats' as Jane Fonda, Tom Hayden, Ralph Abernathy, Cesar Chavez, Benjamin Spock and Walter Frauntroy."

The subcommittee members asked that no further steps be taken to implement the system until there is "a thorough public examination" of the proposal.

According to the Secret Service, however, it already has the legal authority to list its data with the NCIC. The agency added in a reply to Edwards that the system "will be very cautiously administered."

Use of NCIC To Track People Never Approved

Proposals to use the Federal Bureau of Investigation's National Crime Information Center (NCIC) DP/telecommunications system to check the whereabouts and activities of persons identified as possible threats to government officials under Secret Service protection have been considered for years. However, Congress has never authorized implementing such a system.

In addition, the Treasury Department — parent agency of the Secret Service — concluded 1½ years ago that the government would need a "massive" computer system to identify adequately and track the thousands of persons that might pose a danger to the president. Even then, Treasury said, the success of such a system would depend largely on "mere chance" [CW, Sept. 7, 1981].

Despite that conclusion, reached in a Secret Service management review following John W. Hinckley Jr.'s attempted assassination of President Reagan, Treasury asked the FBI to list those individuals already identified as possible threats by the Secret Service. Through the NCIC system, local law enforcement pesonnel would notify the FBI when they came in contact with anyone listed in the file and thereby help the Secret Service keep track of them.

When the House of Representatives Judiciary Subcommittee on Civil and Constitutional Rights learned of the Secret Service-FBI plan late last year, it insisted that Treasury delay its implementation until the subcommittee could review the proposal.

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BOCs Planning Two Networks

(Continued from Page 1)

formed by 19 of the to-be-divested Bell operating companies. The organization is performing common administrative, engineering and market development functions.

The local-area data transport service will be demonstrated "later this year in Florida," Polsen said. Other sources reported that the exact site will be Miami, where local-area data transport will support the large-scale videotex market trial that AT&T is sponsoring in conjunction with Knight-Ridder Newspapers. The system is expected to transmit data at speeds up to 8K bit/sec over existing local loops, using frequencies above the 4 KHz band employed for voice transmission.

The second service, Polsen said, will transmit 56K bits per second end-to-end using existing local loops and circuit switching. A technique known as time compression multiplexing will provide the data transmission capability, he added.

According to other sources, the local loop will still be usable, on an alternate basis, for telephone conversations. By operating a switch, the user will be able to change from one mode to the other.

At the four-day ICA seminar on "Local-Area Networks and Beyond," Polsen also discussed the underlying strategy that the Bell operating companies will pursue after divestiture. Their goal is to provide "a full range of transmission capabilities including voice, data, image and video transport."

The local-area data transport and circuit-switched networks will mark "the beginning of the transition from today toward the future Bell operating company integrated switched digital network," Polsen said. Specifically, both new networks will support a universal physical interface now being developed by U.S. and international standards-making bodies.

Ultimately, the new standard will enable the Bell operating companies to meet the need — which "many users have identified" — for "a single interface [that] can provide for a full range of applications and services without requiring separate physical or protocol arrangements or special engineering," Polsen said. "Services will be provided across the interface independent of the technology and configuration of both the telecommunications network and the user's equipment."

While this scheme should make it as easy to move and reconnect a data terminal as it is now to move and reconnect a telephone, there will be special benefits for certain users, Polsen indicated. He pointed out that one application for the Bell operating companies' new network offerings, as well as for their rapidly growing digital T1 channels, is to interconnect local-area networks.

"If standard interfaces are used, then neither the [local-area network] terminal nor the gateway are dependent on the technology [or] protocol" of the local-area network. Expansion of the network, maintenance and administration then become much easier, he explained.

AT&T Tariff Cuts International Rates

WASHINGTON, D.C. — AT&T filed a tariff this month with the Federal Communications Commission (FCC) that promises substantial rate cuts for international voice and data communications users and which is likely to become effective in April.

The tariff reduces the phone company's charges for its private international voice-grade circuits and for the first time permits them to be used alternately for data transmission. The circuits would handle speeds up to 9,600 bit/sec.

AT&T's basic rate for a leased voice-grade channel between the East Coast and the UK or Ireland is presently $5,066/mo. The new charge would be $3,400.

The basic rate covers the portion of the international circuit supplied by a U.S. carrier. Charges for the domestic U.S. access circuit and for facilities provided by a foreign carrier are additional.

The AT&T tariff would also reduce the price of alternate voice/data service, which is now available only from U.S. international record carriers (IRC). An alternate voice/data circuit between the East Coast and the UK, which currently carries a minimum basic monthly rate of $3,590, would be reduced by nearly $1,600/mo.

Circuit Conditioning Extra

However, alternate voice/data service from the IRCs includes circuit conditioning. AT&T plans to charge extra for this item.

AT&T's current monthly rate for a voice-only international private line to Europe is $5,066; to Africa, $5,066; to Central America, $4,466; South America, $5,347; and to the Pacific, $7,195. In its tariff, it proposes the following monthly rates for a voice-only or an alternate voice/data international private line: Europe, $3,600; Africa, $3,800; Central America, $3,200; South America, $3,800; and the Pacific, $4,300.

The IRCs' current monthly rate for an alternate voice/data international private line to the UK and Ireland is $3,590; to Europe, $3,710 to $4,120; to Africa, $4,120; Central America, $3,380; South America, $4,100; to the Pacific, $4,369 to $5,520.

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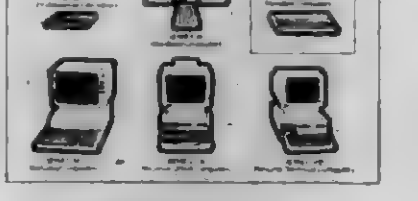

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HEWLETT PACKARD

In Wake of Bell Breakup

ICA Seminar Ponders Intracity Net Viability

By Phil Hirsch
CW Washington Bureau

ORLANDO, Fla. — Intracity communications networks received a lot of attention here last week at the International Communications Association's (ICA) seminar on "Local-Area Networking and Beyond" — and for two very good reasons.

First, observers of the telecommunications scene generally agree that the breakup of the Bell system will increase local-exchange rates. However, in attempts to reduce their noncommunications costs, many companies are installing additional on-line information systems, which makes the shortcomings of the telephone carriers' analog local loops more serious.

Secondly, the ICA is a users group whose members represent the nation's largest corporations — the most likely users of intracity communications networks.

The basic question addressed here last week was which of the many intracity communications networks' technologies is most viable. Much of the commentary on that question came from consultant Brad O'Brien. O'Brien's company, the Perspective Telecommunications Group of Paramus, N.J., will shortly publish an analysis of the emerging intracity communications network market.

Among O'Brien's major points were:

- CATV networks are very likely to become intracity communications networks, but they will be carriers rather than providers of end-to-end service. Reason: most of the new two-way cable networks are being installed in suburban areas rather than urban areas, where prospective intracity communications networks users are clustered. Moreover, CATV operators do not know enough about data communications; entertainment TV is "another country," O'Brien said.
- Digital termination systems (DTS) are also likely intracity communications networks, primarily because many of their suppliers are carriers with existing customer bases that could reduce their costs appreciably by replacing telephone company analog circuits with their own DTS microwave links.
- Private microwave is particularly attractive in downtown areas, where cable-laying costs tend to be high. However, bad weather seriously degrades the performance of these links.
- Private cable is attractive technically because it is not distance- or bandwidth-limited. The big drawback is the time needed to acquire right of way for the cable and the high cost of laying the cable. O'Brien believed that in at least some cities, owners of conduit, such as electric power companies, may form partnerships with intracity communications network carriers.
- The success of all these "bypass" technologies will depend largely on how the Bell operating companies respond. About 5% of the nation's local-loop plant is now being digitized annually. Meanwhile, the number of T1 local loops usable for digital voice as well as high-speed (1.5M bit/sec) data transmission is increasing.

On this latter point, O'Brien estimated that the Bell operating companies probably will lose no more than 3% of their customer base to competing intracity communications networks. But, he pointed out, this represents some $500 million in annual revenue, enough to make intracity communications networks viable.

Simon Disagrees

Art Simon, director of marketing for the Commercial Services Division of Warner Amex Cable Communications, Inc., disagreed strongly with O'Brien's comments about CATV. His company is almost ready to turn on a dedicated business cable network in Pittsburgh, Pa., that will serve the downtown area. Similar facilities are under construction in Dallas, Cincinnati and Milwaukee.

Simon also contended that his company and other CATV operators are eager and able to provide end-to-end data communications services.

Joe Tokarz, manager of applications engineering for General Electric Co., a major manufacturer of 18- and 23-GHz private microwaves, insisted that the only serious attenuation problem affecting these systems is heavy rain. In a city like Washington, D.C., which has a normal rate of rainfall, transmission at speeds of 3M bit/sec to stations five miles away is routine. He added that these links provide 100% reliability and bit error rates of 1:10 (-9).

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PBXs Seen Vital to Data Communications by '88

By Bruce Hoard
CW Staff

Even though private branch exchanges (PBX) are now used primarily for voice communications, they will become extremely important to data communications in general over the next five years.

However, digital PBXs are far from ready to replace their analog counterparts.

That was the predominant impression conveyed by 10 data communications managers contacted by *Computerworld* during an informal survey last week. Their comments came as American Bell, Inc., AT&T's unregulated subsidiary, was believed poised to unveil Antelope, the first digital PBX expected to come out of Bell Laboratories, Inc.

International Paper Co. in Mobile, Ala., has several PBXs, but is running limited data through them via a few slow-speed, dial-up terminals, according to Gerald H. Williams, supervisor of voice and data communications. The company has no plans to add data capabilities, Williams said, because "we haven't seen any big reason to do that yet."

Despite that fact, Williams said that PBXs will be "extremely important" to data communications over the next five years.

Cal Rader, director of communications for Western Airlines in Los Angeles, said that Western has put out a request for purchase for a new corporate telephone system to be built around a PBX. The company has narrowed its choices down to such major vendors as Rolm Corp., Northern Telecom, Inc., Datapoint Corp. and American Bell.

"I think anyone would be kind of crazy right now to turn out a [request for purchase] for something as sophisticated as a PBX without putting American Bell in the loop," he said.

Rader said that PBXs will be an integral part of data distribution in offices over the next five years, noting they will be used to connect terminal equipment to host processors.

Vincent A. DeGennaro, manager of telecommunications planning with American Can Co., Greenwich, Conn., said over the next five years, "PBXs will be the transmission medium throughout the office." Although American Can is currently running voice only over its AT&T Dimension, it will acquire the data add-on feature for it before the year is out.

DeGennaro noted that digital PBXs hold an advantage over analog models in their ability to save money by going "modemless" from port to port. Like most of the other respondents, he rated service and reliability as the most important factors to consider when getting a PBX.

One data communications manager who wished to remain anonymous said data transmissions on his firm's voice-only PBX "would be helpful" and added he would like both analog and digital capabilities in the same unit.

On the five-year future of PBXs, he said, "I would suspect they would become very important in that microcomputers will be attached to them."

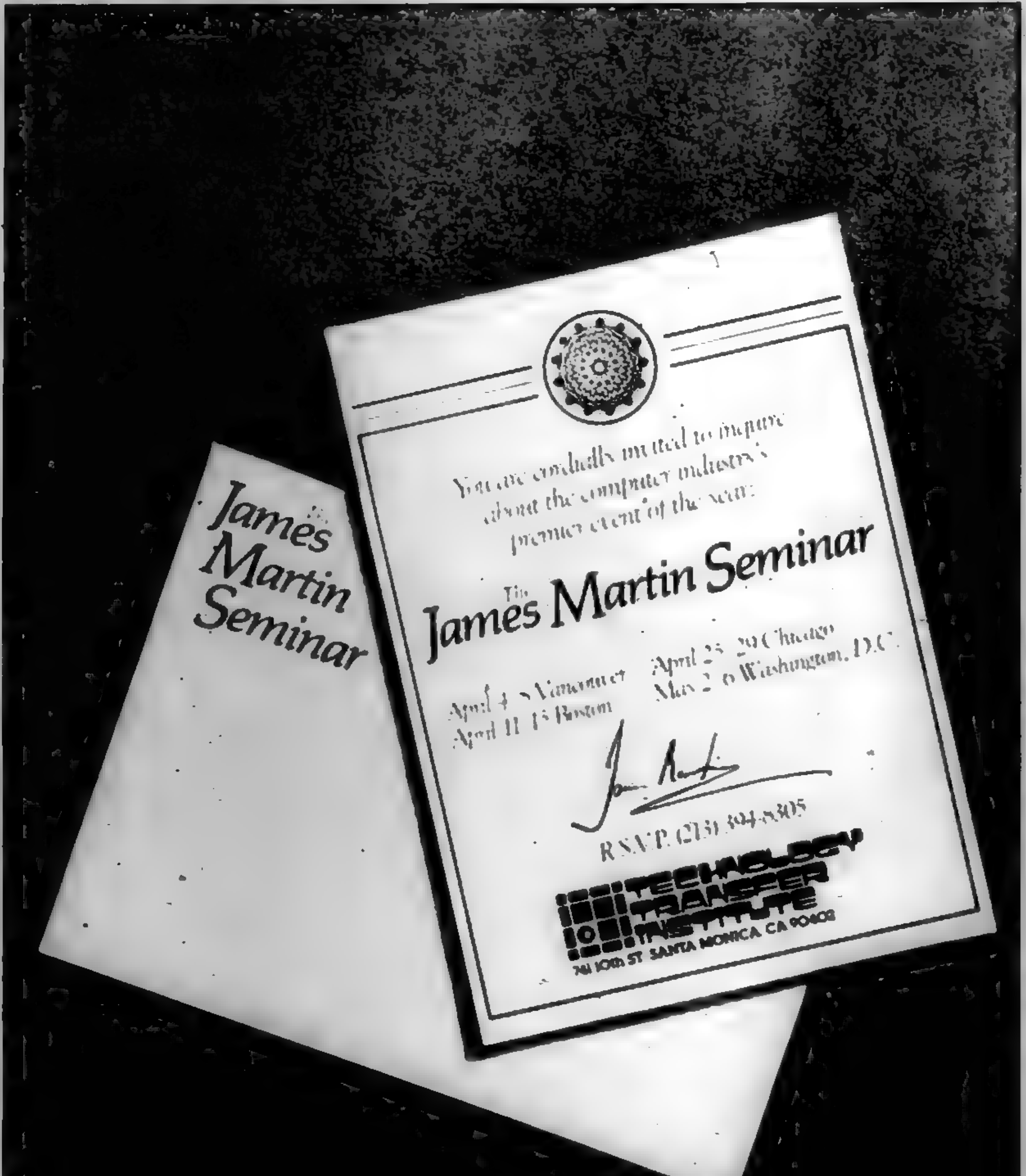
Digital PBXs remain a thing of the future for R.L. Walsh Sr., manager of telecommunications for General Cable Co. in Greenwich, Conn. "We serve three different locations so we still have to get out there in the analog world between buildings," he said.

General Cable intends to buy a Dimension and is considering the data add-on feature, he noted. Walsh said the transition to digital may be slower than is anticipated "except for the leading edgers."

Potomac Electrical Power in Washington, D.C., will have a PBX within a year, according to telecommunications manager Mario S. Valentini. He said that PBXs will become "extremely" important over the next five years.

Another anonymous respondent said his company was using its Dimension for voice-only communications and has no plans to add data capabilities. He said that over the next five years PBXs will be "an important part of the total mix."

He rated flexibility as the most important factor to consider before acquisition, saying, "I'd want to make sure I didn't get locked into some limited growth path."



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Ex-Fed Worker Pleads Guilty

WASHINGTON, D.C. — Former Federal Reserve Board employee Theode C. Langevin pleaded guilty last week to illegally tapping the Federal Reserve's computers after leaving the government to work for E.F. Hutton & Co. in New York.

Langevin had been charged in federal court here with one count of wire fraud in connection with gaining access to the Federal Reserve data bank on money supply projections in late November [CW, Jan. 10.]. The data is potentially valuable for brokerage houses trying to predict government interest rate actions.

Langevin, who will be sentenced next month, faces a possible five-year jail term and a $1,000 fine. However, government prosecutors indicated they will not seek a jail sentence for the former Federal Reserve employee.

With Corporate Info Explosion

MIS Managers Say DP Planning a New Game

By Robert Batt
CW West Coast Bureau

The likelihood that large corporations will witness an unprecedented display of computing power at all levels this year is sending management information systems (MIS) managers scurrying to come up with systems planning procedures for coordinating this information explosion.

Complicating their task is the fact that computer technology is no longer the domain of only the MIS department. Users working on powerful new microcomputers are becoming ever more sophisticated, leaving DP managers to struggle with the problem of how to allow computers to proliferate within their organizations without losing control of the technological direction of those organizations.

Further intensifying the problem is the lack of a management tradition to fall back on. "There are severe shortcomings in current planning methodologies," observed Marc Steuer, director of planning and field support for corporate information services at Syntex (USA), Inc., a pharmaceutical company in Palo Alto, Calif. "There is no one methodology that can take the plan from its strategic concept and translate it into systems development."

According to the senior vice-president for an international banking firm, systems planning has catapulted into the arena of high-risk policy management, with many organizations having to make vital decisions on future technological directions within the next few months. "We have to make some fundamental decisions on the basis of what is unknown, and that is very scary," he said. "There is no tradition of management or technological thinking to stand on. The problems of growth mean that successful corporations are hitting technological barriers they have never faced before, entailing big risks."

In the absence of an accepted method of systems planning, leading companies are functioning on a trial-and-error basis. Syntex, for example, is setting up a planning project in the area of telecommunications.

"We are trying to develop a planning approach that encompasses both short-term and long-term objectives," Steuer explained. "Telecommunications is going to be an important part of supporting a business. Two years from now we will be greatly concerned with telecommunications capabilities, high-level languages and processing capabilities, yet there is little in the marketplace to guide us in how we should implement such a strategic plan."

Steuer sees systems planning within Syntex consisting of planning in the areas of data base technology, telecommunications and resources. His approach is to let the Information Services Division concentrate on the technology, while leaving applications development largely up to the end users.

"Our current approach to prioritizing needs to be revised," he pointed out. "In the future, applications will be the purview of the users, and we almost won't care what they do. To get to that point, however, we will need a strong infrastructure of basic business systems, such as accounts payable and modeling sys-

(Continued on Page 18)

Manager Doubles As Consultant

PALO ALTO, Calif. — Marc Steuer's job description is an unusual one. As director of planning and field support for corporate information systems at Syntex (U.S.A.), Inc., he acts as both a manager and a consultant for the pharmaceuticals enterprise.

Steuer went to Syntex in August 1981 after a career that included a job as a computer designer for an aerospace company in Bethpage, N.Y., and others as a management consultant for the accounting firms of Touche Ross & Co. and then Booz-Allen & Hamilton, Inc. "I wanted a company where I could participate in all facets of bringing information technology into a company. It had to be large enough so I would not feel too constrained," said Steuer, who has a master's degree in electrical engineering and an MBA in accounting.

"At the same time, there would need to be a diversity of challenges and an environment where management was progressive enough to fully back the need for development in the information technology arena," he said.

Syntex needed someone who could provide both systems planning skills and direct consulting assistance throughout the company. With Steuer's arrival, the company divided the corporate information systems' function: One area focuses on developing methodologies for planning, while the other uses these

(Continued on Page 18)

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Managers Facing Planning Game

(Continued from Page 17)

tems."

Several other companies are making a concerted effort to involve users more in the development and application of technology. At Continental Airlines, for instance, the philosophy is that users must become far more involved in the systems definition and planning process than they have been.

"The growth of information centers is giving users a bigger vote in systems development, and it is time for us in information services to go out and collect the ballots," said Charles Connoy, recently appointed Continental's director of systems and planning. "Users must be involved in satisfying their own information demands."

Connoy warned that if systems planning managers do not find ways to bring users into the planning process, serious organizational discord could result. Users can go out and buy their own microcomputers, he noted, so a company can quickly lose control of the direction of its technology and of data within the company.

Systems planners, Connoy argued, should treat data processing as a business function, concentrating on such areas as interaction with user departments, costs and training programs. "The systems planning manager needs to answer some important questions. For example, does the hardware plan match the applications plan? Are the information center or office automation plans consistent with the overall business strategy?"

At Denny's, Inc., in La Mirada, Calif., systems planning has been in operation for three years. Each year the company devises a long-range systems plan in conjunction with a five-year business plan.

The aim is to develop a technology plan to meet the business' needs. Areas of systems planning include technological issues, sequence of applications, costs and manpower requirements.

Despite the well-established nature of this exercise, however, Richard Kislowski, MIS director at Denny's, feels his firm still has some way to go."We are not yet ready to make the transition to an information resource concept. Right now we are at an application planning stage, and we want to make the transition to the data planning stage."

What that will entail, said Kislowski, is an emphasis on identifying what data the company wants to make accessible to users, storing and capturing such data.

Job Combines Two Skills

(Continued from Page 17)

methodologies for integration into consulting services throughout the company's field operations.

"One of the problems with planning is that if it is not done in a real-life, practical context, then the things you are planning have no real application to the needs of the company. On the other hand, to neglect forward planning risks the danger of neglecting the strategic needs of the company, so it's a question of balance," Steuer pointed out. He sees his job as determining which way the balance should be tipped at any particular time.

According to Steuer, for much of its history Syntex was managed as a group of individual enterprises with separate divisions having a good deal of autonomy. Under a recent reorganization, however, management of the operating units has been brought under the company president, Richard Rogers.

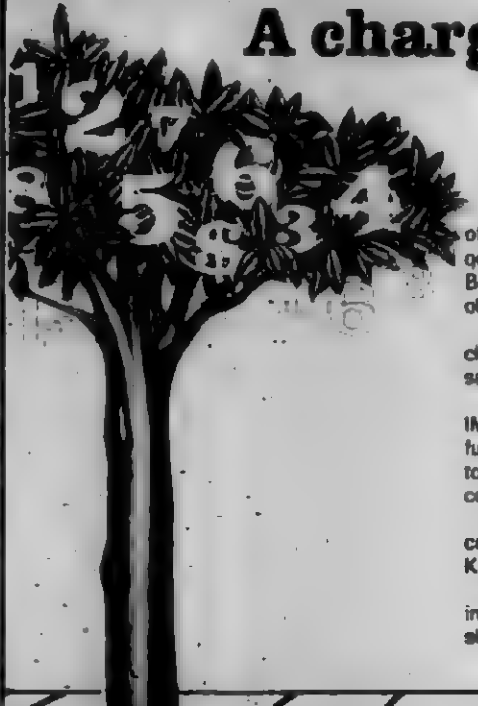
The job of the planning and field support management is to make sure that the right problems are being worked on in the information services area, so that DP activities are in concert with the company's business strategy. "The real questions tend to be whether we need a new accounts payable system or whether the real need is for a process control and cost system for our manufacturing plants. Without strategic planning, focusing and prioritization, you may never know if your DP guys are working on the right things,"Steuer said.

Syntex is now embarking on a series of projects to increase the scope and effectiveness of systems planning. Under Steuer's guidance, the company is setting up a projects team comprised of specialists in the area of office automation, industrial engineering and human resources to look at the behavioral aspects of productivity as they pertain to planning.

"To date, nobody has come up with a methodology to quantifiably figure out how to apply information technology in the managerial/professional domain," Steuer said. "We will start up projects and take a holistic approach to not just synthesizing processes in a department or improving managerial ability and team work, but also to making careful measurements before and after a project to get a chronology of what worked and didn't work as part of a total approach to this whole area of planning."

Steuer said this kind of practical research is necessary because the behavioral impact of the work carried out by the management information systems function is too frequently ignored. "When I look at a typical systems analyst or industrial engineer, I begin to question whether he really needs to be doing what he is doing," Steuer said.

"By taking this holistic approach, I believe we can substantially increase productivity and get satisfied users at the same time."



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SSA Data Center Move Wins 'Golden Fleece'

WASHINGTON, D.C. — Did redundancy and mismanagement in planning the move of the U.S. Social Security Administration's (SSA) data center, cost taxpayers unnecessary millions?

Sen. William Proxmire (D-Wis.) thinks so. The Wisconsin Democrat has tapped the SSA's planning effort as the recipient of his monthly "Golden Fleece" award, periodically handed to what Proxmire considers the federal government's biggest spending boondoggle.

Unfortunately, Proxmire's charges are destined to go unanswered. SSA spokesmen have refused to comment on the allegations.

Proxmire's version of the story goes like this: The SSA in 1979 assembled a top-ranking management team of government employees to plan the data center move, which was carried out last year. This team, Proxmire claimed, consisted of 13 management-level employees with various backgrounds, each earning $30,000 to $57,500 per year, with an average salary of about $41,000.

This team, the senator's office said, was "supposed to plan and prepare the move on its own . . . without outside help." In 1980, however, top management at SSA began looking for private consultants to assist in the planning effort. This request was subject to the nonbinding review of the SSA's Office of Human Resources, which, Proxmire's office claimed, recommended against seeking outside consultants "because it felt government employees could do the job themselves."

The Human Resources recommendation notwithstanding, the SSA went ahead and spent $6.7 million on two consultants to plan and prepare the move, Proxmire said.

"This was overt duplication . . . and a needless waste of taxpayer dollars," a spokesman for the senator said, adding that either the $6.7 million consultant fee or the approximately $1.5 million spent on salaries for the SSA planning team was unnecessary.

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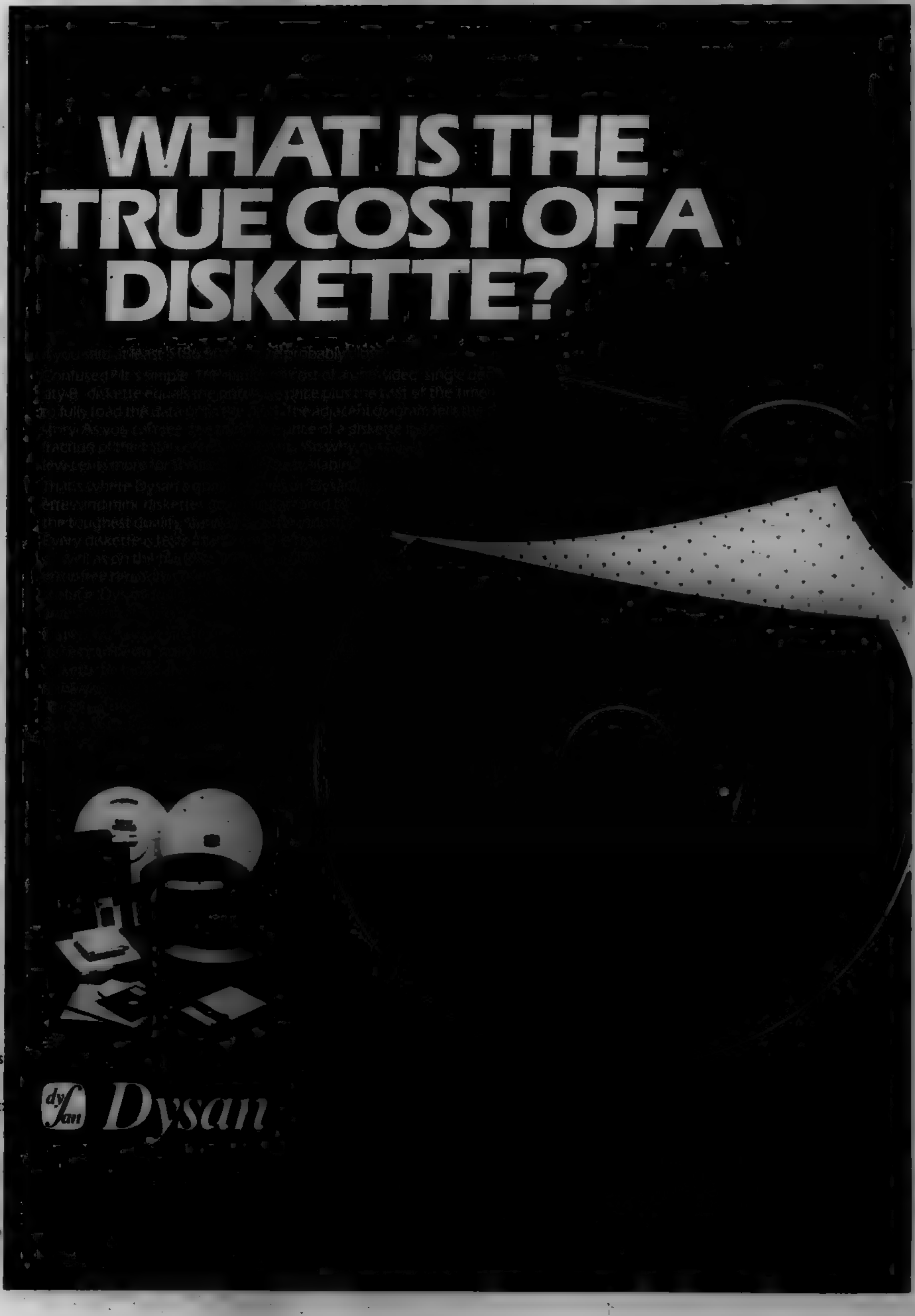

Feb. 8-9 in New York

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BOSTON — The Yankee Group will present a conference on IBM new segmentation strategies, entitled "Fortress IBM," in New York Feb. 8-9 and San Francisco Feb. 15-16.

The conference will cover the following topics: "IBM Mainframes and Data Base Directions," "IBM Office Systems Strategies," "SNA: A Moving Target" and "Living in a Mixed Vendor Environment: A Gateway Approach."

Other topics include "IBM Satellite Processor/Supermini Counterattack," "Implementing MVS/XA: A View From the Trenches" and "New Markets: Communications Products and Communications Services," a spokesman said.

The registration fee for the conference is $795 for the first person from each company and $695 for each additional attendee from the same company, according to a spokesman.

The Yankee Group is located at 89 Broad St., Boston, Mass. 02110.

OA Seminar Set for March 8

ANN ARBOR, Mich. — The Facility Management Institute will sponsor a seminar on "Office Automation: The Facility Management Perspective" March 8-10 here.

The seminar will provide managers responsible for facility decision making and management with information to develop and implement standards to support technology in office environments. It will look at existing office automation standards and explore how better standards can be developed, according to a spokesman for the institute.

The seminar, which costs $500, will be held at the institute, 3971 S. Research Park Drive, Ann Arbor, Mich. 48104.

One-Day Course To Cover Micros

DENVILLE, N.J. — Haverly Systems, Inc. is offering a one-day course for training executives in the purchase and use of microcomputers.

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The course, delivered at the user site, costs $235 per person. Haverly is based at 78 Broadway, P.O. Box 919, Denville, N.J. 07834.

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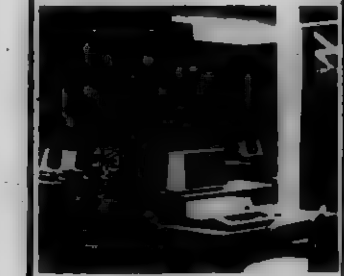

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Mass. Finds Way to End Pensions for the Dead

By Bill Laberis
CW Staff

BOSTON — The dead are not allowed to rest in peace in the Computer Age, especially if they are collecting pensions.

The Boston-State Retirement System has inked a contract with a local company to purchase a continuously updated, computerized data base listing the Social Security numbers of deceased persons. The purpose of the contract, according to a retirement board spokesman, is to prevent the mailing of pension checks to deceased pensioners, whose family members might be able to cash the checks illicitly.

The need to tighten up check-dispensing procedures became apparent last summer when it was discovered that the board had been sending checks to a pensioner who had died five years before. The pensioner's family had been forging the checks and then pocketing the pension payments, according to Brian Leahy, executive secretary to the retirement board. A preliminary investigation turned up several other cases of apparent misuse of pension funds by the families of deceased pensioners.

Leahy's office then sent out notices to its 14,500 pension recipients, ordering them to submit a signed and notarized copy of a letter as proof of their being alive. The recipients were warned that failure to return the letters by a specific time would cause the board to stop sending out the monthly pension checks.

As a result of the mailing, the board stopped payment on 156 pensions, representing a savings to the board of over $700,000 of the $85 million it pays out per year.

'No Way of Checking'

"But what we found was that we had no way of checking for validity of pension claims, whether anyone was actually alive or dead," Leahy said. "The notarized signatures gave us proof of who was alive at that time, but we needed some way of updating our files. We obviously couldn't rely exclusively on the honesty of others."

Because Boston had come under fire early last year after allegations that it had granted and dispensed sizable disability pensions to politically connected individuals, the retirement board wasted little time in trying to correct its problems with pensions.

Hooper Holmes, Inc., a service bureau headquartered in Basking Ridge, N.J., contacted the retirement board when news of the deceased pensioner problem was made public. Under the contract it signed last week with the retirement board, Hooper Holmes will periodically compare the data base of Boston's retirees with its continuously updated data base of deceased persons, within which is contained approximately 12 million names.

Identification Check

Hooper Holmes will then send a report via magnetic tape back to the retirement board, which will program its system to spit out any identifications appearing in both the retirement board's and Hooper Holmes' data bases. According to Anthony LaRocca of Hooper Holmes, utilization of the data base, which lists the identifications of Americans who have died since the '60s, is 98% effective in catching pension fraud.

"Catching just one or two people would pay for the whole system," Leahy commented, because the cost of the computerized data base service to the retirement board is "about $75 per 1,000 names per month."

The Boston antifraud measure is similar to steps taken by the U.S. Social Security Administration in Operation Spectre, which is using two computerized data bases to track down an estimated $40 million in SSA overpayments to the survivors of federal aid recipients" [CW, March 8]. Over 6,000 names to date have been deleted from the list of Social Security Administration recipients since Spectre began, according to government officials.

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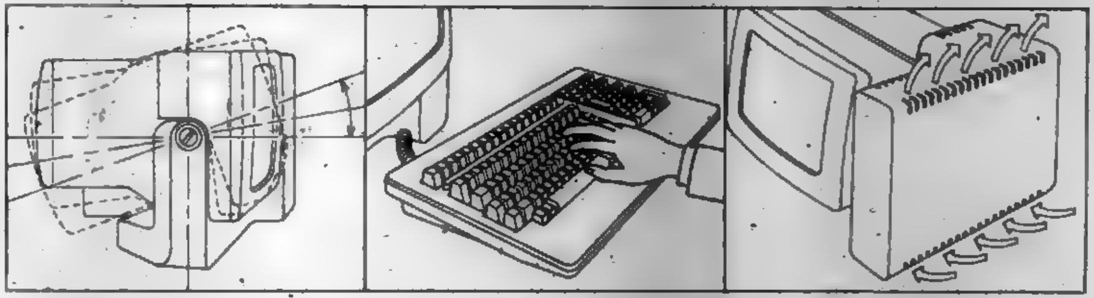

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GSA to Help FAA Speed Up System Purchase

WASHINGTON, D.C. — The Federal Aviation Administration (FAA) and the General Services Administration (GSA) have signed an interagency agreement to help speed the FAA's procurement of new air traffic control (ATC) computers.

Under the agreement, GSA has assigned Agency Liaison Officer John Hargett on a full-time basis to assist the FAA with the acquisition of host computers to replace the present third-generation IBM 9020s in the FAA's 20 air route traffic control centers. The new computers will host the existing 9020 software and will be fully compatible with the present radar display equipment, according to an FAA spokesman.

Hargett will advise the director of the FAA's Advanced Automation Program Office, Valerio R. Hunt, on technical, policy and regulatory matters related to the computer replacement program. Hargett will also coordinate and facilitate GSA activities in support of the program.

The FAA issued a request for proposals Dec. 30 for the initial computer system design competition phase, with a Feb. 17 deadline for proposals. Sperry Univac and IBM are expected to bid.

The competition systems will be tested and evaluated at the FAA Technical Center in Atlantic City, N.J., and one manufacturing team will be selected to proceed with production. The first delivery is scheduled for 1985 with all slated to be on site by the end of 1987.

Concurrent with the rehosting effort, the FAA will also proceed with the development of new controller workstations known as "sector suites," which will have their own microprocessors, and the software for the workstations.

A separate competition for that system is planned. Delivery of that equipment is scheduled to begin in the late 1980s.

While the FAA currently operates 20 air route traffic control centers in the contiguous 48 states, the agency plans to reduce that number to 16 by 1990.

Western Electric to Evaluate Replacement Plans

WASHINGTON, D.C. — Western Electric Co. has received a contract to evaluate Federal Aviation Administration (FAA) plans to replace the IBM 360-architecture mainframes in the agency's air traffic control system.

Replacing the IBM 9020 mainframes — now in operation at 25 air traffic control centers and at several FAA support facilities — with compatible machines is the first phase of the "national airspace system plan," the $9 billion FAA automation project announced last year [CW, Feb. 8].

The Department of Transportation said the Western Electric contract is for "an independent, outside analysis based on analogous Bell system experience to review the rehost objectives, assess the FAA's estimates of software changes required for rehost" and to offer recommendations fot successful rehosting.

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HP 1000 Users To Meet April 26

LOS ALTOS, Calif. — The theme of the 1983 International Conference of Hewlett-Packard Co. HP 1000 Users to be held here April 26-28 is "Exploitation '83 — Getting the Most from Your Computer."

The UK RTE Users Group will host the conference under the sponsorship of the HP 1000 International Users Group, Inc. Attendees at the conference will deliver papers on topics such as data base management, microprogramming, graphics and data communications.

In addition, HP personnel will present seminars on the use of the HP 1000.

The cost for the conference is approximately $325. More information is available from the HP 1000 International Users Group, Suite 205, 289 S. San Antonio Road, Los Altos, Calif. 94022.

Service Association Selects Chairmen

SANFORD, Fla. — The North American Computer Service Association has selected committee chairmen for the group's Advisory Committee.

Chosen to serve on an interim basis were the following: nominating chairman, George F. Anderson, chairman of Systec, Inc.; publication chairman, Ellis Murphy, vice-president of Lurie-Murphy; and education chairman, Martin Schatz, dean of Rollins College.

Others chosen include the following: certification and training chairman, Brent Knight, president of Triton College; and finance chairman, David G. Glascock, managing director of Consultants Group.

The association is located at 110 W. Airport Blvd., Sanford, Fla. 32771.

Reorganized Air Traffic Controllers Still Vocal

By Marguerite Zientara
CW Staff

WASHINGTON, D.C. — Fired air traffic controllers do not just fade away when their union is decertified. They reorganize as a nonprofit corporation.

And just as the controllers have not faded away, neither have their complaints about the alleged problems that sent them out on an illegal strike more than a year ago [CW, Aug. 10, 1981].

The complaints among working controllers concerning pay, benefits, hours and an antiquated computer system remain, according to Mike Fermon, national treasurer of the U.S. Air Traffic Controllers Organization (Usatco), successor to the Professional Air Traffic Controllers Organization (Patco).

Usatco views the current state of air traffic control as a "problem that could be solved virtually overnight [by rehiring the 11,400 fired Patco controllers] ... especially at this point in our economic history," Fermon said. Incorporated last July, Usatco members "don't understand the [government's] point of not allowing those qualified to go back to the air traffic control system," according to Fermon, who cited the "money wasted in rebuilding the system, the reduced capacity and restrictions."

Fermon is one of a handful of former Patco officials who now administer Usatco, which claims about 1,600 dismissed controllers as members. Only "a couple dozen" of the members are working controllers who never went out on strike, Fermon said.

Since the strike, the Federal Aviation Administration (FAA) has "hired many new controllers and we're obviously not going to change our minds and rehire those who struck illegally," according to FAA spokesman John Leyden. "It's a dead issue and I think [the fired controllers] realize it's a dead issue."

Does Usatco feel the FAA's plans to replace air traffic control (ATC) computers — slated for installation between 1985 and 1987 — will improve the reliability of the ATC system? "Naturally, we're in favor of equipment improvements if they will accommodate the FAA's claims in terms of safety," Fermon said. "But if its greater reliance on machines results in a reduced number of people, they may sacrifice safety.

"There are a lot of things people can do that computers can't do," he added.

Fermon also charged that there will be a "deterioration of safety" as long as the FAA continues to operate at its poststrike reduced staffing level. "We are concerned that as time goes by, there will be fewer experienced controllers working as they leave to retire or because of dissatisfaction with working conditions," Fermon explained.

"Sure, there are not as many experienced controllers, but we're compensating for it by using different procedures," the FAA's Leyden countered. Citing extended flight separation distances and automated flow control methods, he said that the statistics for near-misses and operational errors are "better than before the strike."

A recent National Transportation Safety Board draft report, however, pointed out controller on-the-job training-related safety problems "require immediate, corrective action by the FAA" (see story below).

The Professional Airways Systems Specialists (Pass) corroborated a claim by Usatco that routine maintenance checks on ATC computer systems are often neglected. "We have heard complaints about that from people in the field," explained Pass Executive Vice-President Mark Schneider.

Acknowledging that Pass has no statistics on maintenance as compared with the pre-strike period, Schneider contended, "[Maintenance] is not as easy to do as it used to be. The problem now is that some controllers are reluctant to release their equipment for routine checks while they're on duty and we can't do the checks without their permission."

NTSB Calls Controller Shortage 'Stressful'

WASHINGTON, D.C. — Shortly after the firing of the 11,400 Professional Air Traffic Controllers Organization strikers in 1981, the National Transportation Safety Board (NTSB) issued a report warning that the reduced work force could cause controller stress and threaten safety [CW, Nov. 2, 1981].

Now, more than a year later, a recent NTSB draft report sent to Federal Aviation Administration (FAA) administrator J. Lynn Helms cites the "very stressful" situation regarding computer-based, on-the-job training of newly certified controllers.

The draft is a prelude to the NTSB's formal, overall report on "how the [air traffic control] system is being run," an NTSB spokesman said. That report is slated for release in March.

Before May 7, 1982, according to the NTSB, a controller assigned to conduct on-the-job training for a trainee controller was required first to receive FAA-approved instructor training. On May 7, 1982, however, the FAA waived that requirement for facilities "where resources prohibit administering appropriate training courses" until May 1, 1983, the draft

(Continued on Page 24)

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Systems Developer Credits Sales to Portable Terminals

WAYNE, Pa. — Portable terminals may not be the only reason why Bookkeeper Corp., a computer system developer, realized first-year revenues of over $500,000.

But they certainly helped, according to Bernard Klawans, the firm's founder and president.

The computer system developer firm used the terminals — made by Computer Devices, Inc. — to demonstrate its customized software programs onsite and establish a diverse client base of financial, medical, manufacturing and educational organizations.

The key to the company's success is reportedly its ability to create specialized data base management programs 20 to 100 times faster using its Datamate II proprietary software language than using conventional Fortran.

Consequently, Bookkeeper can provide its customers with customized software packages at lower cost.

According to Klawans, a portable terminal is the best way for the firm's prospects to become aware of what its product could do.

Klawans' prior experience with Computer Devices terminals, while he managed a General Electric Co. data center, led him to choose the same equipment for his own company's use.

"The 15 Computer Devices terminals at GE were very reliable, and they held up under very rough treatment," he explained.

His experience with the terminals at Bookkeeper has been equally rewarding. "The only problem we've had in more than a year has been a missing washer which was replaced," he stated.

Moreover, the portable terminals are versatile, allowing Bookkeeper's analysts and staff to perform programming and general off-site maintenance at home.

The terminals feature bidirectional, whisper-quiet printing; multiple-column formatting; and high-resolution, dot-addressable graphics.

The terminals also feature a variety of communications options which include: store and forward, autodial, auto answerback, Bell 212 telephone modem and TWX and CRT terminal interfaces.

For greater versatility, the terminals can be equipped with CCITT-compatible modems in place of the standard Bell 103 or the Vadic Corp. 2400-type modems. The RJ11 connector facilitates direct connection to a telephone line.

Even more important, however, has been the tremendous impression the equipment has made on potential customers. One demonstration won Bookkeeper a popular local money market fund account. Another system demonstration resulted in a Pennsylvania school township contract for a complete turnkey operation to process school records, student attendance information, food service budgets, payroll, taxes, inventory, and accounts receivable and payable.

In fact, Bookkeeper has used the terminals to successfully bid for accounts with an Ivy League university, a brokerage firm, a specialized pharmaceutical wholesaler, a travel agency, several banks and a New Jersey school district.

The portable terminal is so popular with the company's prospective customers that it functions as a loaner as often as it does a demo unit.

"We don't hesitate to recommend the terminals to our customers who need such a tool," said Klawans.

NTSB: Shortage 'Stressful'

(Continued from Page 23)

noted.

NTSB's investigation found that "many facilities are using newly certified controllers to provide [on-the-job training] on both radar and nonradar control positions . . . before they have had time to develop either sufficient experience or 'seasoning' at that position or receive FAA-approved instructor training."

Furthermore, the report said, "In some instances, developmental controllers were certified on a position in the morning and were conducting [on-the-job training] at that same control position for another developmental controller in the afternoon of the same day."

Because the FAA Handbook requires on-the-job-training instructors to be "proficient" — defined as "highly skilled" — NTSB has recommended that the FAA "immediately cancel the waiver" and "reexamine its use of newly certified developmental controllers as [on-the-job-training] instructors."

In addition, the promise of extra pay for on-the-job-training instruction, the desire of senior controllers for a "return to a normal work week and vacation schedule" and management's desires to meet training goals have resulted in "extensive training periods," according to NTSB.

"As a result, many senior controllers are conducting [on-the-job-training] for 5 to 7 hours per shift, which the Safety Board has determined to be very stressful for the instructors and trainees in heavy work load situations," the draft indicated.

"Additionally, the extended hours of [on-the-job training] do not provide for a meaningful learning situation for the trainees," said the NTSB report.

The Board contended, "It is the responsibility of managers to recognize the adverse consequences of conducting protracted [on-the-job training] and to develop realistic methods of keeping the amount of [on-the-job training] required to be provided by controllers at an acceptable level."

In its investigation, the NTSB surveyed 50 air traffic control facilities, including 16 air route traffic control centers and 34 terminal radar and nonradar facilities, and interviewed about 350 facility managers, staff controllers, controller trainees and military controllers temporarily assigned to the FAA.

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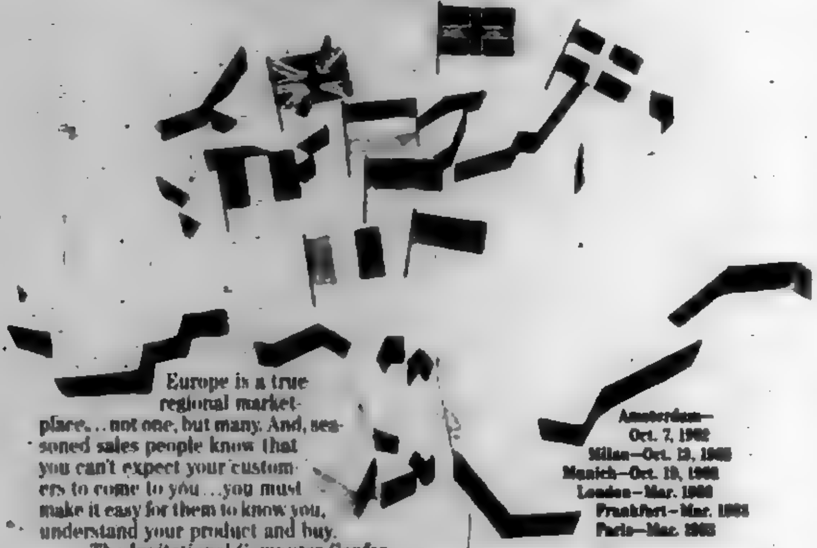

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How to Get Corporate Backing?

Turnaround Time

By Larry E. Long

Q **In the recent In-Depth series you authored on management information systems (MIS), "Long-Range MIS Planning" [CW, Aug. 2], you wrote in the first paragraph of the last part of the series, "MIS planning . . . requires a commitment of support and cooperation from all corners and levels of corporate endeavor." How do you set the wheels of change in motion *without* corporate backing?**

A great deal goes on in a corporate structure that defies analysis from the outside. It is all very well to say that the correct procedures are thus and so, but the real problem is how to implement the MIS function correctly when nobody really wants it that way — when departments ask your advice on word processing but don't take it; when upper management returns from peer-group meetings and tells us that we have more than they (which may be true, but isn't saying much).

As far as I can gather, the real problem is fear of change. Those of us who have been in the computer business for a number of years have become accustomed to change. When *we* see something better, we drop everything and hop to it. Not so with those classified as "users." When *they* see something better, it scares them. If we force a change on them, it is a threat to their job security and to their intelligence. "They" are everybody from the data-entry clerks to the president of the organization.

It would be much nicer to do things as you describe, but in a small organization like ours with political factors, it won't wash. In fact, I tried to inject a commitment to "plan" (that's all, just plan) for an upgrade of administrative computing facilities into the organization's "Long-Range Plan," and the response to "All in favor?" was deafening silence — just as I expected.

A In my MIS long-range planning methodology, I never promised you a rose garden. In my methodology, MIS long-range planning is the ultimate political, procedural and operational challenge. Even so, it can be done.

Q **You, I and many others know that a good computer programmer may not make a good systems analyst, and vice versa, because these fields require different aptitudes. However, many do not appreciate this fact and this leads to job mismatching. For instance, the federal government has both fields in the same "Computer Specialist" classification series.**

Do you know of any empirical studies that point to the difference in aptitudes required for these two disciplines.

A If you, I and just about everybody else know that skills required for programmers are markedly different from those required for system analysts, why does the federal government not differentiate between the two, and why do the majority of data processing departments have career development programs that encourage programmers to become analysts?

To my knowledge, no empirical studies have been conducted on this topic. A study is not needed to prove the obvious. What *is* needed is a reassessment and extention of the programmer career path. It is a crime to force some good programmers to become bad analysts.

Q **I recently retired from the military. To prepare for that time, I earned two B.S. degrees in business and data processing and an M.A. in management. I have accepted a systems analyst trainee position with a progressive oil company.**

I want to continue my education. My first thought was a master's degree in computer science, but now, however, I am not too sure. My personal preference is in the management field.

What type of schooling would you suggest?

A You have two bachelor's and a master's. Another master's degree will be of marginal value. Your best bet is to pursue continuing education in specific job-related skills.

Ask your supervisor what skills will be required during the training period. Direct your educational efforts toward acquiring these skills. This will accelerate your experience and, therefore, your progress toward management.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*

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Transit System Goes On-Line, Now on Time

SAN FRANCISCO — The San Francisco Bay Area Rapid Transit (Bart) system is the most computerized transit property in the U.S., as well as one of the most financially stable.

"We think computers played a major part in this success," said Thomas R. Sheehan, head of information systems for Bart. Bart "is capital intensive, and virtually everything we do here has DP implications," Sheehan added.

"This orientation leads to extensive use of computers in nearly all Bart activities," he noted. And computers have contributed to a steady improvement in system reliability as well as in performance.

On-Time Record Climbs

In 1981, Bart's "on-time" record climbed to 94.2% and volumes increased to more than 50 million patrons. By the end of the year, Bart had carried 300 million people, for a total of more than 3.9 billion passenger-miles since service began operation in 1972, according to Sheehan.

Furthermore, Bart currently costs 15½ cents per passenger-mile, less than half the operating cost for typical automobile travel in the San Francisco area. Bart pays almost half of its costs from the fare box, a percentage that continues to increase. Moreover, Sheehan continued, Bart has held the line on labor costs.

Computerized Wayside and Central Control operate the trains right down to every door opening and closing via sensors in the tracks, Sheehan explained. Computers also schedule the trains, oversee the automated ticket machines and monitor the turnstiles. They also help perform the more traditional back-office bookkeeping functions.

There is a small computer in each of the 34 stations to drive electronic information signs. Wayside and Central Control backup systems assure a level of operating safety never before achieved, while holding manpower needs to a minimum.

Bart has more than 150 small computers doing specialized functions. An IBM 4341 processor with 4M bytes of memory, however, is Bart's largest and most heavily used system.

Installed in 1981 to replace aging Sperry Univac 7046 and Honeywell, Inc. 6020 machines, it manages a long list of applications, including a financial management system, specific segments for funds commitment, accounts payable and labor management and scheduling.

Other applications are traffic flow and revenue information by station, materials management, labor distribution and a maintenance and reliability information system — the largest single application. The Materials Management System runs under Communications Oriented Production Information Control System, an IBM application program.

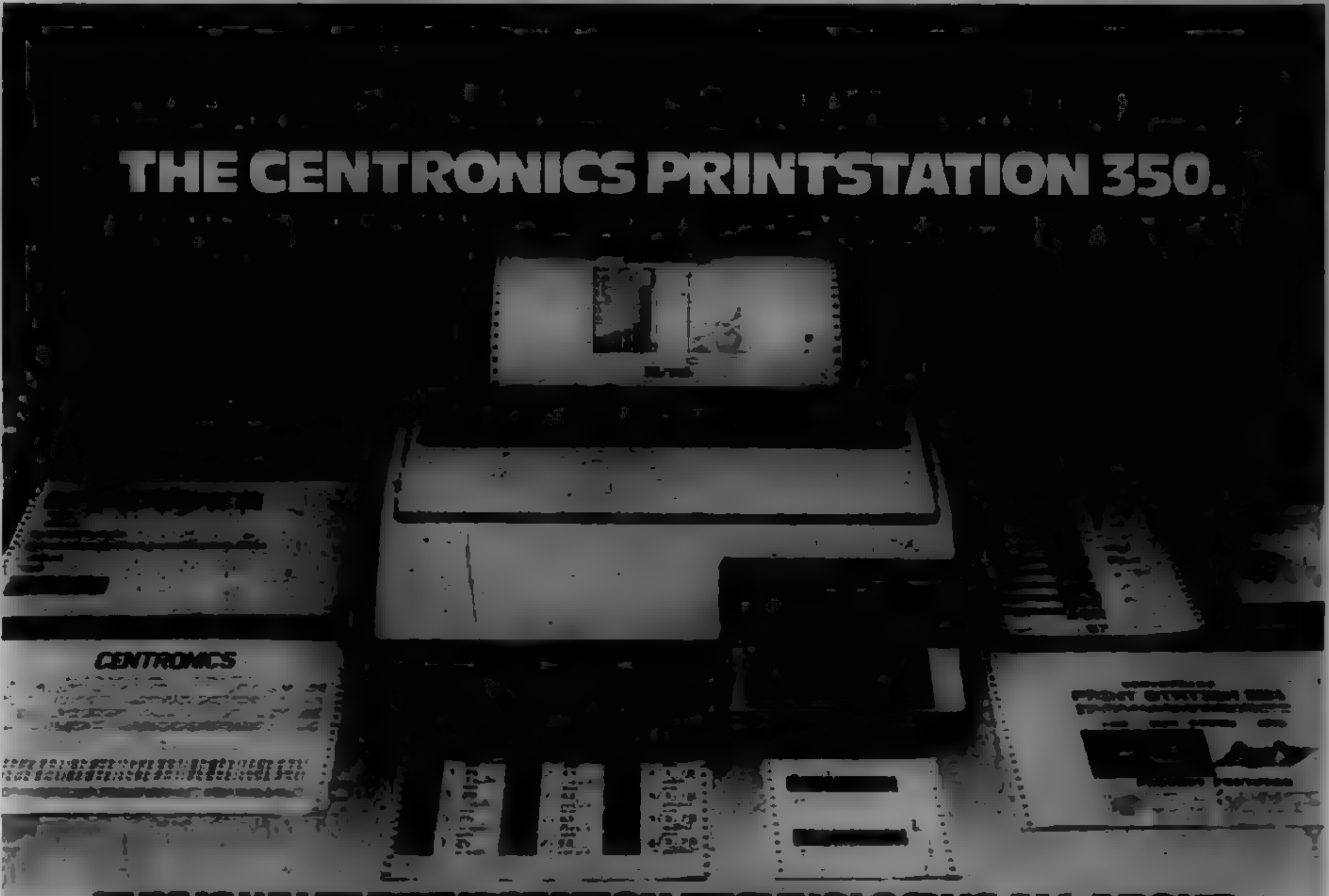
System Monitoring

Since the 4341 receives information passed along by the smaller processor that controls the train schedules, Bart has come up with a real-time system-monitoring program. Using IBM 3279 color video terminals and the Graphical Data Display Manager, the Train Information System displays the current location and status of every train in two formats.

A table-oriented format enables a Bart employee to announce arrival and departure information at every station. The other format is a "moving train scenario" that lets the viewer see the actual location of each train, shown as an arrow, superimposed on a route map programmed onto the screen.

The arrows are color coded to indicate a particular origin/destination combination. The locations are updated every 16 seconds.

"This is absolutely a first," said Sheehan. "It gives us both a statistical and a graphic representation of the entire route. Someday we may be able to install these moving scenarios at every station so the passenger will know when to expect the next train."



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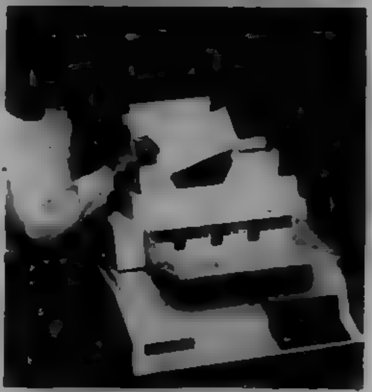

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Managers on the Move

Fred W. Stuart

FRED W. STUART has been appointed director of corporate information services for Phelps Dodge Corp. in Phoenix. He will assume responsibility for the company's eastern and western regional data centers and the direction of data processing, communications, word processing and related activities throughout the corporation.

Stuart joined Western Nuclear, Inc., a wholly owned subsidiary of Phelps Dodge, as director of data processing. In April 1981, he was named director of information resource management-West.

He received a bachelor's degree in finance from the University of Cologne in West Germany.

•••

JAMES E. STANIFORTH has been named vice-president of information services and JAMES S. SARNOVSKY has been appointed director of information services/sales for the Fruehauf Division of Fruehauf Corp. in Detroit, a supplier of equipment and services for the truck-trailers, automotive, maritime and aerospace industries.

James E. Staniforth

James S. Sarnovsky

Staniforth will direct the planning and development of Fruehauf Division's information systems and Sarnovsky will direct the development of information systems for the division's sales activities.

Staniforth has served as director of management information services for Fruehauf Corp. since 1975. Prior to that, he held various positions including manager of computer technology. Staniforth holds a B.S. degree from Loyola University and an MBA degree from the University of Michigan.

Sarnovsky most recently served Fruehauf Corp.'s management information systems (MIS) department as manager of systems development. Prior to that he served as manager of computer technology for Fruehauf and also as data base administrator for Kelsey-Hayes, a Fruehauf subsidiary.

Sarnovsky earned a B.S. degree from Lawrence Institute of Technology and an MBA degree from Eastern Michigan University.

•••

HUGH V. NAUGHTON has been named manager of office information systems for Firestone Tire & Rubber Co. in Akron, Ohio. Naughton is responsible for directing the design and implementation of office information systems throughout Firestone and the integration of these systems with data processing and communications systems.

Previously, Naughton spent four years with the Arlington, Va., firm of Betace Corp., providing MIS consulting services to the Department of Defense. Prior to that he was a career U.S. Army officer specializing in

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Managers on the Move

DP management and analysis.

He has a bachelor's degree from DePaul University and an MBA degree in data processing and personnel management from George Washington University.

•••

DONALD J. BROWN has been elected vice-president of information and communications systems for Perini Corp., a construction, real estate and coal mining firm headquarted in Framingham, Mass.

Brown joined Perini in 1973 as manager of corporate data processing after working for Commercial Information Corp. and Wang Computer Services.

He graduated from Clarkson College of Technology.

•••

MICHEL VITIELLO has been appointed director of international systems of United Technolgies' Inmont Corp., a producer of printing inks and automobile paint headquartered in Clifton, N.J.

Vitiello was previously vice-president of management information services at Church's Lumber Yard in Utica, Mich.

Vitiello holds a French baccalaureate in philosophy from the University of Montpellier in France. He also received both a B.A. degree in psychology and an M.B.A. degree in management from Oakland University, Rochester, Mich.

•••

JAMES C. MILLER has been promoted to the position of Transition Project Manager in James River Corp.'s corporate MIS department in Richmond, Va.

Previously, Miller had been associate director of systems support in the company's Dixie/Northern Information Services Department in Greenwich, Conn.

He earned a B.S. in accounting from Penn State University, an M.S. degree in computer science from Rensselaer Polytechnic Institute and an MBA in finance from the University of New Haven.

•••

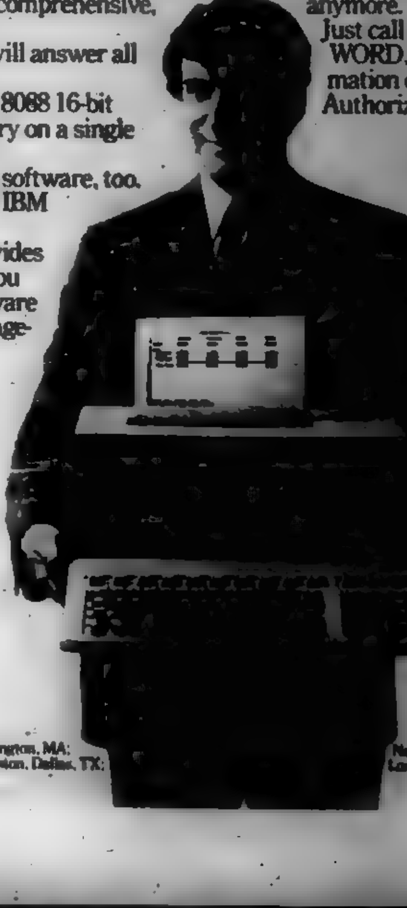
JOHN P. SULLIVAN has been appointed manager of data processing operations for the Communications Information Services Division of Wakefern Food Corp. in Elizabeth, N.J. He will be responsible for all data processing operations including data entry, distribution, data control, scheduling and communications.

Prior to joining Wakefern, Sullivan was computer operation manager at Mutual Benefit Life.

He attended Brookdale College and Rutgers University.

Donald J. Brown

Michel Vitiello



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And like we say, DOT will answer all your needs, too.

For instance, there's an 8088 16-bit processor, plus 256K memory on a single board, expandable to 704K.

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The operating system is Microsoft's* MS/DOS*, and utilizes dual 3½-inch floppy disks, with storage capacity of 287K each. And an optional Z80 is available to implement CP/M2.2.

So as you can see, DOT provides all the control needed to keep everyone happy. Including the boss.

In short, DOT is the ideal personal business computer for the systems environment, providing both the critical systems tie-in and simple solutions for end-users.

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Warehouse Firm Racks Up Profits, Saves With System

GREENVILLE, S.C. — A 33% increase in productivity and an annual savings of $60,000 in DP costs has accrued from the use of specialized manufacturing software by one of the country's largest makers of custom rack storage systems.

The privately held Engineered Products (EP) specializes in custom-designed automated warehouses. Typically, they are 80 feet tall, occupy 40,000 square feet and store about 14,000 pallets. Storage and retrieval is performed entirely by machine.

Users include both Fortune 500 companies and smaller, regional concerns, ranging across industries as diverse as apparel, electronics and farm equipment. EP's other lines are conventional custom racks, rack and conveyor systems for the textile industry, nuclear fuel storage racks and cable trays. About 300 people work in the firm's three plants.

Before computerizing four years ago, the metal fabricator relied chiefly on manual methods supported by an in-house system running a labor-tracking application and a time-sharing service used for engineering computations.

At that time, large jobs open for long periods were susceptible to inaccurate charges, with the result that the difference between year-end physical inventory and the inventory on record once went as high as $400,000.

The terminal located on Engineered Products' plant floor lets the foreman track the manufacturing process and prevent problems before they occur.

The decision to computerize came out of an 80% annual growth rate, which necessitated more efficient managerial control. The distant location of some acquisitions underscored this need.

After a seven-month study of several major vendors — including IBM, Datapoint Corp., Digital Equipment Corp., and Hewlett-Packard Co. — EP decided on the HP 3000 system, recalled Software Contract Manager Mark Kaiser. The decision was influenced by benchmark studies conducted by Furman University here.

HP was selected because of its Image/Query data base management system, its on-line capability and the reliability of its hardware, Kaiser said. The system has enabled the company to cut manufacturing lead time from about 10 weeks to seven, increase shop floor activity by one-third, boost throughput in production engineering by 25% and triple the estimating department's output.

Transferring engineering computations to an in-house system resulted in a $60,000 annual savings. Automation also cut the difference between year-end physical inventory and inventory on record to $1,200, Kaiser pointed out.

The system permits greater involvement in production control at lower supervisory levels. "For instance, EP's shop foremen are now able to monitor the production levels of their crews on a shift basis, which means they can take corrective action before periodic reports are released to upper management," Kaiser said.

The result is an increase in both productivity and employee satisfaction, since foremen are rewarded with bonuses.

EP's system consists of interconnecting an HP 3000 Series III and a Series 44. The 1M-byte Series III is configured with two HP 7925 120M-byte disk drives, one 7970 tape drive, a 200-line/min 2607 printer and 34 terminals.

The terminals — HP Models 2640, 2642 and 2622 — are located in functional areas such as shop foremen's booths on the manufacturing floor.

The Series III is used for production, while the Series 44 — located in a 25-person DP office — is used chiefly for software development, as well as engineering computations. The Series 44 is configured with one 7925 120M-byte disk drive, a 400-line/min printer and nine terminals.

The company has developed its own software package, EP/3000, to meet the needs of job-shop manufacturers.

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Control Package Helps Ski Manufacturer Glide

SEATTLE — A manufacturing control package is keeping production gliding smoothly here at one of the world's largest makers of skis.

Since the K2 Corp. installed NCA Corp.'s Maxcim/Manufacturing system in June 1980, inventory accuracy has increased dramatically, a spokesman said.

K2 is not a newcomer to computer-assisted operations. The company has had in-house hardware since 1974. "We had most of our financial system in place prior to the NCA system installation," said John McGaughey, the company's data processing manager. "It was custom software that we'd written ourselves."

Although his staff of two senior programmer/analysts and an operations supervisor had written some limited manufacturing resource planning (MRP) software, McGaughey said, "it just wasn't filling our needs. We needed a complete manufacturing system from master schedules through requirements planning, and we just didn't have the manpower or the time to do it ourselves."

Integration Without Change

K2 began looking for suppliers of MRP software that would be compatible with their Digital Equipment Corp. hardware and homegrown financial software. "We looked at a number of suppliers," McGaughey noted. "NCA's Maxcim/Manufacturing system impressed us most. We wanted to integrate it with our existing financial system, without major changes to either. NCA's system lent itself to this and NCA offered training that would allow us to do it."

K2 bought the manufacturing system and the accounts payable module from the Maxcim/Financial system and set up a five-person implementation team. The team consisted of representatives from production control, data processing, accounting, production and engineering, McGaughey said.

The team took a week-long NCA training course, while K2 sent two programmer/analysts to NCA for an in-depth technical seminar on the workings of NCA's FMS data base, the foundation for NCA software.

The programmers were charged with writing interfaces to K2's existing financial software. "We needed to know the workings of FMS to extract what we needed from the software," McGaughey said. "We didn't have to modify the NCA software at all. We did some 'exterior' work — for example, letting our general ledger feed from all necessary places in the system."

The company installed the manufacturing system gradually, bringing in first the inventory, then bill of materials, purchasing and accounts payable modules. Then the work order module was brought up in a pilot production area. The rest followed in a "natural sequence," McGaughey said.

Installing the NCA system "most definitely" required a change in the company's management techniques, he added. "After all, our prior computer controls were pretty much a localized function, with financial software accessed by accounting and financial people. No one else really needed it."

The implementation team helped expand the system to include users at many different levels. "The combined system has some 40 terminals with most control from the manufacturing side," McGaughey said.

The prime benefit of the manufacturing system has been control, the DP manager added, an advantage that required a change in management style. "We actually rearranged our shop," he said. "We use a controlled-stores approach now. When an operation is finished, the goods move into the controlled store and they must be checked out of that store before they can proceed to the next operation." With that new level of control available, McGaughey said, "it's now much easier for us to react — to increase a run of skis, for example, or even to stop a run when we know what we really have."

McGaughey offered a concrete example: "Take our inventory. It had been running at about 65% to 70% accuracy. Now it's running more than 90%. The higher the accuracy, the more materials savings we have. And that's like dollars in our pocket."

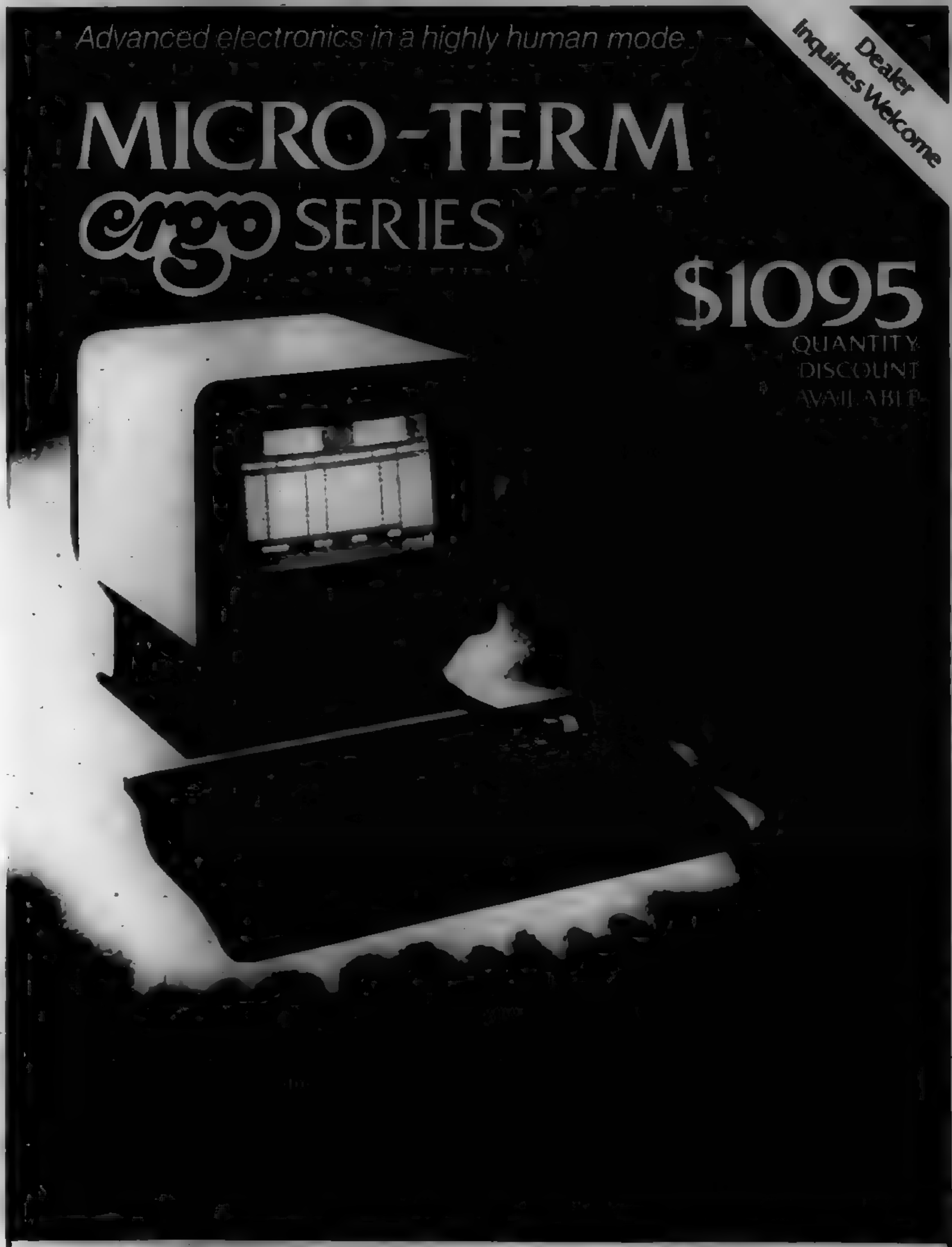
Seminars Scheduled On Communications

ORANGE, Calif. — A series of three-day seminars entitled "Data Communications Systems, A Practical Guide" will be offered in Canada by the Center for Advanced Professional Education, Inc. (Cape).

Major topics to be covered include: carriers and regulations, media, network elements, modems and modulation, modes of operation, codes, interfaces, protocols, message format requirements, hardware, transmission integrity, network transaction and application types, system design considerations, synchronous vs. asynchronous and operation alternatives for users.

Canadian locations and dates are: Montreal, Jan. 19-21; Toronto, Jan. 24-26; Calgary, Feb. 9-11; and Ottawa, Feb. 16-18.

Registration fee and course workbook is $695 from Cape at 11928 N. Earlham, Orange, Calif. 92669.



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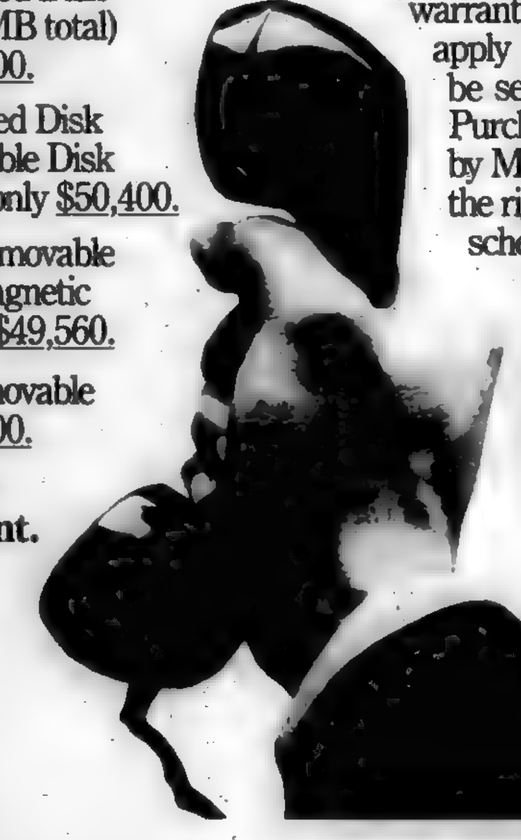

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Tech Causing Uncertainty Among MIS Execs: Professor

By Jeffry Beeler
CW West Coast Bureau

LOS ANGELES — Managers of business information systems have entered a period of "extraordinary change" characterized by a convergence of formerly discrete technologies, according to Dr. Richard Byrne, who teaches at the University of Southern California's Annenberg School of Communication.

This convergence, in turn, has plunged management information systems executives into an era of "unprecedented uncertainty," Byrne explained during a recent interview.

Until just a few years ago, all the available electronic media for storing, processing and disseminating information held little relevance for each other. "Television was television and computers were computers, and neither side ever talked to the other," Byrne said.

But today, all the formerly separate electronic technologies are "blending together," he added, and "absolutely no one knows how all the pieces will eventually go together. A lot of people who used to be very competent and confident aren't any more."

One of the most significant of today's converging technologies is commercially oriented personal computers, that are causing a basic, "structural" change in information management and in the "business of doing business," Byrne said.

Although traditional, highly centralized DP is unlikely to fade from the scene anytime during the foreseeable future, the process of managing corporate information will have to be revised to take into account individual variances in user creativity.

"There may not be one system protocol that applies equally to everybody," Byrne said. "We may have to handle individual variances in a way that would have been counterproductive a few years ago."

Byrne — who also serves as an associate with Mill Valley, Calif.-based American Consulting and Training, Inc. — disagrees with big-company DP managers who regard commercial microcomputers as a "fad, a joke, a mere blip on the radar screen." Computing professionals who think that way are overlooking personal computing's networking potential and its ability to force companies to redefine what information should be controlled, released and coordinated, he said.

Byrne's comments came shortly before he was scheduled to appear as the featured speaker at a meeting of the Data Administration Management Association (Dama). The meeting, which took place aboard the *Queen Mary* last month in nearby Long Beach, Calif., marked Dama's first anniversary as a users group.

Despite their potential to trigger profound corporate and information-management changes, personal computers still face some serious obstacles to their effective implementation. One of those barriers is fear of technology.

"DP managers fear the new technology because they think that executives will demand access to information that will corrupt and pollute their companies' data bases," Byrne said.

To cope with their misgivings about micros, DP managers have only one truly effective course of action available to them: to learn as much about the very small machines as they can, Byrne said.

Byrne also urged DP managers to abandon many of their preconceived ideas about how corporate information management should work, especially the cherished notion that centralized, tightly controlled computing departments will remain the core of business decision making.

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Calendar

Week of Feb. 6

Feb. 7-10, Philadelphia — **Computer Auditing.** Contact: Information System Resources, Inc., 144 Balsam St., St. Paul, Minn. 55122.

Feb. 9-11, Washington, D.C. — **Advanced Business Communications Networks.** Contact: Continuing Engineering Education, George Washington University, Washington, D.C. 22052.

Week of Feb. 13

Feb. 14-16, Washington, D.C. — **Selecting Small Computers for Government and Business.** Contact: Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

Feb. 14-16, Washington, D.C. — **Facilities for Auditing IBM's OS/VS Operating Systems.** Contact: Marge Cohen, Registrar, MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

Feb. 14-16, Washington, D.C. — **Auditing & Security Concepts for IBM's MVS Operating System.** Contact: Marge Cohen, Registrar, MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

Feb. 14-16, Washington, D.C. — **Auditing & Control Concepts for IMS.** Contact: Marge Cohen, Registrar, MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

Feb. 14-16, Summit, N.J. — **Job Control Language.** Contact: Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

Feb. 14-16, Summit, N.J. — **MVS Dump Debugging.** Contact: Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

Feb. 17-18, Washington, D.C. — **Auditing Cobol Application Programs.** Contact: Marge Cohen, Registrar, MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

Week of Feb. 20

Feb. 21-25, Chicago — **Structured Design and Programming.** Contact: Predictable Systems, Inc., Suite 825, 39 S. LaSalle St., Chicago, Ill. 60603.

Feb. 22-24, Summit, N.J. — **Vsam in Cobol.** Contact: Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

Feb. 25-26, Teaneck, N.J. — **Strategic Planning for Information Systems.** Contact: Priscilla Goudreault, Education Coordinator, Q.E.D. Information Sciences, Inc., 180 Linden St., P.O. Box 181, Wellesley, Mass. 02181.

Feb. 25-26, Atlanta — **Advanced Program Control Techniques.** Contact: Technical Marketing Society of America, 59959 W. Century Blvd., Los Angeles, Calif. 90009.

Week of Feb. 27

Feb. 28-March 1, Atlanta — **Using Small Computers in Government.** Contact: U.S. Professional Development Institute, 12611 Davan Drive, Silver Spring, Md. 20904.

Feb. 28-March 2, Houston — **DP Disaster Recovery Seminar.** Contact: DP Security, 181 West St., Waltham, Mass. 02154.

March 1-3, Boston — **Data Analysis.** Contact: Priscilla Goudreault, Education Coordinator, Q.E.D. Information Sciences, Inc., 180 Linden St., P.O. Box 181, Wellesley, Mass. 02181.

March 1-3, Washington, D.C. — **Software Project Development.** Contact: George Washington University, Continuing Engineering Education, Washington, D.C. 20052.

March 2-3, Atlanta — **Developing Small Computer Applications in Government.** Contact: U.S. Professional Development Institute, 12611 Davan Drive, Silver Spring, Md. 20904.

March 4-5, Providence, R.I. — **Conference on Computer Technology: The Challenge to Business and Industry.** Contact: Conference on Computer Technology, Registration Office, Association Internationale des Etudiants en Sciences Economiques et Commerciales, Box 1930, Brown University, Providence, R.I. 02912.

Week of March 6

March 7-10, Chicago — **Systematic Software Design.** Contact: Eduteach, Inc., Suite 907, 162 N. State St., Chicago, Ill. 60601.

March 7-11, San Francisco — **MRP II: Manufacturing Resource Planning.** Contact: Walter E. Goddard, President, P.O. Box 313, Newbury, N.H. 03255.

March 7-11, Dallas — **Assets Protection Course.** Contact: American Society for Industrial Security, 2000 K St., Washington, D.C. 20006.

CTG Video Course Targets Unix Users

CHICAGO — The Computer Technology Group (CTG) of Telemedia, Inc. has announced a video training course for people interested in learning more about Bell Laboratories, Inc.'s Unix operating system.

"Unix Overview" consists of six units: an introduction; files, data base and data communication; Unix commands; the shell; programmers workbench; and Unix security and "C." The course is aimed at people who use Unix as an application development tool or who work with Unix-based applications.

The entire course costs $2100. Telemedia's CTG is located at 310 S. Michigan Ave., Chicago, Ill. 60504.

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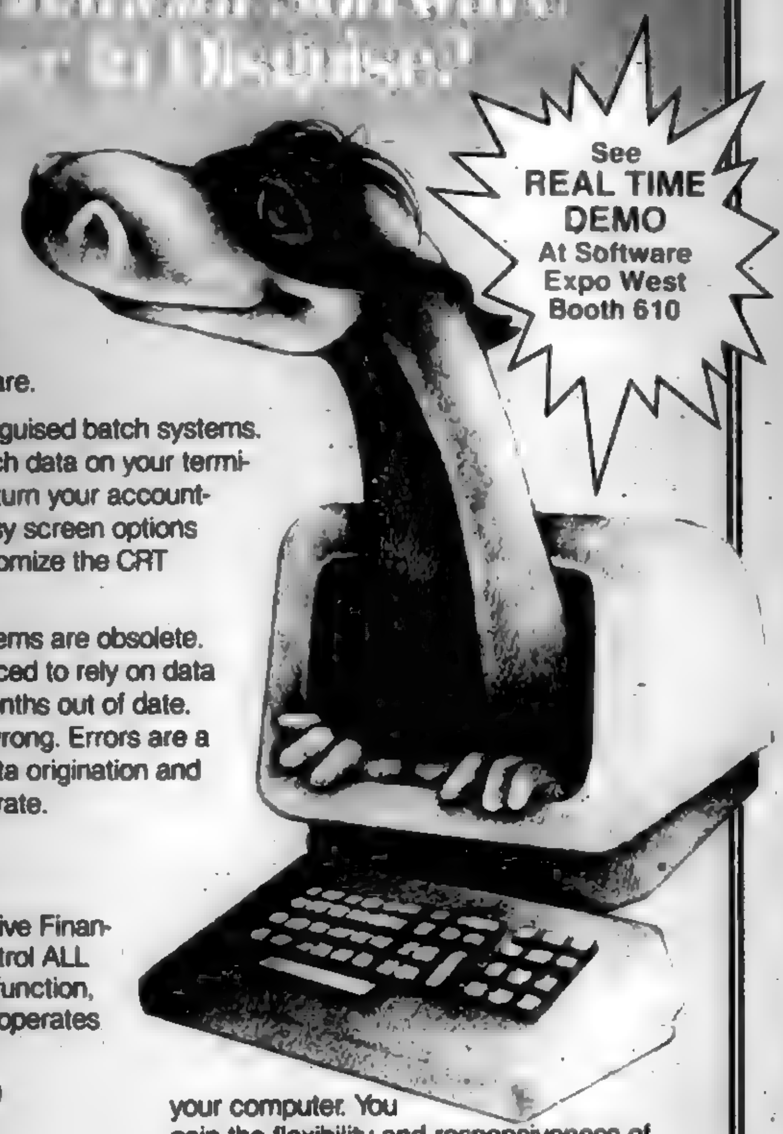
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Researchers Tackling Football Injuries With DP

CHICAGO — Although most football injuries are minor, nearly 200 players over the last decade have suffered permanent paralysis or brain damage despite being swathed in seemingly sturdy equipment. Finding out whether equipment can be designed to shield players from tackles carrying a force of 5,000 pounds and just how much of that force can be safely absorbed is the basis for a study here involving a team of researchers from the Illinois Institute of Technology (IIT).

A three-man team led by Ray Vanderby Jr., an assistant professor of mechnical engineering, is using computer technology to find out exactly what happens during a head or spinal injury — for example, the number of pounds of force it takes to break a man's neck.

Eventually, research results should point toward the type of material properties needed to strengthen a helmet to prevent or minimize injuries, Vanderby said. To compile data, the trio uses IIT's Prime Computer, Inc. Prime 400 minicomputer running on the vendor's Primos operating system and Tektronix, Inc.'s Plot 10 graphics and terminals.

To obtain data, the researchers view game films in which an injury has occurred and project the film, frame by frame, onto a digitizer to digitize the positions of the players during the incident. With the players' physical statistics, positioning and film speed, Vanderby can get a good estimate of the positioning, velocity and acceleration at the moment of impact.

The results are displayed on a series of graphs which show the force in pounds that the player absorbs at points of his body and points in time. The computer also produces a series of drawings that show the relative positions of the players at intervals of one-hundredth of a second — much faster than is recorded on game films.

Vanderby's team has collected data on various helmet types, using an on-line data acquisition microprocessor with a loading frame to gather mechanical parameters such as force vs. displacement and energy absorbed vs. time. With this information, the researchers can recreate a situation alternating helmet types and material properties to compare player response and extent of injury sustained.

Past Experiments

In the past, similar experiments were carried out either using humans at low impact levels, cadavers or animals, "but all fell short of finding out how live humans get injured," Vanderby commented.

The researchers spent a year, mostly part-time, developing their own software, which included a Fortran program, a data base system for storing information and an interactive plotting program to draw figures. Although they had 90% of the software up and running in three months, they spent the rest of the year trying to make the remaining 10% "more user-oriented."

Vanderby foresees the possibility of the study's results being used to point out more graphically to National Football League officials the risks involved in various situations. This, in turn, could be used to force strict enforcement of current rules.

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EDITORIAL

Think Twice

The ruling in the IBM vs. Bridge Technology, Inc. civil suit [CW, Dec. 6] has become a hot topic of conversation in some legal circles. According to one New York lawyer who specializes in trade secret litigation, the broad language of the consent order and permanent injunction issued in that ruling as it defines "trade secrets" could prevent the defendants from ever working in the computer industry again.

The ruling was the outcome of a lawsuit that IBM filed in September against Lewis Eggebrecht and Peter J. Stearns, two former IBM senior engineers, and a third former IBM employee, William W. Erdman. The three had formed Bridge Technology in order to market products in the IBM marketplace; IBM charged them with attempting "to sell design information relating to unannounced IBM products in the personal computer field."

Moreover, IBM feared that the trio's knowledge of IBM's Personal Computer designs and strategies would give the start-up company an unfair advantage and thereby sap IBM profits in this market.

The case ended with a permanent injunction barring Eggebrecht and Stearns from revealing or using any IBM trade secrets or confidential information and prohibiting them for three years from designing, developing, manufacturing or marketing computer products relying in any way upon trade secrets or proprietary information.

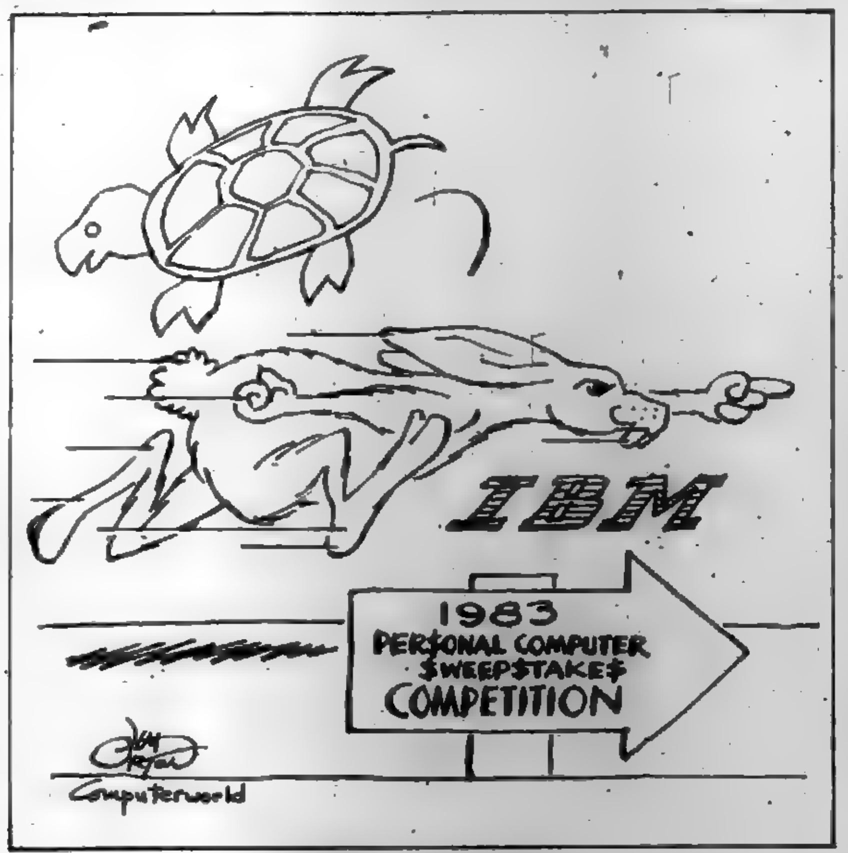
Current debate about the ruling centers around the definition of "trade secrets" and "proprietary information." The injunction defines them as including "all ideas, inventions or designs related to or suggested by . . . IBM" and "information that has not been publicly disclosed by IBM."

That definition is "extremely broad," said trade secrets expert and attorney Alvin Stein of Parker, Chapin, Flattau and Klimpl. "It seems as if the defendants are excluded from the field of IBM [products]. I really question how these people can do anything without going afoul of this agreement," he said in a recent interview. IBM itself would not comment on the ruling's relative harshness or leniency.

There are two possible reasons why the defendants opted for settling on such unfavorable terms in the decree, Stein said. "One is that they were caught red-handed and IBM had such a strong case" that the defendants believed they could not do any better. Secondly, "the defendants may not have been able to bear the cost of litigation."

Some observers believe IBM wielded a pretty big stick in this matter, using its extensive resources to squelch the three defendants' admittedly damaging efforts. This — combined with the computer giant's recent snaring of two major Japanese companies last year in a trade secrets buy-off — indicates that the company is cracking down on those that would steal the crumbs off the IBM banquet table.

So the real message in the verdict is that IBM is ready to make examples of those close to the company with higher ambitions. Both established and start-up companies will have to think twice before deciding to tackle a market in which IBM already has a presence.



'Off With the Turtle Suit'

LETTERS

Entry-Level Problems

During the past year I have discussed the shortage of skilled programmers and programmer/analysts with at least 50 different senior DP executives. All of them have had difficulty recruiting and/or retaining experienced personnel.

College and technical school graduates with one or two years of experience have been in short supply as long as I can remember. At least 50% of the executives with whom I spoke stated that they never hire new graduates. Instead, they recruit people with one or two years of experience.

Granted these random conversations cannot pass any test of sampling techniques or statistically reliable analysis. Nevertheless, I am convinced that companies that refuse to hire new college or technical school graduates are the major cause of the shortage of experienced DP professionals.

I frequently read that universities and technical schools are not educating enough programmers. If this is true, why is my file overflowing with resumes of highly qualified recent graduates?

If you are part of the problem, please get busy and become part of the solution. If your company is part of the problem, and you have no control, please resolve to become part of the solution if it is ever within your power.

It is not easy to run an effective training program that can develop new graduates into productive professionals. As a matter of fact, I don't know anyone except some major accounting/consulting firms who feel they do a good job in this area.

Fortunately, the quality of today's graduates is such that we don't have to do a good job. It is enough to give them a desk and assign them to assist a senior staff member. Of course it would be better to have a comprehensive plan for developing these people.

However, if the choice is between poor training and not providing any entry-level positions, I believe it is preferable to provide the positions.

Certainly the shortage of skilled people will persist until there is an adequate number of entry-level positions to provide for the growth that we continue to experience.

We must either provide the entry-level positions or continue to be faced five years from now with the same project delays, due to lack of experienced staff, which we are facing today.

A.W. Holtsberry

Westerville, Ohio

. . And Hiring Techniques

"Mitre Offering List of DP Jobs Via At-Home Dial-Up Service" [CW, Dec. 10] might have noted that dozens of Mitre Corp.'s progressive competitors in the New England job market have been supporting a much more comprehensive service since last fall. Called Connexions, this service is already national in scope and, at $600 per position posted, including all candidate promotion, is more effective than any in-house system could be.

Far from being the "cute gimmick" that the recruitment firm executive in the article labeled it, this approach puts dignity, confidentiality and efficiency into a chaotic job market that otherwise continues to hamper corporate recruiters and candidates with 19th century techniques.

At a time when access to highly qualified candidates is critical and personal computers nearly universally accessible, this cost-effective approach is merely inevitable.

Robert J. Kvaal
President

Connexions
Cambridge, Mass.

SOFTLINE / Werner L. Frank‡

Schemes for a Natural-Language Syntax

In previously published columns of this series, we have examined alternative application development schemes that were based upon language syntax having algorithmic specification form and ordered statements as the underlying approach. In this last column of the series, we describe the area where most attention is now focused: the use of natural language. The table of alternatives presented here is necessarily sparse in entries.

What makes a language natural English vs. English-like? The "almost English" claims have already been cited as attributes of the ordered statement systems discussed in "Ordered Statement, Directed Prompt Schemes" [CW, Dec. 20]. Perhaps the line of demarcation can only be clarified with examples.

A leading contender for a natural-language capability is Intellect of Artificial Intelligence Corp. Intellect analyzes an English-language query, resolves ambiguities through a prompted dialogue, displays the interpretation of the query and, if acceptable, responds to the final retrieval step and generates the output.

Intellect is deemed an application generator and assigned to position (3,2,2). It is not an integrated solution system because it only facilitates retrieval. The data base will have been generated by some other program, and the special loader utility will incorporate such data under Intellect.

A key to understanding natural-language processing as distinct from a more formatted approach is the extension of the indexing feature common to data bases. In order to broaden the understanding of an English sentence relative to a specific data base, it is necessary to enhance the conventional indexing scheme by a supporting system. This system provides additional meaning to possible words used relative to the data base. For example, if the data involves personnel, then the following synonyms might be appropriate: employee, people, anyone, everyone, personnel, person, everybody, anybody.

Thus, Intellect can be expected to accept and process the following queries with equal ease:

- Print the name of all employees with the name Jones.
- Is anyone's name Jones?
- How many people are there with the name Jones?

Navy Application

An application-oriented natural-language system is the Programmed Language-Based Enquiry System (Planes), shown in the table at point (3,3,2). This system, developed at the University of Illinois, is aimed at supporting the data base needs of U.S. Navy aircraft maintenance and flight information. Planes includes an English-language front end capable of understanding user requests with the ability to carry on clarifying dialogues. The system is also geared to answering vague or poorly defined questions. Planes can handle query requests such as the following:

1. Which aircraft had engine damage in May 1973?
2. Did any planes that had engine maintenance in May have 10 or fewer flight hours in June?
3. What types of aircraft are there?

The first question is a standard type of request that could be asked in any system, though not in the natural form presented here. The second request is a complex statement that involves a good number of interrelationships and cannot be handled by the typical menu-driven or prompting query systems. The third question is general and solicits information about the content of a data base. This facility is not typically available in any other system.

The third example is Tellagraf of Integrated Software Systems Corp. Tellagraf is a conversational computer graphics system that allows the use of natural English to express directives generating graphics output. It is assigned location (3,3,0). To illustrate, all of the following statements assign "millions" to the Y-axis label:

- Y-axis label is "millions."
- Label the Y-axis "millions."
- "Millions" is the Y-axis label.
- The Y-label is "millions."
- Put "millions" on Y.

Natural-language systems of the type described here are "natural" with respect to query only. Defining and generating the data base, developing the indexing system and the semantic extenders are specialized requirements that still depend upon more conventional programming techniques.

This survey leaves acknowledged gaps in the array of alternatives for natural-language systems. This reflects, of course, the state of today's technology.

What may prove to be even more exciting is natural-voice input. Limited-vocabulary systems with this capability are now in an early prototype state. Systems useful for business purposes, however, may not reach the market until the early 1990s.

Werner L. Frank is an independent consultant and president of the W. L. Frank Computer Group located in Calabases, Calif.

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Implementation Schemes for Natural Language Syntax

HUMAN CONNECTION / Jack Stone‡

A Few Words From DP's Future Rank and File

This is the first article in a six-part series, "Computers and the Collegians," coauthored with Joanne Barker.

They're not too knowledgeable about our blissfully remote, mysterious, challenging and complex universe of data processing, but bless 'em, collegians sure are eloquent about it.

We recently interviewed several seniors from the current crop to obtain their opinions about computers and found it a totally refreshing experience, so much so that we decided to share our findings on the views of the future rank and file of the industry in this new series of six articles.

The three we talked with are not intended to be a scientifically chosen sample; they were all we could crowbar away from anointed rounds of boisterous holiday parties. Our enticement of implied notoriety from a *Computerworld* write-up wasn't all that appealing, but the offer of some hot rum toddies before a roaring fire at an ocean beach house was.

We can't prove that our subjects were any more worldly wise than others, but if they were in any way representative, we have to say that seniors these days are delightfully charming, terribly honest and openly expressive. Their views were both fascinating and enlightening and covered the broadest range of subjects:

- The impending hunt for computer-oriented jobs.
- The quality of computer science courses at their institutions and their relationships with DP centers and how these organizations affected their perspectives of the industry.
- The effectiveness of the DP career counseling programs.
- Alternatives to a four-year degree for development machine skills.

According to Pearl Marshall, an A-minus student and computer science major at a small private college, "During my first two years, my career goal was in the veterinary sciences, but my first exposure to a Digital Equipment Corp. VAX-11/750 in my junior year abruptly changed my mind. I knew then I was destined for a DP career because I felt I could conquer the machines and use their tremendous assets for my benefit.

"But I'm surprised there has been no discernible effort on the part of the school, my instructors or industry recruiters to encourage me, or others in my department, in this direction, despite the presumably great needs for people with my skills."

Bob Stewart, a C-average student majoring in philosophy at a private college, said "I am fully aware of the desirability of a DP background, so I planned ahead for a computer science minor. However, I had such poor experiences with my first two courses in the field — computer basics and microprocessing — that I flat out dropped the idea.

"Compared with the dozens of others I've taken over the past three years, those courses were terribly disorganized. I suppose it's partly due to the fact that our school just started the curriculum last year. But that doesn't excuse one instructor from both admitting to the class that he was 'sidewinded' into teaching it and from doing a 'rotten job' with the first exam. And there was no justification for a textbook that was irrelevant to the lecture material."

Tony Charles, a senior, B-plus student and business major at a large state university, explained "Computers were not a mystery to me because I had plenty of 'hands-on' with my father's micro. So I expected to do well with an introductory course in Fortran. Boy, was that ever a total disaster!

"There were nearly 200 students in the lecture sessions, the instructor was awful, machine access was ridiculous, the textbook was incomprehensible and the teaching assistants were foreigners who couldn't easily explain how to write the programs. I was forced to cheat by submitting debugged programs I acquired from friends.

"If my experience is any guide, the industry will lose a lot of talent unless the educational establishment gets its data processing act together."

READER COMMENTARY/Stuart Scott

How to Sit Through a Six-Hour Seminar

When I was in grade school, I looked forward eagerly to what we called assemblies. The whole school would gather in the gym, which was also the auditorium, and we would listen to a speech by a strange grown-up from the big world outside. When I was quite young, the speaker was usually a policeman or a fireman. Later, in high school, he tended to be a narcotics specialist from the Federal Bureau of Investigation.

I always liked assemblies. They broke up the monotony of the school-day routine. So when I left school and got a job, I was delighted to discover that grown-ups have assemblies too, only we call them seminars. And instead of cops and narcs and Smokey the Bear, we get to learn about really exciting things — like software testing techniques. That was the subject of a six-hour seminar presented recently to my department.

It was a fair to middling seminar, conducted in the modern "overhead-driven" style. That means that the speakers use overhead projectors to display typed outlines of their talks. Since the print is so small and can be read only from the front row, they make photocopies of the outlines and hand them out to each member of the audience. This takes care of everybody who knows how to read. For the benefit of everyone else, they read the outlines aloud.

I would say that our speakers had almost mastered this new style of public speaking, although they evidently lacked confidence in its effectiveness. It surprised me that they felt it would take six hours to bore and befuddle us. A first-rate seminar speaker, in my experience, can generally accomplish the same result in 40 minutes — less with a good tail wind.

Although the speakers were good, the audience was better. They knew precisely what was expected of them, especially those in the second row from the back of the hall. As you may know, this is where you find the best talent at seminars. These old pros know that in seats closer up, the glare from the overhead projector burns through their closed eyelids.

The folks in the second row from the back were in especially good form at our seminar. If you looked down the row at about 2:05, you saw 10 people slumbering in a line, their heads settled back against the wooden railing behind them, their faces upturned with expressions of undistracted tranquility, quite like a beach full of early-summer sun worshippers.

Seminar 'Specialists'

A good seminar audience, like a good football team, has to have specialists. Particularly important are the Incomprehensible Questioner, who specializes in interrupting the speaker to ask long, meandering questions that have nothing to do with the subject; the Last-Minute Inquirer, whose job is to make every session run 20 minutes late by asking "just one last question" after another; the Terminator, who asks the traditional closing question: "Just what was the point of all this, anyway?"; and the Minstrel, who answers the Terminator with the graceful and intricate "Song and Dance."

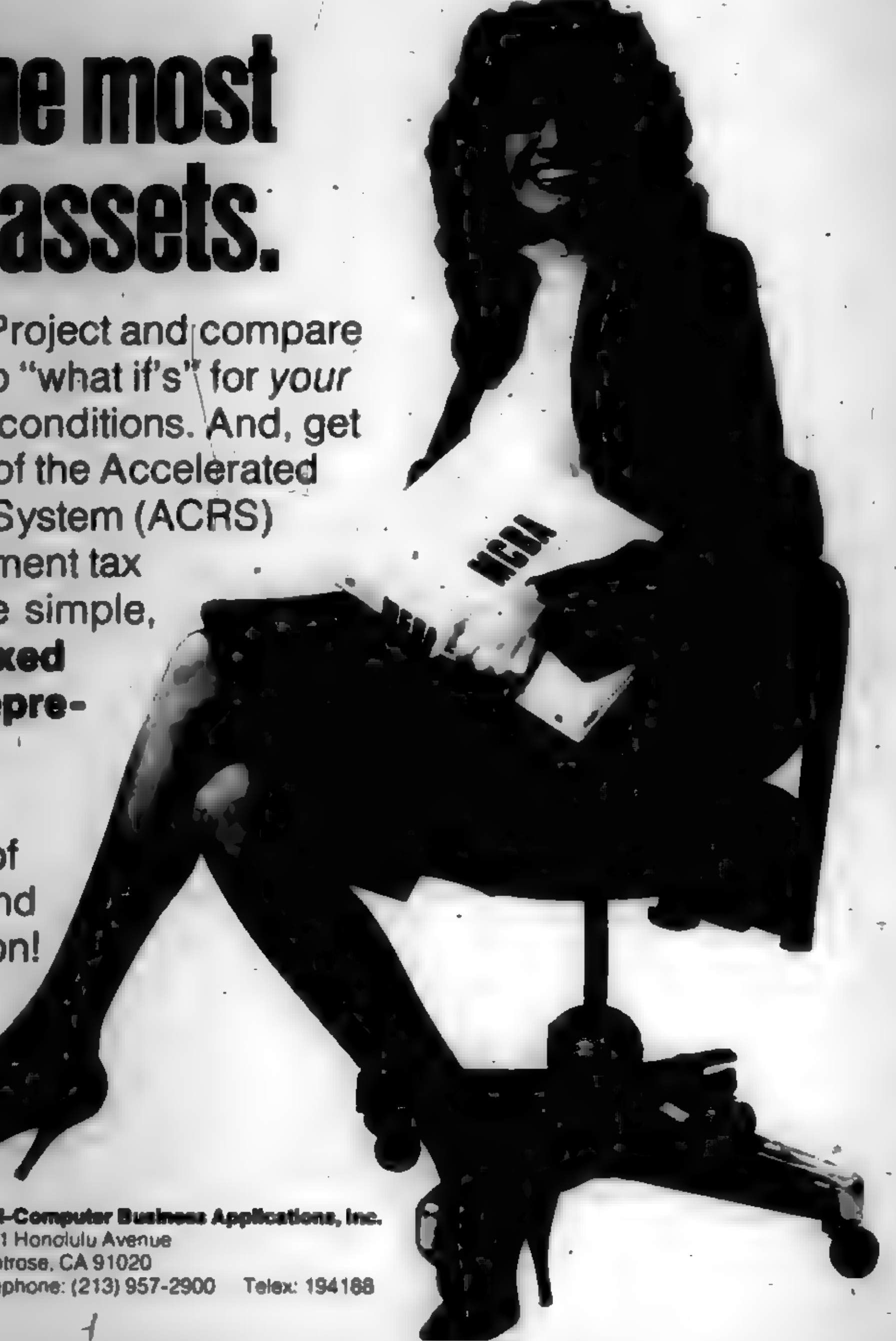
The top prize for a freestyle performance by a member of the audience went, predictably, to one of the supervisors — I'll call him Bill. The seminar was in its final hour. Bill was sitting rigidly at attention in the center of the last row, setting a good example for the troops. Sally V. Whozit was explaining her new testing procedure for about the 12th time. Just behind me, a couple of women were speculating on what the 'V' in Sally's name stands for.

Suddenly, I heard an awful, choking cough from the back of the room. It was Bill. He was staring straight ahead, wide-eyed and red-faced. His body shook, and his lips were clenched in a ghastly grimace. He looked as if he had swallowed a pencil. I was trying to remember how to perform the Heimlich Maneuver when the fellow beside me said, incredulously, "He's laughing!" Sure enough, he was. Like a boy in church, ashamed of himself, yet unable to stop, he laughed on and on in stoic misery.

Finally, his laughter began to subside. Then someone asked Sally Whozit to explain her procedure for the 13th time, and Bill was off again. For the rest of the session, every time someone asked a silly question, Bill just fell apart; I never saw anyone laugh so much.

An hour later, when the session was over, I tracked him to the couch in the nurse's office and asked him where he had found the inspiration for such a performance. "The seminar was so stimulating," he gasped, "that I just couldn't contain my enthusiasm any longer."

Scott is based in Milwaukee, Wis.



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Insurer Ends Outage Problems With 'Dads'

By Paul Gillin
CW Staff

HARTFORD, Conn. — Until recently, the management information systems department at Connecticut General Life Insurance Co. was bedeviled by a frequent and frustrating problem. Every couple of days, when the computer system was brought up, it would suffer a job control language problem. The resulting system shutdown would idle 2,000 terminals across the country for 10 to 15 agonizing minutes.

"The greatest problem we had was that in just one copy of CICS there are 6,000 programs and 500 files spread over perhaps 15 applications," said Doug Price, manager of CICS development. "The system depended on the files being in good structural order when the system was brought up. But because of troubles during the night, we couldn't always rely on the data sets being available to CICS in the morning. So we were constantly having [job control language] errors as a result." Each time the system went down, the entire network was paralyzed, he said.

As one of the country's largest life insurance companies, Connecticut General uses a nationwide computer network connected to seven IBM 3033s and 3081s at its headquarters here. The support staff consists of manager Price, a staff of seven CICS systems programmers and five systems programmers in the Integrity Support Group. More than 20 copies of CICS are used to process 1.5 million user transactions daily. The company's dental system alone sees a third of those transactions, Price said.

(Continued on Page 42)

STSC Introduces APL*Plus/1280

ROCKVILLE, Md. — STSC, Inc. has announced the release of APL*Plus/1280, which reportedly is composed of the firm's proprietary enhancements and extensions to IBM's VS APL product implemented in IBM MVS/TSO environments.

The APL*Plus/1280 offering includes an on-line dump that permits 24-hour system availability; read/writing chaining; enhanced utilities and configuration control; and an improved file-print facility that is used directly rather than by means of shared variables, the vendor explained.

The software also is said to include STSC's Nested Arrays System, its Sharefile system, its Emma data management utilities, software development tools, programmer utility work spaces, an error-handling facility and formatting features.

APL*Plus/1280 requires an IBM 4341, 370/145 or larger, IBM 30 series or plug-compatible mainframe capable of running MVS. It was designed to be a fully compatible superset of IBM's VS APL program product and reportedly requires no changes to MVS or TSO.

The offering is available for a one-time license fee of $70,000, with an annual support and maintenance fee of $10,500. The perpetual license may be paid in 36 monthly installments of $3,500, including support and maintenance. APL*Plus/1280 may be licensed for a minimum of six months at $3,500/mo, including support and maintenance.

STSC is located at 2115 E. Jefferson St., Rockville, Md. 20852.

Fits IBM Machines

'Impacts,' 'Standard' Unveiled

DAYTON, Ohio — Convey Companies, Inc. has announced an on-line application generator called The Standard. At the same time, the company released Impacts, an on-line loan-closing system.

Both packages run on IBM 370, 30 series and 4300 series computers utilizing CICS with OS or DOS and Vsam files.

The Standard employs an event scheduler that drives a multipurpose program that resides in memory, a spokesman said. The program consists of a group of precoded assembly language functions that execute many business processes. A user-defined data dictionary and CRT screen create the event schedules that control the applications process and creation of the data base, the spokesman added.

Data base creation is via on-line data entry. Display and update security is provided at element, screen and record levels. A transaction journal reportedly logs each addition, deletion and change made.

As changes are made to the data dictionary, The Standard modifies each record to reflect the new requirements of the application. The license fee is $85,000.

Impacts is said to provide a data dictionary of more than 1,500 elements to capture and validate data, perform calculations, track applications, control security, print and move closed applications to the mortgage processing system.

The system includes a comprehensive data dictionary with unlimited expansion, unlimited CRT screen capability, more than 200 predefined calculations, tracking of 99 unique application types through 16 unique processing steps and a tickler subsystem to flag key elements, the spokesman said.

Impacts also incorporates a mini word processor, produces 33 reports and has plot-printing capability, according to the spokesman. A one-time license fee is $35,000 from 3400 S. Dixie, Dayton, Ohio 45439.

'Masterflex Menu' Targets IBM CICS

WAYNE, Pa. — American Data Management Systems, Inc. has released Masterflex Menu, a standardized on-line menu system designed to run in any IBM CICS environment.

Masterflex Menu reportedly provides a two-level, password-protected menu system for application use. Passwords can be required at the system level and at the application level, thereby preventing unauthorized personnel from viewing privileged information.

In addition, this product eliminates the need to write new programs or maintain already existing menu programs and maps, according to the vendor. It provides all end users with a single entry point into the CICS applications, thereby eliminating the need to remember various entry transaction codes.

Masterflex Menu costs $2,100, the vendor said from 154 Homestead Road, Wayne, Pa. 19087.

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Business Package Updated For DG Minis

DUNSMUIR, Calif. — Applied Business Systems (ABS) has announced Revision 1.2 of its Order Entry-ABS interactive business package for Data General Corp. Nova and Eclipse computers under RDOS or AOS. The system includes four major modules: order entry, billing, inventory control and sales reporting.

The package accepts orders, generates a sales order while reserving inventory, then relieves inventory upon creation of an invoice and interacts with the open order master files to report on the status of new and open orders, a spokesman said.

Full or partial shipments are allowed with back-order reporting. The system also allows display, modification, rescheduling, cancellation or release of outstanding orders. When orders are received, customer information from the customer master files is displayed for credit and term checking. As the order is entered, product information from the item master-file is displayed.

Order Entry-ABS can be used as a stand-alone system or in conjunction with other ABS software, including Purchase-Master and Production-Master, the spokesman said. Price is $3,000 for a single CPU or $4,500 for multiple CPUs from 4350 Upper Soda Road, Dunsmuir, Calif. 96025.

'VSEE' Targets IBM DOS/VSE

KANSAS CITY, Mo. — Little Blue Systems, Inc. (LBS) has introduced an on-line transaction monitor for IBM and plug-compatible DOS/VSE systems called VSEE.

VSEE, which represents LBS's entry into the performance monitor and system utility market for IBM 370 systems, is said to provide four screens of partition information. Two screens display activity status for one background and 10 foreground partitions. Categories include current partition priority, task information block flag, user program sense indicator, job name and description from DOS job card, current phase execution, CPU and start time of current phase being executed, devices being used by that job and the number of start I/Os for each device. The screens also list up to 10 tape devices and their partition assignments, the spokesman said.

A third screen lists and describes up to 92 I/O devices in the system, tells where they are assigned and shows what volume is currently in use on tape and disk drive. A fourth screen provides a snapshot of the current system console display, the spokesman said.

VSEE leases for $608/year from LBS through P.O. Box 19867, Kansas City, Mo. 64141.

Honeywell DM-IV Users Get Data Dictionary Package

MECHANICSBURG, Pa. — CACI-Federal, Inc. has announced CACI/DDS-4, a data dictionary, directory and documentation package for users of Honeywell, Inc.'s Data Management IV (DM-IV) and Transaction Processing software.

CACI/DDS-4 currently supports Honeywell Level 66 and DPS 8 processors running under Honeywell's Gcos operating system and using Cobol 74.

The package acts as a central repository for documentation for all application programs and a comprehensive map of all data entities and their relationships. The data dictionary contains, among other things, information about data elements, programs and applications systems affecting data and user organizations that might be responsible for maintaining data, the vendor said.

CACI/DSS-4 operates in a Honeywell DM-IV Integrated Data Store-2/TP environment using both batch and on-line processing to update the data dictionary. The package can provide both hard-copy reports and on-line inquiries for the DP staff, data administrators and DP auditors.

Schema, Subschema and Cobol program source files are used as input to generate information in CACI/DDS-4, the vendor said.

CACI/DDS-4 costs $23,000 including one year of maintenance. Leasing terms are also available, the vendor said from 5010 Trindle Road, Mechanicsburg, Pa. 17055.

Cash Management System Debuts

SHEBOYGAN, Wis. — Heritage Computer Corp. (HCC) has introduced a Cash Application Management System (Cams) for IBM mainframes running CICS.

Cams is designed to handle and control cash receipts and insurance applications and to facilitate distribution of cash payments to the proper ledger accounts.

The software is designed for use by companies having the HCC All Lines Premium System and the HCC Claims System. Geared toward same-day bank deposit of funds, Cams is an on-line system utilizing IBM's CICS software. Cams is written in Ansi Cobol.

Cams carries a one-time license fee of $15,000 from the firm at 2300 Kohler Memorial Drive, Sheboygan, Wis. 53081.

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'MS/CS' Introduced For Four Phase MFE

ARLINGTON, Texas — Legist Automation, Inc. has introduced a software system that reportedly provides control, accounting, security and audit functions for any Four Phase System, Inc. processor that supports Four Phase's MFE operating system.

The MS/CS software reportedly allows a supervisor identified by a password to view actual images of all screens on the system and to take control of the screen from the operator. This enables the supervisor to shut down the system, even if other terminals have been left connected.

MS/CS logs all system activity, enabling easy accounting and auditing. Its built-in security features include console and password control of access for each application, according to the vendor.

This product costs $3000, the vendor said from 1212 Millbrook Drive, Arlington, Texas 76012.

Data 21 Enhances RPF Package

TORRANCE, Calif. — Data 21 has announced enhancements to its Remote Print Facility (RPF) package, which provides an interface to IBM VSE/Power Queues to enable users to print, display and submit jobs on 3270-type terminals under CICS.

The enhanced version includes Forms Control Buffer (FCB) support to allow CICS printers to simulate channel commands for forms control, a spokesman said. Table entries to define form name and associated FCB name allow RPF to check for an FCB prior to starting a print task. If an FCB is required, RPF loads it and translates all channel requests accordingly.

With RPF, the spokesman continued, any power report can be printed on any CICS printer as well as on system printers with RPF. If a report is printed with a carriage control tape, it is necessary to create an FCB for on-line printing.

The license fee is $2,100, according to the spokesman from Data 21 at 19110 Van Ness Ave., Torrance, Calif. 90501.

'Reformer' Aids Cobol

WAYZATA, Minn. — Commercial Programming Services, Inc. has introduced a productivity aid for Cobol programs on IBM 4300 series and larger mainframes, as well as plug-compatibles.

Reformer is said to increase programmer productivity by allowing programmers to use the Cobol shorthand feature and by cleaning up old, hard-to-read Cobol programs.

All Data Division and Procedure Division statements are realigned to make the program easier to read and all IF statements are realigned to avoid the confusion of nested statements, according to the vendor.

Reformer costs $1,500 from the firm at 3701 Shoreline Drive, Wayzata, Minn. 55391.

Design Aid Out for IMS

ANN ARBOR, Mich. — Database Design, Inc. has added a hierarchical design aid module to its Data Designer package for users of IBM's IMS data base management system.

Data Designer assists data analysts in developing logical data models that support stable data structures, a spokeswoman said.

The hierarchical design aid looks for natural hierarchies in a logical data model to produce a structural model for IMS. The aid points out issues that must be resolved before implementation.

The current price for Data Designer is $30,900, with the hierarchical design aid priced separately at $3,000. The price for Data Designer will increase to $35,000 on March 1, the spokeswoman said.

Database Design is located at 2020 Hogback Road, Ann Arbor, Mich. 48104.

Finance Tool Gets Upgrade

SKOKIE, Ill. — Data Directions, Inc. has enhanced its client accounting package for the Data General Corp. Cobol compiler. The package reportedly gives the ability to stack unlimited report requests. It costs $6,000 from Suite 12, 5225 Old Orchard Road, Skokie, Ill. 60077.

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Noesis Announces Packages for HP 3000 Users

SAN FRANCISCO — Noesis Computing Co. has announced a line of interactive software that reportedly serves trade associations, membership organizations, meeting planners and publishers.

The software is said to run on the Hewlett-Packard Co. HP 3000.

The three packages — Peopletrak, Meetingtrak and Ordertrak — reportedly store information in a common data base so that the user need only enter or update information once.

Each system is integrated with Noesis' financial accounting software and employs Quasar Systems Ltd.'s Quiz for user-generated inquiries and reports, according to a Noesis spokesman.

Peopletrak reportedly provides on-line management of membership and subscriber information.

Meetingtrak handles small seminars to large conventions, the vendor said.

Preregistration, hotel and session reservations as well as refunds are all reportedly handled on-line.

Ordertrak is said to provide on-line order processing for periodicals, books, reprints and other subscription fulfillment material and includes on-line customer history, pick lists and inventory control.

All packages include invoicing and cash receipts and are available on a time-sharing basis, according to the vendor.

Peopletrak costs $7,000, while Meetingtrak and Ordertrak cost $10,000 each.

Noesis is located at 615 Third St., San Francisco, Calif. 94107.

Insurer Solves Outage Woes With 'Dads'

(Continued from Page 39)

Since he knew of no commercial packages that would solve his problem, Price consulted Software Technologies and Research, Inc. of Rocky Hill, Conn., to develop a dynamic allocation system that would reduce the system's reliance upon complete data set files.

Connecticut General needed a facility for dynamic allocation of data sets so the system could bypass a missing file rather than shutting down. Software Technologies and Research coded a specialized package in about eight months, then completely rewrote the package for commercial use. The package they developed, called Dynamic Allocation/Deallocation Subsystem (Dads), has solved the company's allocation problems. Connecticut General was the beta test site for Dads, which was announced in October [CW, Oct. 18], and has used the commercial package for about six months.

"The key benefit to us has been in the area of [job control language] outages," Price said. "They used to drive us crazy, but since we've installed the package we've suffered no more outages caused by [job control language] problems. We don't even load the [job control language] for user files any more."

Dads has allowed data dictionary statements to be removed from the job control language, preventing an error should a user data set be missing. The file can be allocated when it becomes available, Price said.

The system also incorporates improved diagnostics, and "If there's a problem with allocation, it saves return codes in the Vsam files so we can reference allocation errors or successes," Price said. "That gives us a good picture of what went wrong and allows us to correct and reallocate it quickly."

A dynamic verification feature has enabled systems programmers to bypass the time-consuming process of verifying all files before starting CICS. Dads supposes no verification will be needed, Price said, and opens the files automatically, verifying only where necessary.

More time is saved with a class function that allocates and deallocates whole groups of files with a single command. Now, Price said, a programmer can initiate the function for 15 files by typing in a single command, saving 29 manual steps and reducing the margin for error.

The bottom line on benefits is reliability, Price said. Job control language outages take their toll in time and irritation. With Dads, Price said, "We've eliminated the administrative headaches caused by the whole problem."

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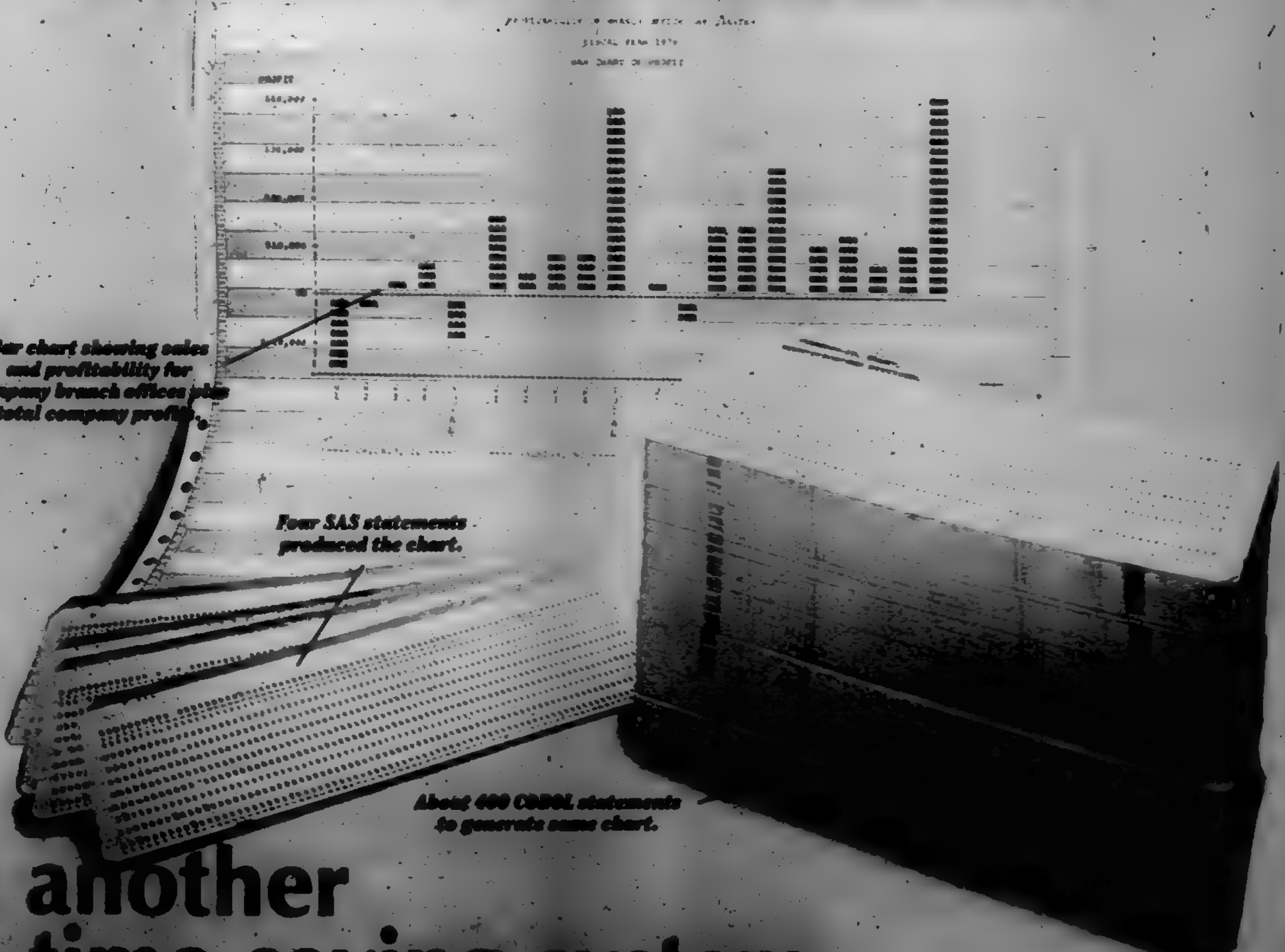
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In Europe: SAS Software Ltd., The Centre, 68 High Street, Weybridge, Surrey KT13 8BL, UK. Phone 0932-55855. Telex 8954665.

Quasar's 'Powerhouse' Announced for HP 3000

OTTAWA — Quasar Systems Ltd. has introduced an application development software package for the Hewlett-Packard Co. HP 3000.

Powerhouse comprises four products: Quick, an on-line system generator; Quiz, a report writer; Quasar Transaction Processor, a batch transaction processor; and Dictionary Plus. They can be purchased individually or as a complete package.

For the entire package, the first copy costs $19,500 (U.S.), and each additional copy costs $9,750. On a one-year lease, the first copy costs $1,170/mo and each additional copy costs $585/mo, a spokeswoman said from 275 Slater St., 10th Floor, Ottawa, Ont., Canada K1P 5H9.

'Bid-Asyst' Tracks Bids

MILWAUKEE — System 5 has introduced an information service that reportedly analyzes bidding histories and market trends for contractors.

Bid-Asyst is said to track bids of competing contractors in order to find weaknesses in their bidding strategies. The package helps users predict how their competition will bid on future jobs, a spokesman said. It also shows contractors how changes in bidding strategies will affect profits and which markets allow more profitable markups.

Bid-Asyst is available on a time-sharing basis with prices starting at $100/mo from System 5 at 615 E. Michigan St., Milwaukee, Wis. 53202.

Finance Aid Targets DG

ARMONK, N.Y. — Exact Systems and Programming Corp. (ESP) has announced the release of an on-line, interactive, transaction-oriented accounting system for Data General Corp. microcomputers and minicomputers.

Accountbase is composed of independent accounting application modules, such as accounts payable, accounts receivable and general ledger.

The modules may be operated as stand-alone applications, or the fully integrated Accountbase systems may be implemented.

Each application module includes CRT screen programs, file-creation facilities and report generation programs, the vendor said. The system may be implemented as-is or modification can be made by ESP or the end user.

One-time costs for use on a specific Data General computer are as low as $3,750, including installation, training and documentation, according to the vendor.

The vendor is located at One Labriola Court, Armonk, N.Y. 10504.

HP 3000 Gets Payroll/Personnel Package

AUSTIN, Texas — Tymlabs Corp. has released a payroll/personnel package for the Hewlett-Packard Co. HP 3000 computer.

The menu-driven system features on-line data entry and updating with instant validation, a company spokesman said. Calculations for the package are based on a predefined file of rates, formulas and parameters.

The package requires no modification to existing programs, according to the spokesman.

Up to 99 companies, each with 99 divisions of up to 99,999 departments may be kept in a single file, the spokesman said.

The package is based on payroll components including hours/earnings, other compensation, voluntary deductions, tax deductions and vacation/sick leave, the spokesman said.

An accounting distribution parameter file allows the user to specify how payroll components are distributed to the general ledger, according to the spokesman.

A general ledger transaction file is created each time payroll checks are produced, reflecting distribution of paycheck components, net check amounts and company cost accruals, the spokesman said.

The package costs $5850 including a menu processor.

Tymlabs is located at 211 E. 7th St., Austin, Texas 78701.

Fortran 77 Source Program Released for Apples

MEMPHIS, Tenn. — Softronics, Inc. has released a Fortran 77 source program that reportedly provides Softrans protocol compatibility for file transfers between Apple Computer, Inc. personal computers and any host computer.

Softrans is used in conjunction with Softerm, the company's high-speed CRT terminal emulation program for Apple computers, to exchange data between the Apple II and any host that provides Fortran 77 language capability.

Softrans protocol, which operates in a block mode using asynchronous communications, reportedly provides error detection with automatic retransmission, automatic binary encoding and decoding, CRC-16 check sum and data compression to enhance line utilization.

The Fortran 77 program is executed on the host system under the control of the Apple II, which when running appears to the host as a standard CRT terminal.

Commands may be entered that allow file directories to be displayed and files to be transferred to and from the Apple and host computer.

The Softerm terminal emulation program includes a 300-page user's guide; terminal emulation for the IBM 3101, Digital Equipment Corp. VT102 and VT52, Televideo Corp. 910 and similar computers; the Softrans protocol; and Fortran 77 source program.

The program is available for $150 from Softronics, 6626 Prince Edward Place, Memphis, Tenn. 38139.

Ada Exchange Announced

MADISON, Wis. — RR Software will be sponsoring an Ada software exchange that is reportedly geared to provide low-cost or public domain software to exchange members.

The programs and libraries being distributed by the firm are written in the company's Janus/Ada, an Ada subset reportedly designed and developed for the microcomputer systems environment.

A feature of the Ada language is said to be the ability to create libraries of routines that can be used in more than one program.

It is hoped that this feature in conjunction with software exchanges will help promote Ada as a tool to increase programmer productivity, the spokesman said.

Janus/Ada also reportedly offers separate compilation and user-defined types.

Package prices start at $300, the vendor said.

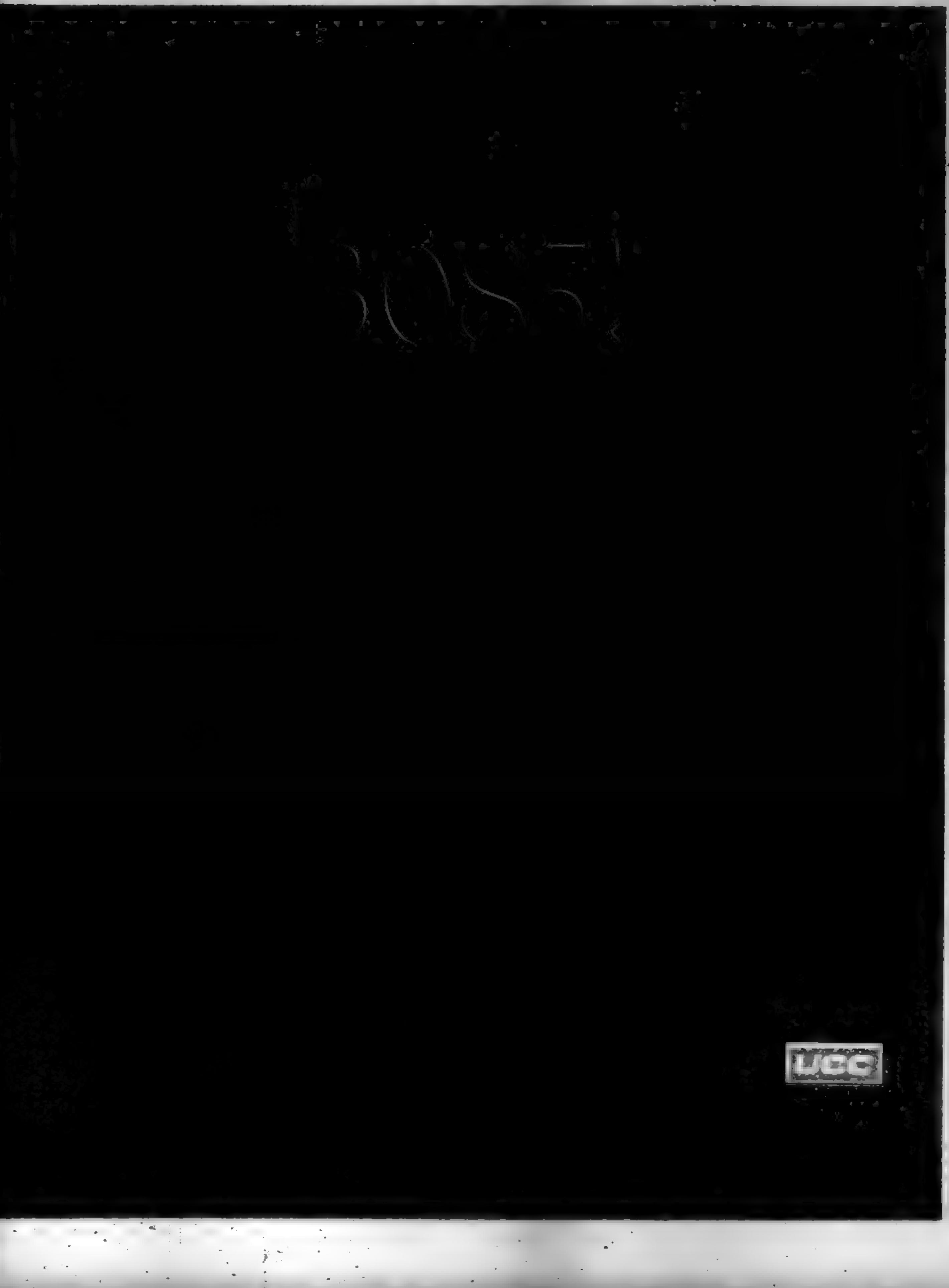
RR Software can be reached through P.O. Box 1512, Madison, Wis. 53701.

Property Firms Get Finance Tool

ENGLEWOOD, Colo. — A financial management system for property management using the IBM System/23 Datamaster has been unveiled by NSI Corp.

The Property Management Financial Management package comprises general ledger, accounts payable, income and deposits and payroll functions. The system was designed to provide accounting control.

The software costs $5,000 from Suite 104, 3375 S. Bannock, Englewood, Colo. 80110.



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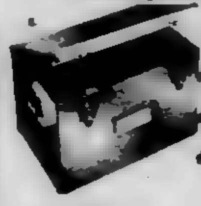

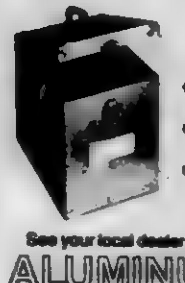

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Runs on DEC VAX

DBL/VMS Version Out

SACRAMENTO, Calif. — Digital Information Systems Corp. has announced that a Digital Equipment Corp. VMS native-mode version of its Data Business Language (DBL) is now available.

With the addition of DBL/VMS, the Dibol-11 source-code-compatible language is now available for DEC RT-11, TSX/TSX-Plus, RSTS, RSX-11M/M-Plus and VAX/VMS compatibility mode. The DBL/VMS compiler is written in VAX/VMS native mode and is said to be a true compiler.

The output of the compiler is in-line native code and entire applications reportedly can be bound into a single module. The price of DBL/VMS is $5,300 from the firm at Suite 340, 3336 Bradshaw Road, Sacramento, Calif. 95827.

CDC Introduces Management System

GREENWICH, Conn. — A liability management system is available from Control Data Corp.'s Business Information Services (BIS).

The Exam system consists of portfolio, balance sheet and analysis and presentation components.

There is a $200/mo minimum usage fee for BIS subscribers, which gives them access to the entire BIS library, CDC said from 500 W. Putnam Ave., Greenwich, Conn. 06830.

HP Discounts Two Series 80 Aids

CORVALLIS, Ore. — Hewlett-Packard Co. has announced discounts on two software packages for its Series 80 computers.

The Personal Productivity Pac includes Visicorp's Visicalc Plus, Word/80 and File/80 packages for a combined cost of $250. The programs enable the user to write memos, letters and reports; create files; and analyze information, a spokeswoman said.

The second offering includes Peachtree Software, Inc.'s Series 8 general ledger, accounts payable and accounts receivable software in a package priced at $1,500. The integrated packages reportedly allow entries to accounts payable and receivable to be posted automatically in general ledger.

Both packages are available in 3½-in. and 5¼-in. floppy disk formats. The offer is good through February 28 from HP at 1000 N.E. Circle Blvd., Corvallis, Ore. 97330.

System/38 Gets 'Recompile'

MEMPHIS, Tenn. — Computer Technologies International Corp. has announced a file management package for the IBM System/38.

Called Recompile, the package reportedly allows users to recreate existing programs due to an alteration of a program or file. Programs may be selected by generic name, library, program type and a file they use. All existing file attributes are retained.

Programs that fail to compile are not deleted, the spokesman added. An optional audit listing can be generated to summarize compilation information and results.

Recompile costs $850 from the vendor through P.O. Box 18621, Memphis, Tenn. 38118.

Inter-Pro Runs Under VRX

CINCINNATI — Bonnecaze, McLeroy & Harrison, Inc. of Dallas is marketing its Inter-Pro interactive language through Software Clearing House here.

Operating under NCR Corp.'s VRX operating system, Inter-Pro is said to allow a programmer to code and test programs from his terminal without link editing or compiling.

Inter-Pro is available at an introductory price of $3,200 from Software Clearing House, 771 Neeb Road, Cincinnati, Ohio 45238.

'Model' Version Runs on Primes

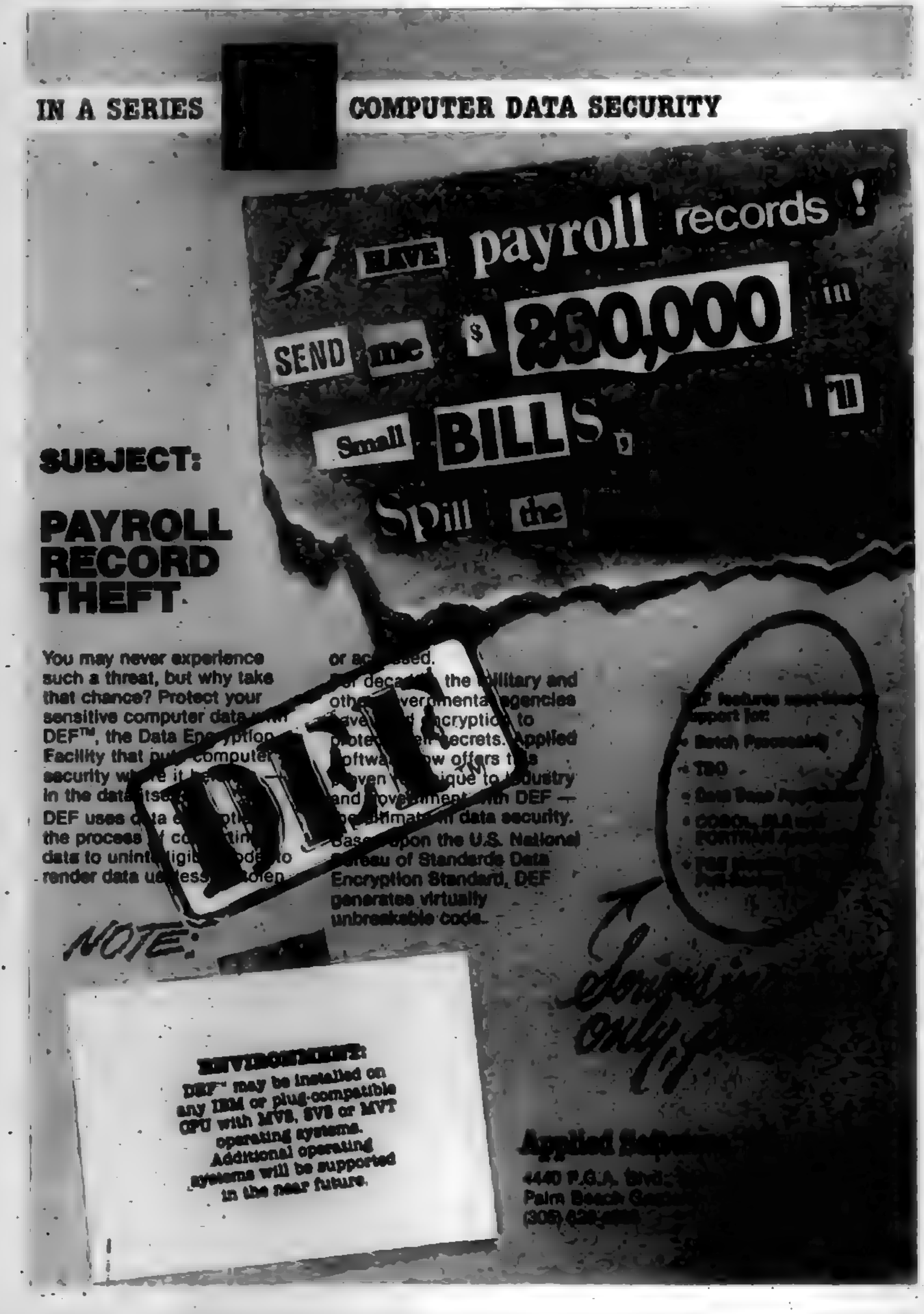
NATICK, Mass. — Prime Computer, Inc. has announced that a version of Lloyd Bush and Associates' Model interactive financial modeling and decision support system is available for Prime computers.

The Prime version of Model is composed of 28 separately priced modules designed to address business applications including budgeting, manpower planning, corporate modeling, merger/acquisition studies and project scheduling, a Prime spokeswoman said.

The entry-level package, priced at $9,000, includes basic budgeting and planning and the production of pro forma statements. The package includes a What If subsystema read/write feature.

A report writer produces standard templates and customized reports; a trace feature performs on-line editing; and a Help facility explains commands and error messages.

Lloyd Bush and Associates is located at 156 Williams St., New York, N.Y. 10038.



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Prompter Out For CA-Earl

JERICHO, N.Y. — Computer Associates International, Inc. has added an on-line prompting facility to CA-Earl, its on-line retrieval and reporting system for IBM and plug-compatible mainframes operating under DOS/VS (E).

Based on user commands, the prompter automatically formats and generates a program to produce the required reports. Release 4.0 of CA-Earl also provides expanded Vsam support, extended features in the execution of user-supplied prewritten programs and routines from within a CA-Earl program, automatic formatting for up to 254 reports with a single sort and the ability to define a numeric field as unsigned packed decimal and to print any field in hexadecimal format.

A three-year lease costs $8,800, the vendor said from 125 Jericho Tnpk., Jericho, N.Y. 11753.

Utility Enhanced For IBM CPUs

GRANADA HILLS, Calif. — Dylakor has announced Release 7.5 of DYL-260, a fixed-form report writer and utility for users of IBM 360, 370, 30 series, 4300 series and plug-compatible mainframes under OS, DOS, SSX or CMS.

The release reportedly offers an increase in the allowable number of program statements and reduces the time required to compile, while expanding the size of the compiler work area, a spokeswoman said.

Standard features include multiple reports, automatic cycle, copy feature, internal sort, data selection and handling, arithmetic and formula calculation, bit-level manipulation, handling of any data type and tabling.

The yearly cost for a three-year lease is $1,680, the spokeswoman said from 17418 Chatsworth St., P.O. Box 3010, Granada Hills, Calif. 91344.

Package Gets RSTS/E Version

MONTROSE, Calif. — Mini-Computer Business Applications, Inc. has announced that its Distribution System, a set of integrated on-line accounting packages, can now be used on Digital Equipment Corp. RSTS/E systems.

Originally designed for use with DEC systems running under the RT-11 operating system, the Distribution System package includes customer order processing, accounts receivable, fixed assets and depreciation, purchase order and receiving, general ledger, inventory management, accounts payable and payroll modules, the vendor said.

The vendor's Material Processor and Job Costing packages, which also interface with the Distribution System, are available on RSTS.

The RSTS versions of the software cost between $2,500 and $4,000 for a single processor, the vendor said from 2441 Honolulu Ave., Montrose, Calif. 91020.

'Convert' Out for DEC Ascii, IBM Ebcdic

EDISON, N.J. — Edison Software Systems has announced a package for the exchange of tapes between the Digital Equipment Corp. Ascii and IBM Ebcdic environments.

Called Convert, the nonprivileged package can be called from a program or invoked from a terminal to process a tape with a single command line, a spokesman said. It can process tapes with standard IBM labels or nonlabels.

Capabilities include performing volume serial verification for IBM standard labeled tapes, handling all blocking and unblocking internally, optionally dropping trailing blanks on each record during read operation and converting DECtabs to multiple spaces on output, allowing use of high-speed IBM printers.

Users can choose tape density for input and output in all IBM and DEC densities, the vendor spokesman said.

The purchase price for Convert is $8,500 from Edison Software at 190 Lincoln Highway, Edison, N.J. 08820.

VAX RPG Compiler Unveiled

RICHMOND, Va. — Data Management Systems, Inc. has introduced a native-mode Digital Equipment Corp. VAX RPG compiler.

Compatible with DEC PDP-11 and IBM batch programs, the compiler reportedly gives DEC users the ability to run their PDP-11 RPG programs on VAX in the native mode. It also provides an upgrade to the 32-bit architecture of VAX.

Because the compiler is compatible with IBM System/32, 34 and 3, the compiler provides an upgrade option for IBM users and enables them to upgrade to a DEC system without sacrificing their investment in IBM batch programs, the vendor claimed.

The end-user single-use license fee is $9,500. The license fee includes a one-year warranty that entitles the user to full support and updates to new versions. The price of a full-support contract after the warranty expires is $950/year. The vendor is located at Suite 202, 2922 Hathaway Road, Richmond, Va. 23225.

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Wang VS Family Gets Cobol Package Update

MONTROSE, Calif. — Mini-Computer Business Applications, Inc. (MCBA) has announced Release 3 of its accounts receivable Cobol package for the Wang Laboratories, Inc. VS family of computers.

The package is an interactive, open item and balance forward package with multiuser and multicompany capability, a spokeswoman said.

Wang accounts receivable automatically posts sales tax to up to three user-defined general ledger account numbers, the spokeswoman said. The new release features expanded fields for general ledger account number, customer credit limit, account balance, discount percentage, a sales commission amount and maximum invoice amount.

Credit history data is maintained for each customer. Customers can be flagged as to credit status, according to the spokeswoman.

A new 30-character comment can be entered for each customer to print on reports and display in customer account inquiry, the spokeswoman added.

A source code license for an MCBA Wang account package is $3,000 for a single CPU from MCBA, which is located at 2441 Honolulu Ave., Montrose, Calif. 91020.

Controls Outside Operations

'Epics' Targets 'Mapics' Users

NEEDHAM, Mass. — Marcam Data Systems Corp has unveiled a software system that reportedly allows IBM Manufacturing, Accounting and Production Information Control System (Mapics) users to control manufacturing operations performed by the vendor.

The External Production Information Control System (Epics) works with Mapics to provide detailed control over outside operations. The system permits the entry of a purchase order for each manufacturing operation and creates new inventory transactions to issue material to a purchase order, move it to the vendor and transfer material directly from vendor to vendor, a spokesman said.

Epics runs on the IBM System/34 and System/38 and interfaces with any or all of the following Mapics modules — Product Data Management, Inventory Management and Production Control and Costing, the vendor said.

Epics carries a one-time license fee of $3,900. More information is available from the vendor at 123 Highland Ave., Needham, Mass. 02194.

'Fiscal' Enhancement Out

FAIRFIELD, N.J. — The Rapidata Division of National Data Corp. has announced the release of the Financial Data Management System (FDMS), an enhancement to its Fiscal financial planning and reporting language.

FDMS is accessible through any user-developed program utilizing Fortran or Fiscal and will reportedly enable users to create larger financial data bases. It allows a data base containing up to 2,000 reporting-level organizations, 2,000 consolidation-level organizations and 1,000 defined consolidation paths.

FDMS is available on Rapidata's Rapidten remote computing service, which can be reached via standard data terminals or microcomputers, the vendor said.

Costs vary according to connect time and volume, the vendor said from 20 New Dutch Lane, P.O. Box 1049, Fairfield, N.J. 07006.

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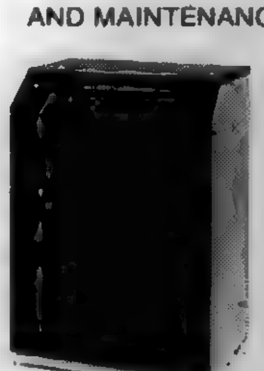

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Screen Handler Introduced For HP 3000 Processor Users

MONTREAL — Probe Software Sciences, Ltd. has announced GEN/5 Screen, a character-mode screen handler for the Hewlett-Packard Co. HP 3000 processor.

GEN/5 Screen reportedly allows the user to develop a format from a blank input screen. The package can define the screens in several parts and display each window as required, a spokesman said, allowing multiple formats on one screen. Add, store, copy, delete and modify functions are provided. The screen handler also generates the code necessary to access the screens into the working storage and procedure divisions of the programs, the spokesman said.

GEN/5 Screen is not restricted to any terminal type. The package costs $5,000 from Probe at Suite 2101, 666 Ouest Rue Sherbrooke, Montreal, Que., Canada H3A 1E7.

For PDP-11s, VAX-11s

Info Retrieval System Out

LEXINGTON, Mass. — A data base and information retrieval system for Digital Equipment Corp.'s PDP-11, VAX-11 and LSI-11 computers running RT-11 (Basic), RSX-11 and VMS has been announced by Indecs Services.

Called Isdata, the system reportedly is comprised of data search, sort and report generation functions that include summations and averages of numeric information. Reports can be printed using formats designed by the users, the company claimed. A documentation generator allows the user to document any data base on the system, according to a spokesman for the vendor.

The package costs $750 for RXO2 media and $1,000 for RLO2 media, the vendor spokesman said from 93 Outlook Drive, Lexington, Mass. 02173.

Scribe Available on Apollo Domain

CHELMSFORD, Mass. — Apollo Computer, Inc. has announced the availability of Unilogic, Ltd.'s Scribe text processing and document production system on the company's Domain Processing Systems.

Scribe is designed for producing reports, manuals, proposals, specifications and book-length manuscripts, a spokesman said. Features include merging text with graphics, producing color slides and automatically creating indexes, bibliographies and tables of contents, the spokesman continued.

Scribe links the Apollo Domain to a range of printers. The Apollo Domain can optionally drive more than 50 kinds of printing devices, the spokesman said. Scribe costs $5,000 for the first node and $1,000 for each additional node from Apollo at 15 Elizabeth Drive, Chelmsford, Mass. 01824.

Documents Tool Out for IBM 4300

DALLAS — Image Sciences, Inc. has announced application software for the electronic printing of business documents and forms.

Designed for IBM 4300 and larger mainframes, the Electronic Forms Library is an order fulfillment and distribution system for forms and documents generated from computer memory, according to a vendor spokesman.

The base price for the system is $120,000, a spokesman said from Suite 700, Campbell Centre One, 8350 N. Central Expwy., Dallas, Texas 75206.

Imlac Series II Gets Packages

NEEDHAM, Mass. — Imlac Corp. and General Electric Computer-Aided Engineering (CAE) International, Inc. have announced that four major engineering design and analysis software packages developed by Structural Dynamics Research Corp. (SDRC) support the Imlac Series II interactive graphics terminal.

The Imlac Series II terminal is an Intel Corp. 8086 microprocessor-based refresh stroke vector terminal with up to 192K bytes of random access memory for graphics storage. The four software packages it can now implement are SDRC's System Design, Geomod, Supertab and Systan.

Prices for the software start at $40,000. General Electric CAE International, Inc. is located at 300 Technecenter Drive, Milford, Ohio 45150.

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Micro Notes

A **data base manager** for North Star Computer, Inc. Northstar SOL-20/S-100 systems is available for $149.95 from Minnetonka Software, Inc. The software reportedly allows the user to create key files from the master file, selectively load them and perform data comparisons and sorts. The vendor's address is P.O. Box 392, Paramus, N.J. 07652.

Personal Computer Products, Inc. has released software said to allow the transfer of files from the Radio Shack TRS-80 Models I and III to the IBM Personal Computer. Communication programs and adapters are included. The package costs $39.95 from the vendor at Suite C-18, 1400 Coleman Ave., Santa Clara, Calif. 95050.

Individual Software, Inc. has introduced **The Instructor**, a self-teaching tutorial designed to educate first-time IBM Personal Computer users. The software focuses on the interactive aspect of the Personal Computer. Running on the Personal Computer with one diskette drive, 64K bytes of user memory and display, it costs $39.95 from the firm at 24 Spinnaker Place, Redwood City, Calif. 94065.

A farm and ranch accounting package for the Apple Computer, Inc. Apple II computer has been introduced by Harris Technical Systems, Inc. The **Agdisk Farm Accounting Package** is said to offer single-entry accounting with double-entry accuracy either on a cash or accrual basis. The software costs $600, with a $29.95 manual available from 624 Peach St., P.O. Box 80837, Lincoln, Neb. 68501.

Infostar, a data base management system that reportedly was designed for nonprogrammers, was announced by Micropro International Corp. for use on any microcomputers running under Digital Research, Inc.'s CP/M operating system. Infostar is menu-driven and, for data entry, includes a cursor that enables the user to draw forms on the screen, the vendor explained. In addition, the software is designed to enable users to generate preformatted quick reports by selecting the data desired. Infostar also includes full report-writing capabilities.

Available immediately, the complete Infostar software system includes a user training guide with example data files and other reference documentation for $495 suggested retail pricing, the vendor said from 33 San Pablo Ave., San Rafael, Calif. 94903.

An enhanced version of its **DB Master** data base file management software has been announced by Stoneware, Inc. for the IBM Personal Computer. The enhanced package was unveiled at the Comdex/Fall '82 show and, at the same time, the vendor announced that its Video Tape Training Library for Apple Computer, Inc.'s Apple II has been expanded to include the IBM Personal Computer.

The updated version of DB Master has a 3,000-char./record, whereas the Apple version permitted 1,200 char./record. The new version also makes a browse mode available so users can select specified fields for screen display from a series of data base records, the vendor noted.

DB Master for the IBM Personal Computer will be available on floppy disk during the first quarter of 1983. It is priced at $499 and requires an IBM Personal Computer with at least 192K bytes of random-access memory and two 320K-byte double-sided disk drives. A printer is recommended, the vendor said from 50 Belvedere St., San Rafael, Calif. 94901.

Systemathica Consulting Group Ltd. has announced a series of **operating system extensions (OSX)** for the Hewlett-Packard Series 80 personal computers utilizing the plug-in HP82900 CP/M module containing an additional 64K bytes of random-access memory (RAM) and a Zilog, Inc. Z-80 microprocessor. The extensions are modular software products, which the company said are fully compatible with the original HP CP/M system software (from Digital Research, Inc.) and require no modification to applications programs.

OSX-1 is an implementation of CP/M; OSX-2 contains an extended operating system which recognizes a fictitious drive that is actually a large RAM bank; and OSX-3 is a modified implementation of CP/M that provides access to more than 64K bytes of RAM, the company claimed. OSX-4 allows CP/M to issue tasks to the Series 80 CPU that are processed in parallel, while execution continues on the Z80 CPU which is dedicated to CP/M. OSX-5 parallel processing system software configures the Z80 CPU and its 64K-byte RAM as an intelligent disk I/O co-processor. OSX-7 is an overlay management package for use in conjunction with OSX-2.

The company also announced three **system monitors**. Sysm-1 reportedly provides access to every byte of the system memory or of the disk subsystem. Sysm-2, which requires Sysm-1, is a native binary code disassembler. Sysm-3, which requires both Sysm-1 and Sysm-2, is a dynamic debugging tool.

Each module costs $100 from Systemathica at 4732 Wallingford St., Pittsburgh, Pa. 15213.

Softech Microsystems, Inc. has announced **Ksam**, a keyed sequential access method for microcomputer systems; **Edvance**, an advanced system editor, and **Print Spooler**, which allows text files to be printed while the main processing task continues. All packages run microcomputers based on the University of California at San Diego's UCSD p-system operating software.

Ksam and Edvance each cost $200 and the Print Spooler costs $50 from 16885 W. Bernardo Drive, San Diego, Calif. 92127.

A menu-driven utility for the IBM Personal Computer user has been announced by Richard Waikel of Fort Wayne, Ind. **Help** is said to prompt the user for DOS commands and parameters, edit responses and pass them to DOS for immediate execution. Help requires a Personal Computer with one diskette drive, 64K bytes of memory, any monitor and IBM DOS. Help costs $19.95 from Waikel at 743 Walnut St., Fort Wayne, Ind. 46804.

A relational data base management system for the IBM Personal Computer is available from GMS Systems, Inc. **Powerbase** features Datazoom, which reportedly allows users to "explode information up to 16 levels deep." The user must have a Personal Computer with at least 128K bytes of random-access memory, PC DOS, two disk drives storing at least 160K bytes each (or the hard disk equivalent), a cursor-addressable terminal and a printer capable of an 80-col. width. Powerbase costs $475 from 12 W. 37th St., New York, N.Y. 10018.

R2E of America, Inc. has announced its marketing rights to Mark Williams Co.'s **Coherent microcomputer operating system**, with R2E's Micral 90 16-bit microcomputer series. This Unix-like operating system reportedly supports program development, application problem solving, transaction management and real-time systems. It costs $1000, an R2E spokesman said from 2545 W. County Road C, St. Paul, Minn. 55113.

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Local Data Cuts Converter Price

TORRANCE, Calif. — A 25% drop in the price of Datalynx/3270 protocol converters has been announced by Local Data Co.

The Datalynx/3270 is an interactive IBM 3276-2 Binary Synchronous Communications emulator that supports two asynchronous Ascii CRT terminals or a CRT terminal and a printer. The protocol convertor allows dumb terminals to emulate the IBM 3278-2.

Originally $1,950, the converter is now available for $1,450 from Suite 706, 2701 Toledo St., Torrence, Calif, 90503.

DPers Will Take Control Of Info Nets: Satellite Exec

By Bob Johnson

CW New York Bureau

NEW YORK — DP managers will win the battle for control over corporate data and information communications, according to a satellite company executive here.

Herman I. Kotler, chief operating officer of United States Satellite Systems, Inc. (USSSI), said in a recent interview that because American companies now place such value on the management and communication of information, high-level infighting for communications control is currently taking place between traditional "telephony-type" people and DPers.

The communications executive, formerly a marketing manager for Honeywell International, said that his DP experience tells him that DP managers will ultimately win out over the telephony types because those in control must know not only communications, but data bases, local-area networking, on-line processing and time-sharing applications.

"Both of these groups are now positioning themselves for communications control. However, DPers already know a great deal of the necessary technology for successful information communications," he said.

Kotler noted that although DPers are strong in the area of DP communications, companies will require communications to handle more than just data transmissions, meaning DP managers must be aware of those needs as well. He said information, or what he prefers to call "intelligence," will be a combination of types of information. "DPers will have to know the concepts of transmitting voice and video as well as data," he said.

A primary method of communicating this intelligence will be private corporate networks. The executive said communications DPers will be faced with private corporate communications networks, which will be owned by companies as fixed assets.

(Continued on Page 54)

Package Aids File Transfer

IBM Micro Gets Network Link

WOODLAND HILLS, Calif. — Protocol Computers, Inc. has introduced a software package that reportedly permits the transfer of files between an IBM Personal Computer diskette and an IBM Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) mainframe.

The PC 7887+ allows files from an IBM host routed to the Personal Computer to be stored in the micro in either printer format or a continuous data stream. The Personal Computer can go back to the host for more information as needed, a vendor spokesman said.

The company has also introduced two Ascii-compatible CRT terminals — the PCI 78 and PCI 51. Both models feature detachable keyboards, tilt and swivel displays and auxiliary printer ports.

The file transfer software is available for $200 and each Ascii terminal is available for $995. More information is available from Protocol Computers, Inc., 6150 Canoga Ave., No. 100, Woodland Hills, Calif. 91367.

Color Terminal Emulates 3279-2A

SAN DIEGO — Term-Tronics, Inc. (TTI) has introduced a color CRT terminal said to emulate the IBM 3279-2A terminal and which is available for both stand-alone and cluster applications.

The Model 3270-9A/B also emulates the Lear Siegler, Inc. ADM-3A or a Digital Equipment Corp. VT100 terminal. It communicates simultaneously with an IBM and an asynchronous host via separate communications ports and screen buffers, according to the vendor.

The company has also introduced a 12-port Binary Synchronous Communications (BSC) controller. It is said to support up to 12 TTI 3270-A/B multiprotocol display stations and 12 separately addressable Ascii printers which emulate the IBM 3287.

The display station is available for $3,495, the controller for $2,995 from Term-Tronics, Inc., 7408 Trade St., San Diego, Calif. 92121.

X.25 Net Interface Processor Out

VIENNA, Va. — GTE Telenet Communications Corp. has unveiled a small-scale X.25 network interface processor for access to public or dedicated packet-switched networks.

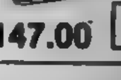
Called the TP3005, the unit is designed as an economical concentrator for four asynchronous terminal or host computer connections, the vendor indicated.

The TP3005 supports CCITT international recommendations for asynchronous terminals, (X.3, X.28, X.29) as well as Telenet enhanced parameters, according to a vendor spokesman.

The TP3005 is fully supported by the company's network control facilities. Capabilities include remote configuration, down-line loading, alarm reporting, remote diagnostics and accounting information on a port-by-port basis, according to the vendor.

The purchase price of the TP3005 is $2,350 and includes a three-year software license. A maintenance agreement covering hardware and software is available at $40/mo, and Telenet network control center support at $60/mo.

Further information can be obtained from any GTE Telenet marketing office or from GTE Telenet corporate headquarters, located at 8229 Boone Blvd., Vienna, Va. 22180.



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Package Helps Micro Emulate CPU Terminal

MORRIS PLAINS, N.J. — Monroe Systems for Business has introduced communications software that reportedly enables its personal microcomputer to emulate a mainframe terminal.

The 3270 Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) was designed especially for the Monroe OC 8820 occupational computer and includes a BIS-3270 Binary Synchronous Communications emulator that acts as an IBM 3271 controller with a 3277 terminal, a 3274 controller with a 3278 terminal or a 3275 or 3276 controller, according to a vendor spokesman.

Monroe communications packages operate at data rates up to 19.2K bit/sec with common carrier leased or switched telecommunications facilities for maximum efficiency. The communications series will be available in two versions, one based on Monroe's own operating system and the other based on Digital Research Inc.'s CP/M operating system, added the spokesman.

The 3270-SNA/SDLC will be priced between $900 and $1,200. More information is available from Monroe Systems for Business, based at The American Road, Morris Plains, N.J. 07950.

Console Provides E-Mail, Voice

FORT COLLINS, Colo. — Basic Telecommunications Corp. has introduced a communications workstation said to provide electronic mail, telephone, voice mail and a compact desktop console.

Datavoice reportedly allows the user to send and receive messages at any time; to review jointly data during a telephone conversation with remote offices; to retrieve information from host computers or data bases; to compose, edit and print memos and reports; and to dial phone calls automatically.

The price for the Model 10 version of Datavoice is $2,150; for the Model 20, $2,495. Basic Telecommunications Corp. is located at 4414 E. Hamony Road, Fort Collins, Colo. 80525.

Modem Announced

PHOENIX — Omnitec Data, Inc. has announced an autodial, full-duplex modem. The 8212 features a stored number directory of up to 10 numbers, automatic redial of last number called, speed dialing from memory, complete local and remote diagnostics and user-programmable hang-up code. The Model 8212 has an intelligent interface on the data terminal equipment side with autodial capability and operates in the answer mode for unattended operation, the vendor said.

Priced at $650, the modem is available from the vendor at 2405 S. 20th St., Phoenix, Ariz. 85034.

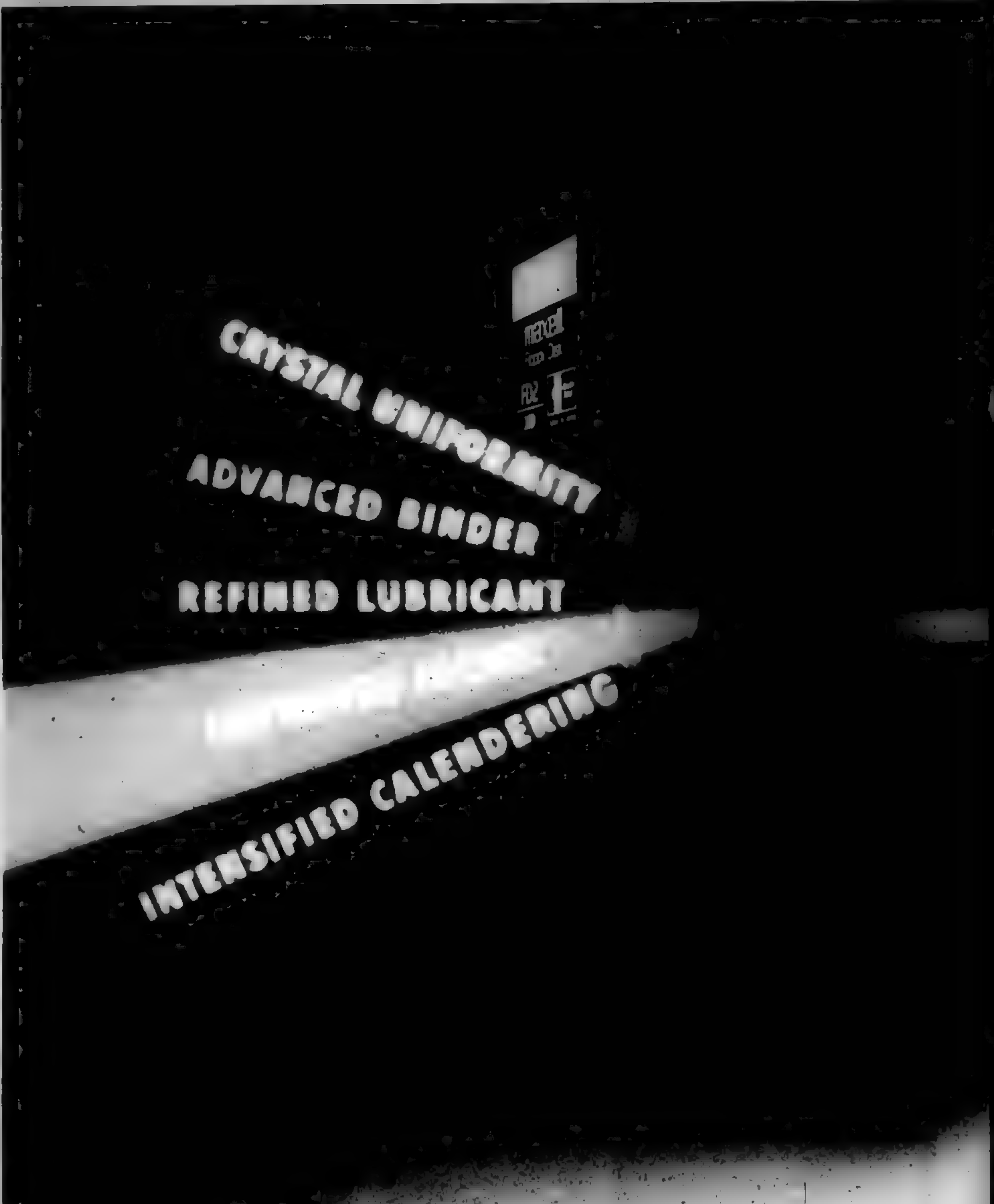
Banks Gain Interface

LITTLE ROCK, Ark. — Arkansas Systems, Inc. has announced the Switch Monitor to interface banks using the IBM System/34 computer to on-line automatic teller machine (ATM) networks.

Switch Monitor includes customization of software to the user's application files whether the files are generated in-house or from a remote processor, a company spokesman said.

The firm also supplies software for direct attachment of ATMs to System/34s. Neither product requires an intermediate computer for the interface, the vendor claimed.

Switch Monitor is priced at $11,000 and is available from Arkansas Systems, Inc. at Suite 202, 8901 Kanis Road, Little Rock, Ark. 72205.



Z80 Users Get Accelerator

Bridge Users Get Phonelink

BERKELEY, Calif. — Virtual Microsystems, Inc. has announced Phonelink, a utility for The Bridge, the firm's virtual CP/M package for Digital Equipment Corp. minicomputers.

Phonelink facilitates use of microcomputers as part of a larger virtual system. Users can build and edit programs and files locally and transmit them over RS-232 lines to and from their DEC systems, according to a spokesman for the vendor.

The package costs between $750 and $1,250, depending on the DEC processor configuration, according to a spokesman for the vendor.

The firm also announced a hardware accelerator, the Z-Board, which incorporates up to four Zilog, Inc. Z80 microprocessors, up to 256K bytes of random-access memory and a bit slice state machine.

The unit costs between $1,250 and $1,780, depending on the DEC processor configuration.

Virtual Microsystems is located at Suite 720, 2150 Shattuck Ave., Berkeley, Calif. 94704.

Processor Emulates IBM BSC Controller

MIAMI — Innovative Electronics, Inc. has introduced a stand-alone, self-powered, micro communications processor said to allow full emulation of the IBM 3277/3278 Information Display Systems using a Televideo, Inc. 920, 925 or 950 terminal.

The unit communicates to an IBM host using 3270 Binary Synchronous Communications (BSC) protocol. It emulates an IBM BSC controller with one or two ports available for any combination of display stations or printers, a vendor spokesman claimed.

Other capabilities include replacing or multidropping with IBM 3271 Models 1 and 2, IBM 3276 Models 1 and 2 or IBM 3274 Model 51C control units, according to the vendor.

One BSC port and CRT terminal or printer port is available for $1,495. The two-port configuration is available for $1,695, plus an additional $300 for the modem sharing option, the spokesman said.

Innovative Electronics, Inc. is located at 4714 N.W. 165th St., Miami, Fla. 33014.

Miniprinter Announced

SUNNYVALE, Calif. — An intelligent, microprocessor-based telecommunications miniprinter has been announced by Advanced Communications, Inc.

The MP 2000, a 20-col. thermal printer, features an integral Bell 103 Ascii modem Frequency Shift Keying modem for communications over any dial-up phone line. The modem operates at a rate of 300 bit/sec, a vendor spokesman said. Unattended, automatic answering on the first or fourth ring allows incoming messages to be printed at 30 char./sec, 24 hours a day, the vendor said. The Federal Communications Commission registered printer plugs into any standard RJ11 telephone jack and does not require special installations.

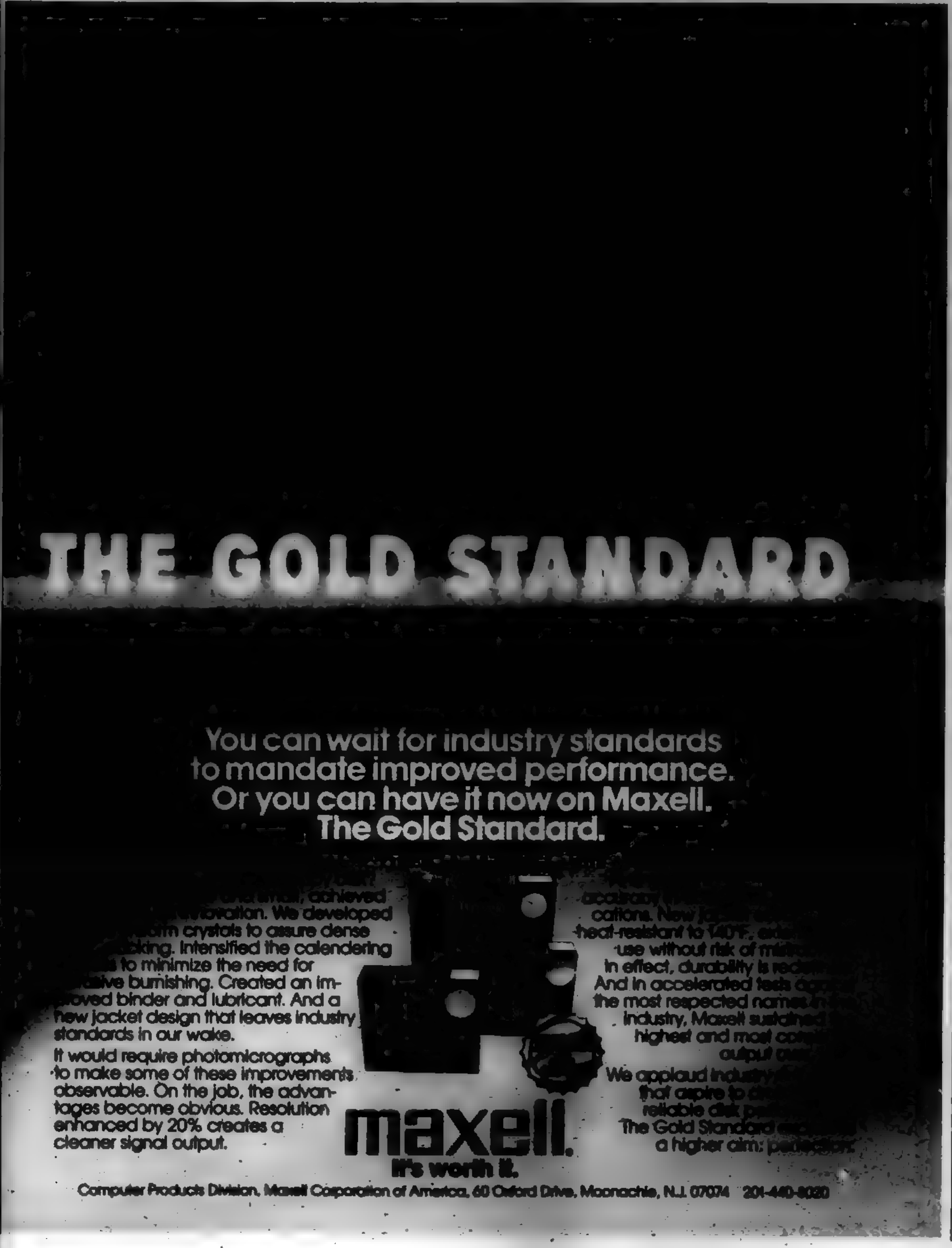
The MP 2000 is priced at $445, Advanced Communications said from 462 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Series 500 Gets Control System

MAYNARD, Mass. — Data Terminal Systems, Inc. has announced the addition of an inventory control system to its Series 500 family of point-of-sale terminals.

The Model 555 is said to offer gross margin, reorder and on-hand and physical inventory reporting for up to 12,000 items. The system reportedly is compatible with Universal Product Code and optical character recognition scanning equipment.

Base price of the Model 555 is $3,395 from 124 Acton St., Maynard, Mass. 01754.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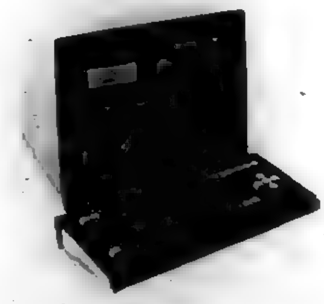
Terminal Allows Users To Reconfigure System

ANN ARBOR, Mich. — Ann Arbor Terminals has introduced a CRT terminal that allows users to reconfigure the system for different software, I/O systems and applications.

The Genie + Plus display terminal can be changed from a conventional 24- by 80-char. mode unit to a 30-line terminal with multiple page and window capability, to a highly structured, off-line form-filling terminal with protect, guard, numeric, justify and security areas, a vendor spokesman claimed.

The terminal is available for $1,395 from Ann Arbor Terminals, Inc., 6175 Jackson Road, Ann Arbor, Mich. 48103.



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Satellite Exec: DPers in Charge

(Continued from Page 51)

"Every Fortune 500 company with communications needs of over 500 miles will eventually own their own communications capabilities," Kotler observed. "Corporations want to own their own networks as assets because many spend an average of 2% to 4% of their revenues on communications. It is much more desirable to have a network as a fixed cost so concrete plans for growth can be made."

Central Satellites

Kotler sees the satellite as central to this kind of network. "The satellite is to the computer industry today what the jet engine was to the airlines some years ago," he said. He explained that the satellite offers companies the fastest and safest method of communication and can be cost-effective as well. "Corporations can send their combined types of information to the satellite and have it beamed quickly to a private earth station near their facilities. The need for long land lines is cut out and much of the reliability problems are eliminated," he stated.

Until now, satellites have been primarily used for telephone and entertainment capabilities because of the high cost of owning a transponder, the part of the satellite system which switches communications signals. Kotler said that his company will be supplying fractional transponder space to companies, making it financially feasible for them to operate their own communications networks.

USSSI has taken the first step in offering these capabilities through what Kotler calls an "information distribution utility." He referred to the recent joint marketing/technological exchange agreement made with Wang Laboratories, Inc., [CW, Dec. 13] that will allow Wang accounts to participate in their own national communications network of Wang-based systems with voice, data, video and text transmission as the beginning of such a distribution utility.

Kotler said USSSI will launch its high-frequency Ku-band USAT-1 satellite in November 1985, and USAT-2 in June 1986. The company will also offer communications facilities management and consulting services to firms that require them, he concluded.

MPC Announces Smart Terminal Line

STERLING, Va. — Micro Products Co. (MPC) has introduced a series of smart editing CRT terminals said to feature ergonomic design, enhanced video attributes and flexible screen formats.

The MPC 1100 reportedly emulates the Perkin-Elmer Corp. 1251 and costs $1,695; the MPC 1200/1250 series is said to deliver full functionality of the Digital Equipment Corp. VT131, VT132 and VT125 series and costs between $1,795 and $3,495.

The MPC 2100/2150 series is an advanced color terminal for graphics and alphanumeric editing and costs between $2,995 and $4,395, the vendor spokesman said.

All of the terminals feature an expanded 14-in. nonglare screen in a housing that tilts 15 degrees and swivels 60 degrees. A detachable low-profile keyboard controls such characteristics as display brightness and color, the vendor said.

More information can be obtained by contacting Micro Products, through P.O. Box 198, Rt. 634 and Acacia Lane, Sterling, Va. 22170.

Graphics Terminal Announced by HP

PALO ALTO, Calif. — Hewlett-Packard Co. has introduced a color graphics terminal said to offer vector graphics and complete alphanumeric capabilities.

The HP 2627A is designed for business and technical graphics such as presentation graphics and data analysis. The terminal's 12-in. screen has a nonglare, high-contrast display with a graphics resolution of 512 by 390 pixels.

It is a raster terminal with eight basic colors. The colors can be mixed to create additional colors, some of which have been redefined to HP's plotter pen colors, a vendor spokesman said.

The terminal is available for $5,975 from Hewlett-Packard, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Apple II Gets Line Monitor

MINNEAPOLIS — Metatek, Inc. has announced a low-cost data line monitor designed to operate on an Apple Computer, Inc. Apple II personal computer system.

Metascope consists of a printed circuit board, documentation and all software necessary to turn an Apple II computer into a fully programmable data line monitor, the vendor said. The unit is capable of displaying and storing data in asynchronous, byte-oriented synchronous or bit-oriented synchronous High-level Data Link Control/Synchronous Data Link Control modes at speeds to 19.2K bit/sec.

Other features include the ability to start data recording based on a trigger pattern match, storage of data on diskette and a programmable host emulation mode that allows the Apple II to act as a sophisticated communications controller.

The retail price for Metascope is $895. Sales and distribution are being handled by Parity Products, 3900 Crestview Drive, Minneapolis, Minn. 55331.

Gets DEC DMF-32 Capability

CS11, CS21 Mux Series Enhanced

SANTA ANA, Calif. — Emulex Corp. has introduced enhancements to its CS11 series and CS21 series of communications multiplexers. The enhancements are said to offer the multiplexers the capabilities of the Digital Equipment Corp. multifunction I/O controller called DMF-32.

The enhancements, called the CS11/F and the CS21/F, are said to be fully software transparent and to operate in the DEC VAX-11 environment with the VMS 3.0 or higher version operating system.

DMF-32 capability offers eight asynchronous lines, one synchronous line and one parallel I/O port. Only two of the eight asynchronous lines need modem control for remote telecommunications.

A 16-line CS11/F lists for $4,500 and a 16-line CS21/F lists for $3,500 and are available from Emulex Corp., 2001 E. Deere Ave., Santa Ana, Calif. 92705.

Interface Out For TI Series

DALLAS — Texas Instruments, Inc. has introduced an asynchronous interface designed to attach printers, terminals or modems to its Business System Series 600 or 800 computers.

The Communications Interface 402 is said to provide an interface to two 9,600 bit/sec a[illegible]ronous devices compa[illegible]e with RS-232C or V.24 protocols. The CI402 is said to replace a single-channel TTY/EIA card. Compatible interfaces include the TI Series 300 two-channel interface, the Series 300 processor port and the Series 600 processor port.

The interface is available for $495 from Texas Instruments, Inc., P.O. Box 202146, Att: H-641, Dallas, Texas 75220.

Smartbuffer Introduced

DORAVILLE, Ga. — Data-Match Corp. has introduced a buffer unit said to support up to four inputs and four outputs at the same time.

The Smartbuffer allows several computers to transmit data to shared outputs. It has an expandable internal memory of up to 256K bytes.

It will also allow users to print general ledger, monthly reports and 20-page manuscripts while leaving the computer free for other projects. It can store up to 10 pages and transmit to a printer at 200 to 400 word/min.

The buffer ranges in price from $335 to $1,100 and is available from Data-Match Corp., 3810 Oakcliff Industrial Court, Doraville, Ga. 30340.

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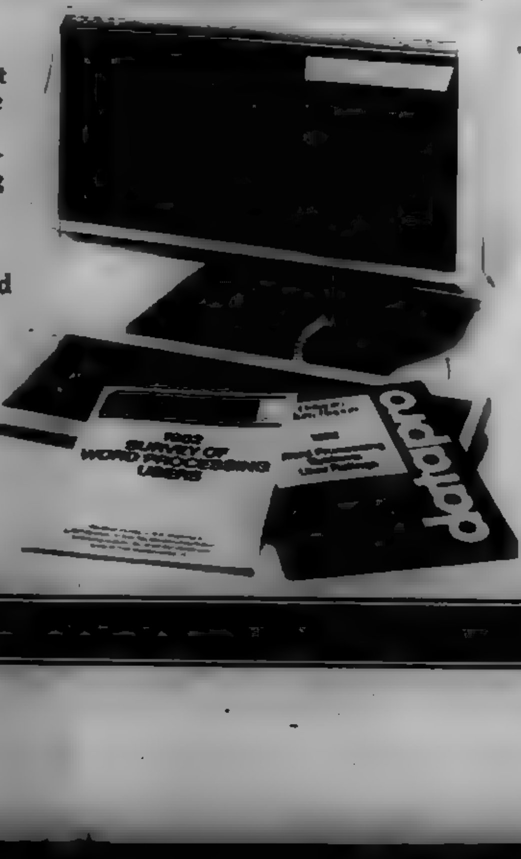

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Graphics Package Out for VT-100s

SACRAMENTO, Calif. — Digital Engineering, Inc. has introduced a graphics conversion package for the Digital Equipment Corp. VT-100 family of terminals.

Designed and programmed with 32K bytes of local software, the DQ650-series "Gen.11 Retro-Graphics" enhancement provides bit-mapped imaging and emulation of the Tektronix, Inc. 4010 graphics terminal and monochromatic emulation of the graphics functions of the Tektronics 4027 color graphics terminals, the vendor said. It also emulates the graphics functions of the Tektronics 4014.

A version of the software with 800 by 480 pixel resolution — the DQ650M series — is also available.

The DQ650 costs $1,230 and the DQ650M package ranges in price from $1,560 to $1,715.

Digital Engineering, Inc. is located at 630 Bercut Drive, Sacramento, Calif. 95814.

Graphics Support Units Unveiled

MOUNTAIN VIEW, Calif. — Kaufman Research Manufacturing, Inc. has introduced a graphics support feature said to provide support of asynchronous graphics terminals running on IBM and Sperry Univac systems.

Designated 870G and 871G respectively, the protocol converters are both polled concentrators and terminal emulators. Up to eight terminals may be attached to each unit, a vendor spokesman said. Line speeds of up to 19.2K bit/sec are reportedly supported.

The systems feature support of both black-and-white and color graphics while retaining compatibility via the emulation of the IBM 3270 and Univac UTS 40 series of terminals.

The price of the graphics support ranges from $8,000 to $10,000 for either the IBM or Univac versions, depending on the number of ports.

Kaufman Research Manufacturing, Inc. is located at 145 E. Dana, Mountain View, Calif. 94041.

DMG/Net Gains Interface for DEC

WILLOWDALE, Ont. — Digital Management Group Ltd. has announced that DMG/NET networking software for Digital Equipment Corp. PDP-11 RSTS/E systems now interfaces with Racal-Vadic, Inc. and Ven-Tel, Inc. autodial units.

In a typical DMG/NET configuration, an autodial modem is connected to a DEC computer terminal port. The software is configured for all required destinations and the user can access any destination by typing a short abbreviation at the terminal. DMG/NET establishes the connection to the remote computer, and if the main number is busy, it will automatically seek alternatives, the vendor said.

Prices for the software start at $1,500 from Digital Management Group Ltd., located at 4800 Yonge St., Willowdale, Ont., Canada M2N 6G5.

SBSB Introduces Worldwide Net

WORCESTER, Mass. — A World-Wide Computer Network from Small Business Service Bureau, Inc. (SBSB) reportedly allows small-business personnel to send and receive information, data, electronic mail and computer programs.

Available to all 35,000 SBSB members, the network serves cottage industries, self-employed business professionals, sales agents or any small-business member company.

Game computers, terminals or business computers can "talk" through the network 24 hours a day to most U.S. locations and many locations throughout the world. Users must have SBSB membership, which costs $50/year. There is a $5/mo minimum account charge for the network, with additional costs on an as-used basis, a spokesman said.

SBSB is located at 544 Main St., P.O. Box 1441, Worcester, Mass. 01601.

Interfaces Out For DG Minis

WESTBORO, Mass. — Two interface packages meeting the IEEE-488 digital interface standard for programmable instrumentation have been announced by Data General Corp.

The packages for the DG Nova and Eclipse minicomputers include the functions of controller, talker and listener.

More than 1,000 different instruments from various vendors can be connected to the controller without special engineering, a vendor spokesman claimed. The interfaces support both programmed and data channel I/O modes.

The IEEE-488 Micronova Interface (Model 4516) is available for $1,150 and the IEEE-488 Nova/Eclipse (Model 4517) is available for $1,850, according to the vendor.

The initial license fee for each software package is $450. DG is located at 4400 Computer Drive, Westboro, Mass. 01580.

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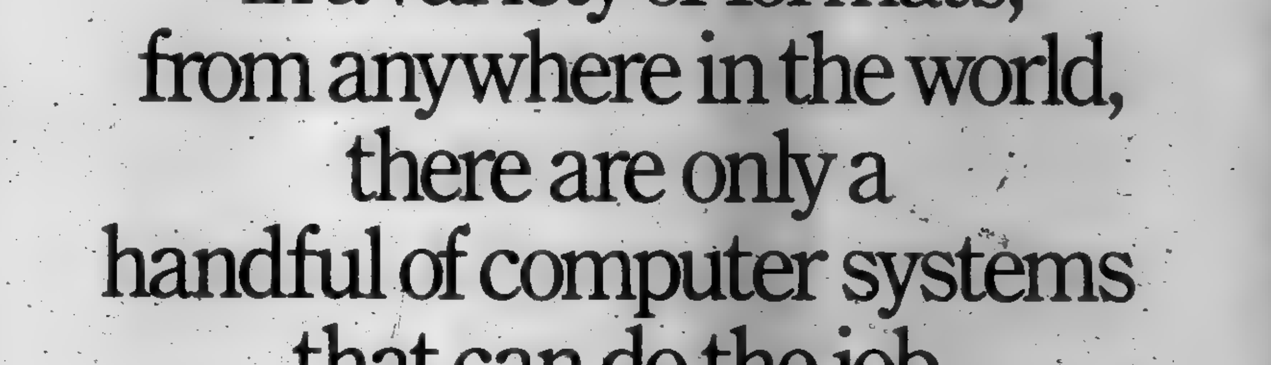


The Tandem NonStop™ Network

Components fail. But that doesn't necessarily have to mean downtime. With a NonStop network from Tandem, you're assured of completely reliable system operation—right through a component failure that would shut other systems down. The result is that you get the right information to the right people at the right time. Across the street or around the world. Without fail.

The network is based on the continuous processing capabilities of Tandem NonStop computer systems—a fault-tolerant environment in which a malfunction or component failure will not inhibit or interrupt system operation.

With a Tandem system, you can access information from anywhere in the network, in different formats (text, data and images), integrate all the information in a form that meets your specific requirements, and distribute the finished product at the appropriate times to any number of recipients at any number of locations. Those receiving the communication can 1) interactively add or delete information; 2) forward it to other individuals or send it back to the originator; 3) print it out; or 4) store it for future reference. Or any combination.

And in a Tandem network, all the advantages of NonStop system availability become NonStop network availability. If a line failure occurs, our advanced networking software transmits the message over the optimum alternative path—transparently to the user, of course. But the result is always the same: your information gets through. Without fail.

DEVELOPING THE INFORMATION

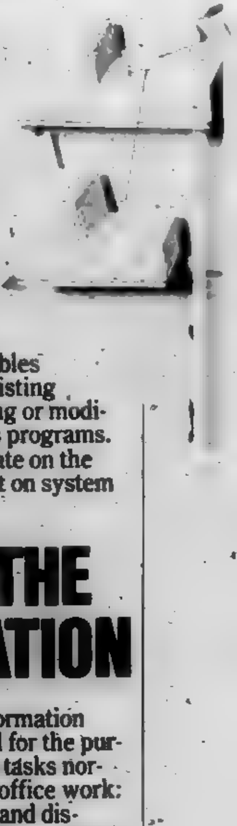
As the nature of doing business on a large scale becomes ever more complex, so does the nature of the information behind it. Not only is this information in many different formats, it is typically widely dispersed throughout an organization. With most systems, that means throughput problems for those users in remote locations who need only occasional access to it.

Not so with Tandem.

The wonders of a distributed, relational database.

Unlike other approaches to distributed processing in which each location functions as an independent database, Tandem treats the network as one single database with multiple files distributed geographically. Programs will run with files from anywhere in the system, whether you have a single two-processor system or a 255-system network. And with no user intervention or special programming required.

The key is the relational organization of the database—an extremely flexible design concept that's also extremely easy to work with. Setting up files merely involves creating or filling in tables with pertinent data. So you save time and money right from the start on program development and maintenance. And to expand, you merely add new tables or add more rows to existing ones—without rewriting or modifying your applications programs. This lets you concentrate on the application at hand, not on system organization.



MOVING THE INFORMATION

Most business information systems are configured for the purpose of automating the tasks normally associated with office work: writing, printing, filing and distributing information within a local area.

But communicating this information in a timely, reliable manner outside that area is another problem entirely. If you don't know beforehand precisely which locations are to be included in your network, you'll pay a stiff penalty in reprogramming and restructuring costs when you want to add nodes or change them around.

That's where the Tandem difference is so important.

Rings. Strings. Stars. Or any combination.

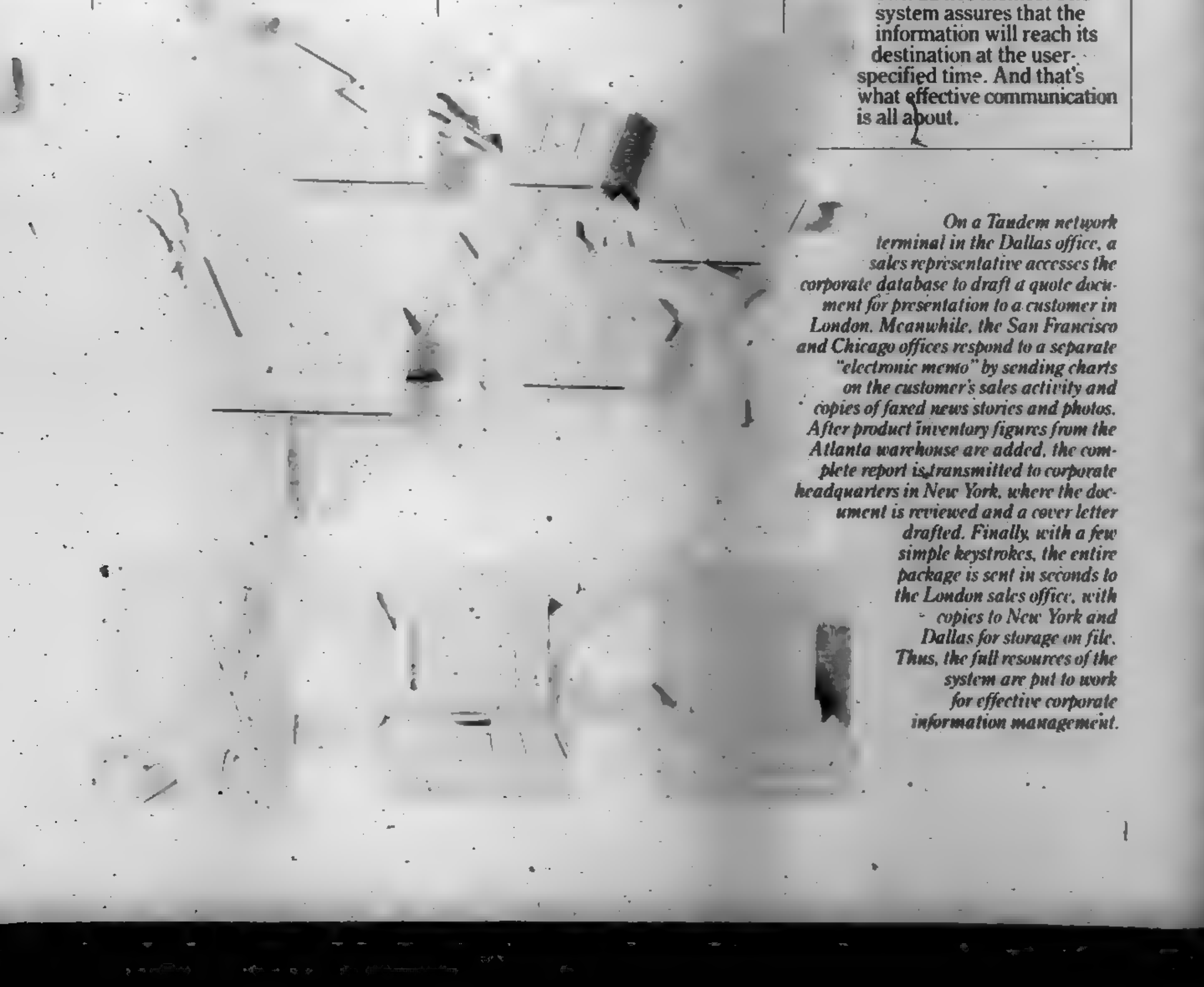
The Tandem system was designed from the start to be a single, flexible network. No matter what the configuration. Or how many times you change it. A simple two-processor system at one physical location may be thought of as a network, just as a 255-system configuration spread across the globe is a network. The very same network, at that. This concept of a *total* information/communications system results in significant time- and cost-saving benefits for the system designer. And ultimately, for the user.

Plenty of room to grow.

System expansion is easy and economical. Thanks to the network's modular construction, moving up to larger configurations is simply a matter of adding hardware, piece by piece, as requirements dictate. You start only with what you need, and add processors, peripherals and communications facilities in low-cost increments. And without having to rewrite a single line of software. That means your original investment in equipment and programs is always protected.

The right information to the right people at the right time.

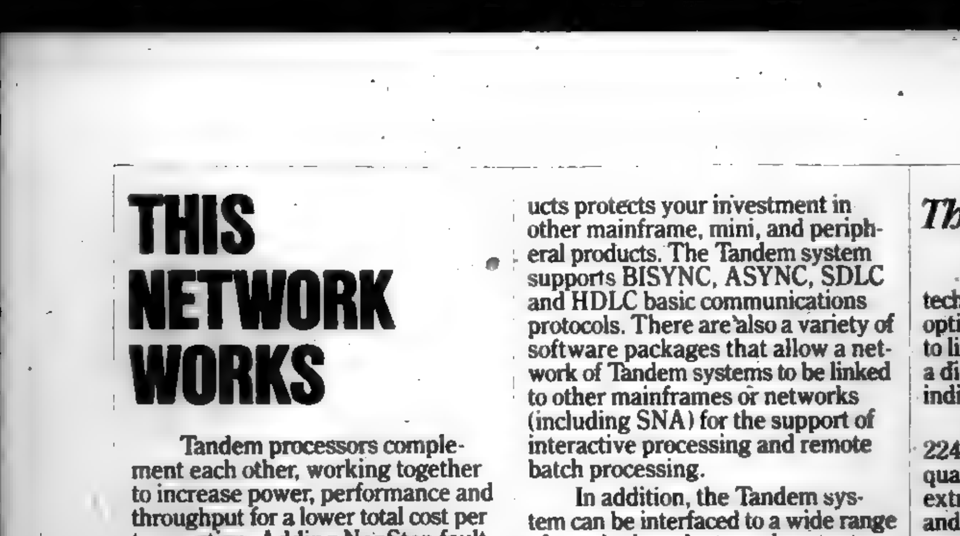
The Tandem NonStop network integrates all devices into a single virtual system. This provides a framework for information handling that is independent of both content and time. Each user can send, query, receive, store, secure, forward and distribute information at his or her own terminal. Including information from the database and images from a facsimile machine, and the user's own ad hoc memos. The system assures that the information will reach its destination at the user-specified time. And that's what effective communication is all about.



On a Tandem network terminal in the Dallas office, a sales representative accesses the corporate database to draft a quote document for presentation to a customer in London. Meanwhile, the San Francisco and Chicago offices respond to a separate "electronic memo" by sending charts on the customer's sales activity and copies of faxed news stories and photos. After product inventory figures from the Atlanta warehouse are added, the complete report is transmitted to corporate headquarters in New York, where the document is reviewed and a cover letter drafted. Finally, with a few simple keystrokes, the entire package is sent in seconds to the London sales office, with copies to New York and Dallas for storage on file. Thus, the full resources of the system are put to work for effective corporate information management.

THIS NETWORK WORKS

Tandem processors complement each other, working together to increase power, performance and throughput for a lower total cost per transaction. Adding NonStop fault-tolerant operation to advanced networking capabilities, the Tandem system virtually eliminates the risk of network failure. At the same time, it protects the database from damage caused by electronic malfunctions. And when a component does fail, the system can be serviced—parts removed and replaced—while continuing to process transactions. So your message is guaranteed to get through. On time, every time. And over the widest range of communications circuits, too: X.25 packet-switching networks, terrestrial circuits, fiber optics, even satellite links.



The ins and outs of transmitting data.

Tandem's comprehensive set of communications products protects your investment in other mainframe, mini, and peripheral products. The Tandem system supports BISYNC, ASYNC, SDLC and HDLC basic communications protocols. There are also a variety of software packages that allow a network of Tandem systems to be linked to other mainframes or networks (including SNA) for the support of interactive processing and remote batch processing.

In addition, the Tandem system can be interfaced to a wide range of terminal products such as text processors, ATMs, cash registers, badge readers, optical scanners and shop floor terminals.

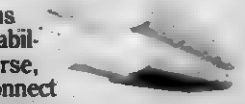
Words and images.

Tandem's special facsimile software lets you store and forward facsimile reproduction of charts, graphs and diagrams to accompany text from various data files. And, you can access this information from any telephone with a facsimile machine. What's more, this ability to transmit graphic elements also greatly enhances our unique Query/Report Writer capability—the only such software on the market that optimizes both functions over a distributed database.

The speed of light.

Using state-of-the-art optical technology, our high-speed fiber optics extension provides the means to link Tandem processors up to a distance of 1000 meters between individual systems.

In effect, you can link up to 224 processors within your headquarters or plant, giving you an extremely fast and efficient system that provides enormous processing capability. And of course, you can interconnect this system into your network for expanded information-sharing capabilities.



The sky's the limit.

The lower costs and higher reliability of transmitting data over long distances via satellite is an economical and practical alternative for any corporation with geographically dispersed locations.

That's why Tandem has joined with American Satellite Company (ASC®) in a unique marketing agreement to provide the only completely fault-tolerant satellite communications network on the market today. So you can be assured of total NonStop system reliability, from operating system to orbiting satellite.

Following the NonStop system strategy, earth stations transmit and receive data over two parallel paths—if one is down, the other is still operational.

Also, ASC provides two different transponders on the satellite itself. Again, should one be inoperative, the second transponder and data path continue to function.

ASC provides the earth stations, including a special antenna that is small and light enough for mounting on a rooftop or in a parking lot. This can be directly connected to the computer system, without need of leased lines, for lower costs and

higher dependability. Tandem supplies all other ground components, including controllers, RF modems and complete computer/communication interface modules, all of which were designed with solid state technology for outstanding reliability. And, since Tandem maintains the entire system, you always have only one number to call for the answer to any question.

Putting it all together.

With a full range of communications capabilities and the enormous capacities of a global system, the Tandem NonStop™ network is uniquely suited to the complete information requirements of multi-divisional, multi-national corporations. And most especially for any business or institution that needs to get the right information to the right people at the right time. Without fail.

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A single system.

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A single operating system.

A single database.

A single operating environment.

A single network architecture.

A single application environment.

The Tandem Evolution—our original design concept, still big enough to contain the past, handle the present and include the future.

The Tandem Evolution—an evolution in products and strategy that integrates information and communications in a single virtual NonStop system. A system with the flexibility to adapt as time, markets or economic considerations change. A reliable network that links people, equipment and data independent of location, application, form of data, method of transmission, number of users or types of equipment. An evolution that from beginning to end protects your investment in information resources.

The Tandem Evolution—a consistency in philosophy that's designed to give users the optimum in computer performance right now. While providing a continuing, flexible framework for enhanced performance tomorrow.

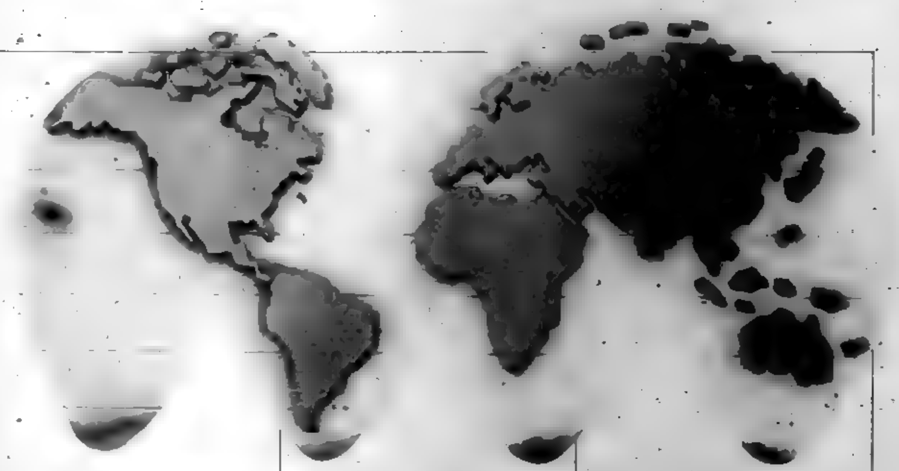
Tandem provides local sales and service support in the major computer markets throughout the free world. Plus fourteen software education centers in the U.S., Canada and Europe offering professional technical training courses for your programmers and analysts. With this kind of support behind each new capability, applications can be implemented on-line quickly, easily and economically.

If you'd like more information, call your local Tandem sales office listed on the back cover. Or contact Tandem Computers Incorporated, 19333 Vallco Parkway, Cupertino, California 95014. Toll Free 800-538-3114 or (408) 725-6000 in California.

The system shown is a sixteen processor system. It can function independently or as the local node of a 255-system network, more than 4,000 processors, providing direct and immediate access to information sources anywhere in the world.

When you need it without fail, there is only one.

TANDEM



For information on any of Tandem's computer products, contact the sales office nearest you.

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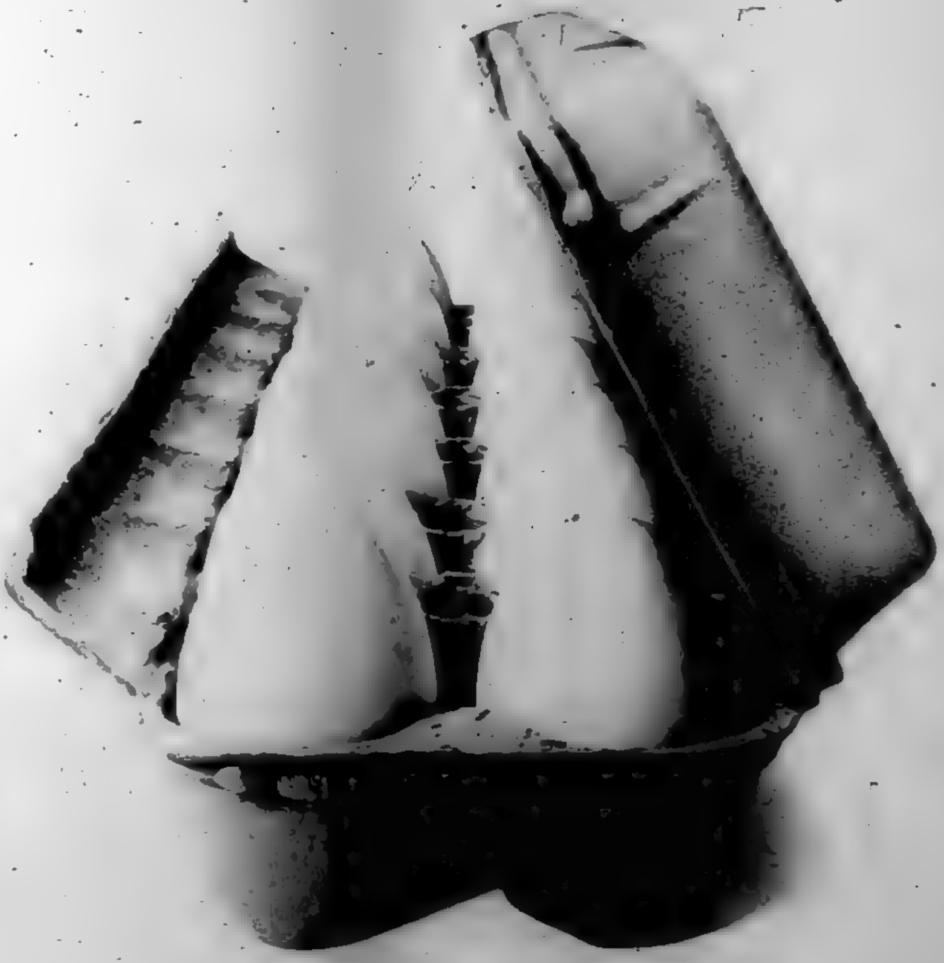

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High Technology Comes of Age in the Emerald Isle: A Firsthand Report

By Henry and Elizabeth Urrows

Who should be interested in Ireland's high-technology boom? You should, especially if you work at a multinational company. Or, if your personal aspirations and concerns go beyond immediate MIS duties, you can profit [illegible] experiences in attracting, developing and keeping highly qualified people — motivating them toward practical innovation and constantly improving hardware and software production. And, through cost-effective manufacturing practices, high-technology firms in Ireland are meeting ambitious profit objectives.

On a recent tour of Ireland's high-technology industries, we learned that the country has outworked competing nations in attracting companies that export effectively — firms that are resources for equipment and service support of what is fast becoming inexpensive, reliable internal and worldwide corporate communications.

The explosive growth of data processing and telecommunications manufacturing in the Republic of Ireland is maturing, led by U.S. companies with European and Japanese firms following rapidly. Ireland's component assembly operations of the early '70s, fortified by careful quality control and low costs,

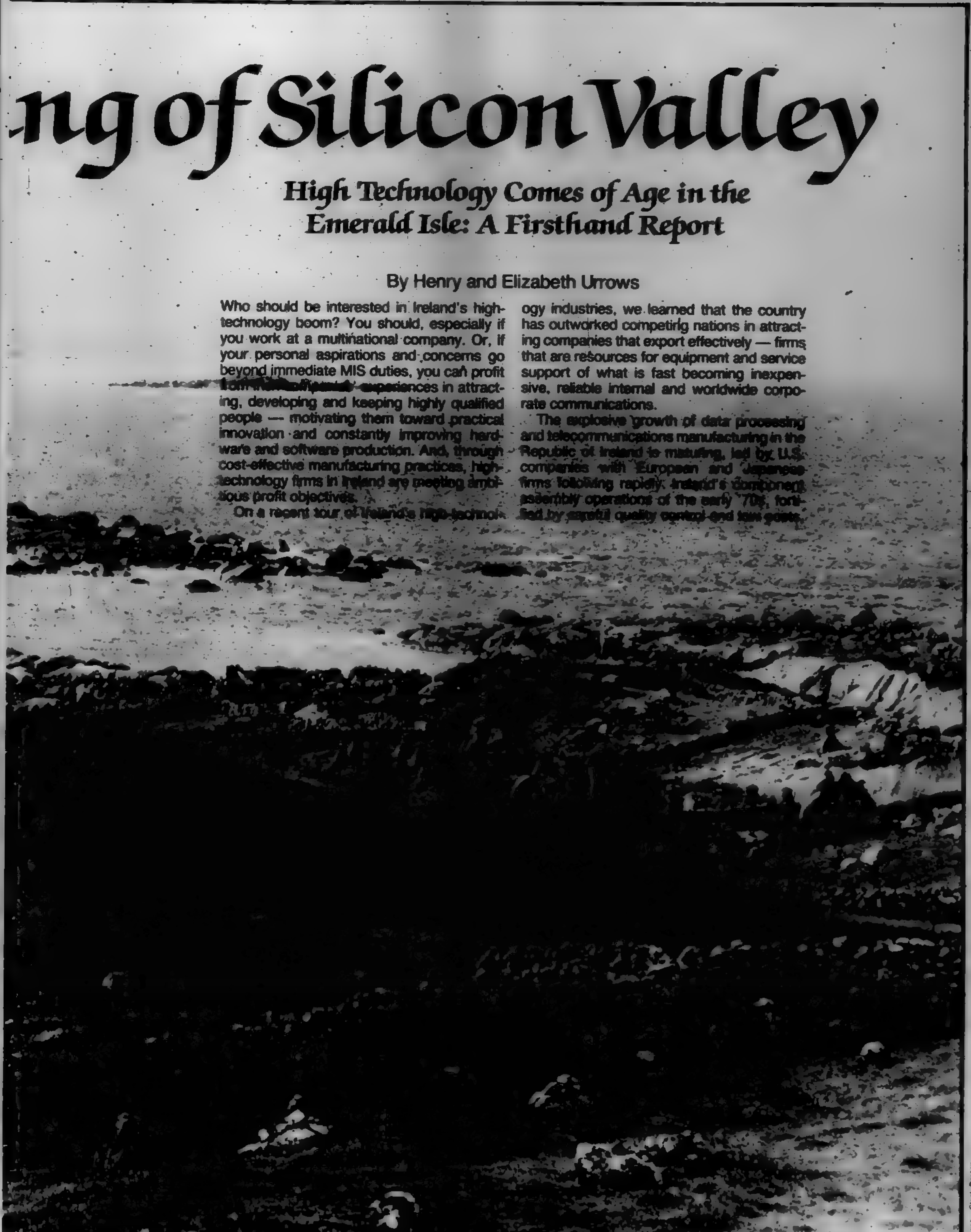


Photo by Cary Wolinsky, Stock Boston

are giving way to design and manufacture of new hardware, software and research into new applications.

New Investment

U.S. corporations have dramatically increased their investments in Ireland over the past 10 years. By one tally, they have sown about 265 industrial and commercial installations there. In the two decades from 1950 to 1970, American industries invested about $500 million in the Irish Republic. During the following 10 years, they multiplied that stake sixfold, putting in almost $3 billion more.

Ford Motor Co., General Motors Corp., Gulf & Western Industries, Inc., Ingersoll-Rand, Kollmorgen Corp., Rockwell International Corp. and Westinghouse Corp. are all in Ireland. Digital Equipment Corp. was the flagship of the U.S. computer industry in Ireland when it began operations there in 1972.

A major attraction for U.S. firms is Ireland's full membership in the European Common Market, which it has held since 1973. The country is therefore a base for duty-free access to markets where more than 260 million Europeans live, work and consume.

With 10 countries full members of the European Economic Community (EEC) and two more applications pending, why Ireland? American managements are more comfortable when dealing with English-speaking people, even though British and Irish uses of the tongue recall George Bernard Shaw's verdict that the U.S. and Britain are separated by their common language. (Our prevailing national American disinclination to master foreign languages is wastefully expensive, just as our ignorance of the Brussels Convention regulations sharply cuts the U.S. ability to export goods and services competitively.)

Ireland competes to get what we can bring to Europe. Until recently it offered a 10-year tax holiday on export profits — 100% tax relief until 1990. Its nonrepayable cash grants can be as high as 50% of the cost of fixed assets and the entire cost of training new employees, including management training in the U.S. Since Jan. 1, 1981, the Irish corporate tax rate has fallen from 45% to a new maximum tax rate of 10%. This ceiling is guaranteed to last until the year 2000.

The U.S. Department of Commerce August 1981 annual survey of U.S. investment overseas reported that between 1977 and 1980, U.S. companies obtained an annual average 33.7% rate of return on manufacturing investment in the Republic of Ireland. That was twice the rate in the then nine EEC countries (16.8%) — and more than double the world average.

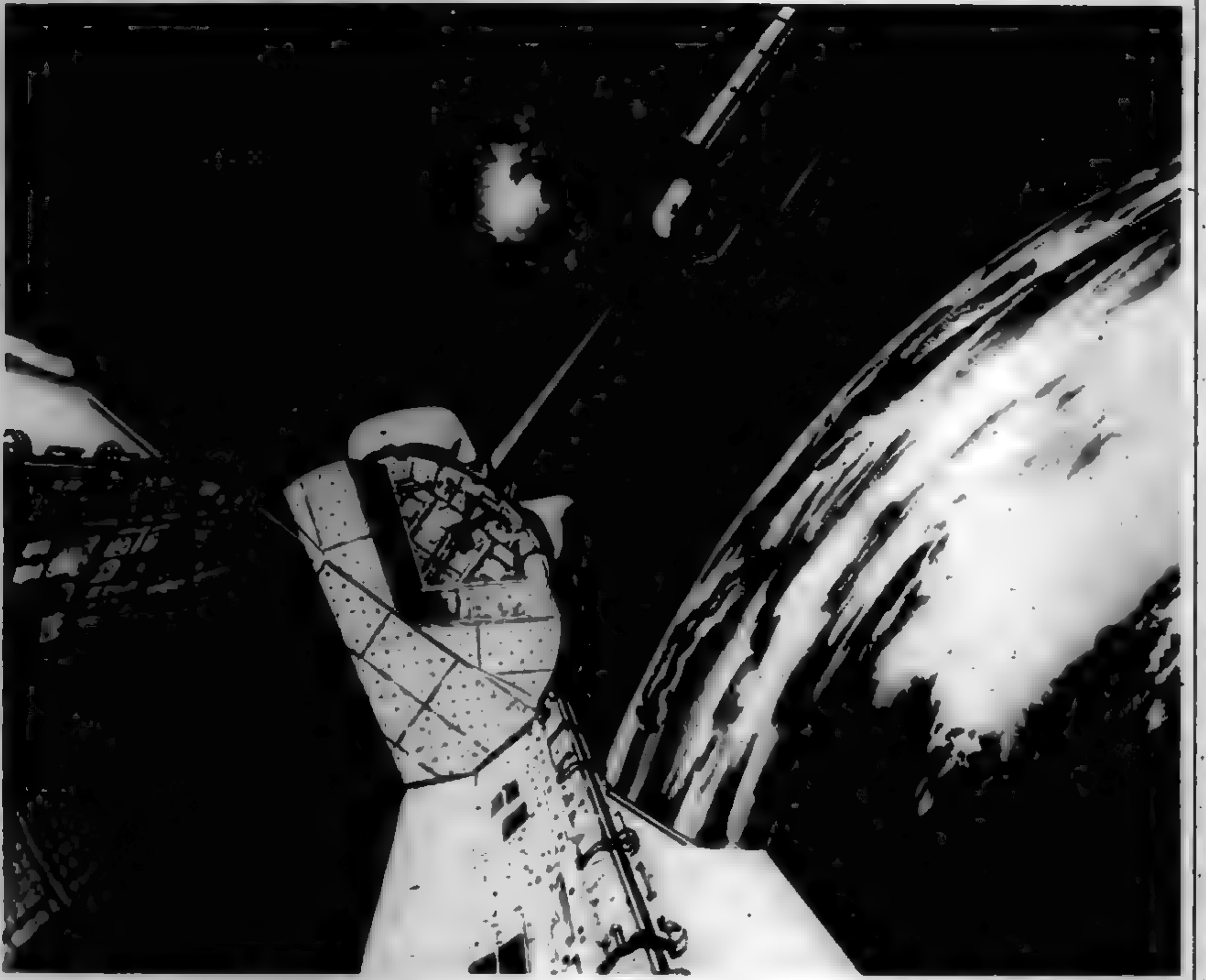
In the same four-year period, U.S. investment in Ireland grew an average of 41% each year. That was three times faster than the 13.9% EEC average.

The result has been that even though all overseas firms in Ireland have total freedom to repatriate all their profits, many have kept increasing their investment there. General Electric Co. began work at its first Irish plant in 1963, then others in 1966, 1976 and 1981. Westinghouse has produced at eight plants since 1976. DEC now has two hardware manufacturing facilities and one software plant in Ireland.

Tax Incentives

We wondered whether firms that have entered Ireland might pull out after the 10-year tax holiday on exports. Dan Coffey of Ireland's Industrial Development Authority (IDA) said the holiday only applies to companies that were in Ireland before 1981. That carrot is now supplanted by the 10% maximum tax on profits for all manufacturing to the year 2000.

"The European Economic Community and our major competitors like England, Belgium and Italy were very unhappy with us. As far as they were concerned, we were breaking the Treaty of Rome, which had created the EEC, because our attractions discouraged companies from going to their locations. When the EEC Commission took us to task," Coffey recalled, "the way they put it was that our taxation of overseas manufacturing companies discriminated



History in the making: #3 in a series, the Hughes SBS.

The Shuttle gets down to business.

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Three of the four Satellite Business Systems satellites are now in orbit. The third, launched November 11th from the Kennedy Space Center, is the first spacecraft to be carried into orbit on the NASA Space Shuttle. The first delivered telephone, teleconferencing, computer-to-computer communications, and electronic mail services to its corporate customers; the second simply expanded these communications capabilities; the third provides integrated voice, data, and video communications transmissions, and further extends the electronic mail services.

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Photo by George A. Bowen

At DEC's Clonmel site, Patricia O'Toole places an integrated circuit with guidance from a programmed laser beam.

against domestic producers serving our own market.

"The Irish government kind of outmaneuvered the EEC. It changed to a guarantee that taxation would not exceed 10% for everyone. That quieted our critics in Europe. It also made our domestic manufacturers very happy. So now we offer a maximum 10% tax, against which there are very generous depreciation allowances."

The Irish have also found ways to encourage start-ups for whom the prospect of large profits does not yet exist. "These new companies let the Irish banks buy all their capital equipment and lease it back to them at very, very low rates," Coffey continued. Irish company law regards the leasing arrangements as transactions between companies, allowing the leasing parties to convey to the banks their deductibility. The banks thus benefit from the manufacturers' tax benefits.

"We pay 100% of agreed training costs," Coffey added. "That is a tremendous advantage. So far as we know, no other European industrial location undertakes to do it. Many of the American and Japanese companies have sent their Irish technicians to their home countries to be trained." We noted such major corporations from Japan in Ireland as Asahi Chemical, Fujitsu, Mitsui Mining & Smelting and Nippon Electric.

Foreign Investment

A tally of overseas investment in Ireland by countries for the 1972-1979 period showed the U.S. led the pack with $5.54 billion in constant 1979 prices, compared with $612.6 million from the UK, $447.4 million from the German Federal Republic, $272 million from Japan and $1.392 billion from all other nations.

Eight hundred overseas companies employ an estimated 85,000 people in Ireland today, according to Coffey. IDA encourages companies to reduce costs so the operations are more likely to stay and grow. If companies "sink roots in Ireland," as he puts it, they will create employment elsewhere in the economy.

IDA's fall 1982 report of current employment by the top 11 electronics companies in Ireland had three U.S. companies in the lead: DEC with 1,300 workers making minis. GE with 1,200 for components and Westinghouse employing 1,000 on a variety of products. Sweden's L.M. Ericsson had 700 in Ireland producing telecommunications equipment.

Dataproducts Corp. had 600 making printers; Storage Technology Corp., 550 making printers and drives; Telectron, 500 producing telecommunications equipment; Verbatim Corp., 350 for flexible disks; Wang Laboratories, Inc. with 350; Analog Devices, Inc., 300 producing integrated circuits; and Nixdorf Computer Corp., 300 making minis.

Local Talent

Enticing grant and tax concession packages notwithstanding, managers of U.S. installations in Ireland told us that a strong drawing point for them is the ability of the Irish people, who are rigorously trained, hungry for jobs, eager to work and to earn.

Ed O'Connell, manager of the DEC International Ltd. plant on a breathtaking site in Clonmel, Tipperary, gave us a breakdown of the 190 employees who worked there in mid-November 1982.

O'Connell, a graduate of Britain's Farnborough College of Technology, had been a manufacturing engineer for eight or nine years in England before joining DEC's then new operation in Galway. The Clonmel installation now employs 90 people doing direct production tasks as well as 100 support people. About 40 of the latter have Third Level educational credentials. A majority of the engineers have First Class Honors degrees in electronics.

"Our industry is technologically driven. Change to us is as common as the products we are making on the floor," O'Connell said, emphasizing that "we need people able to handle that degree of change without feeling uncomfortable.

"We have hired many first-class technologists," he continued, "be they engineers, MIS people or managers who would have little formal qualification, but they do have a great deal of experience in this specific industry. We saw an attitude which we wanted to hire, and we saw an ability to handle change and be comfortable with it."

DEC's Clonmel operation, now four years old, has implemented quality circles. Two years ago, O'Connell decided that it was necessary to break away from "the very heavy vertical organization" within the plant, where people talked primarily to their subordinates and their supervisors and did little talking to the other people in the plant

Photo by George A. Bowen

Patricia Hayes assembles a DEC power supply. She is working at a powered turntable adapted from a Swiss unit for assembling watches.

who perhaps "have a majority shareholding in solving problems, introducing new products or in implementing office automation."

The staff brought in what they believed was the world's foremost consultant on quality circles for a concentrated three-day session for this extension of the participative approach. They next involved core center managers and supervisors.

O'Connell now feels his highly

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Ireland's Industrial Development Authority predicts that the number of people employed in electronics, 16,000 in 1982, will double by 1985, when annual output for the Irish electronics industry should exceed $2.5 billion. Available candidates for jobs are among the youngest in Europe. About 50% of the labor pool in Ireland is under 25 years of age.

trained staff helps formulate strategy and tactics necessary to meet what they believe will be the outside competition. He says they delegate the operation of the plant "within the bandwidth of goals to be achieved" to the center managers and supervisors.

"They saw the opportunities that were being opened up to involve many more people in solving the day-to-day problems. That allows the staff and myself to go away to solve the problems that are going to be major roadblocks to our future," O'Connell said.

One senior engineer and a software specialist told us that virtually all their work is on innovations. In the automated plant, the production people do all the manufacturing and inspection for quality control.

While it may be true that engineering talent is abundant in Ireland now, when DEC went there a dozen years ago, most graduates from the universities' engineering colleges had to find work outside their country. And effective top management people are much sought after. DEC is proud that it has lost only two senior managers in four years — one to manage Wang's operations in Ireland and the other to Analog Devices.

The facility's personnel turnover is running at an average rate of 3½% to 4% per year, reported on a monthly basis, according to O'Connell. DEC Ireland does not have a union, he added.

At CPT Ireland (see box on In Depth/7), all but three of the entire staff are Irish. Over the last 12 months they have put in 27% overtime — one reason why more are being hired. Personnel manager Noel Glennon said the applicants he had interviewed were above average in their preparation, although people with applicable industrial experience are hard to find. All but two now on the payroll had received training under IDA grants.

Production workers at CPT were 100% unionized under what Glennon said Americans might call a "sweetheart agreement." He said there are no problems: "There are claims; we negotiate them. We pay a good wage. It is not the highest, but it's good."

Attractions for Four-Phase

Executives at Four-Phase Overseas Corp. at the Mahon Industrial Estate in Blackrock, at the edge of Cork, find it advantageous to hire people with timely, pertinent university training and scant experience. Why did this software development affiliate of Four-Phase Systems, Inc., headquartered in Cupertino, Calif., and a wholly owned subsidiary of Motorola Inc., come to Ireland?

Aside from IDA's making their entry into the country very attractive financially, Four-Phase found that "it is getting extremely difficult to be a software developer in Silicon Valley," according to Peter G. Cook, Four-Phase senior director of applications development. Hiring people is the nub, he added.

"The number of companies is growing," noted Cook, who commutes between Cupertino and Cork. "Apple Computer, for example, is right across Saratoga-Sunnyville Road in Cupertino. And it is hiring, hiring, hiring. Any one of our people who wants another job doesn't have to pound the streets very long to get one, given that they have this rare and arcane talent. We decided that moving the development part out of Cupertino was a logical thing to do. I was hired about three years ago to develop a software shop in Portland, Ore. It has been quite successful, but that's only about 600 miles away from Cupertino.

"When the IDA opportunity came along, we thought, 'Let's go for broke. Let's try something several thousand miles from California.'" Cook is now responsible for software applications development that includes a group at Cupertino and others at Portland and Cork.

Ultimately, sales in the Common Market will be a factor, but "that's future." The sole Four-Phase goal in Cork now is to develop new software that it will sell back to the parent company. The company has hired two software designers from the UK, but the primary objective is to hire Irish professionals. Thus far, six designers are from Ireland. One reason for locating in Cork is the proximity of University College Cork and other educational institutions.

David Harrington, manager of Four-Phase in Ireland, told us that with the kind of work Four-Phase is doing in Ireland, the company prefers people who have been exposed to the latest academic theories, even when they have relatively less experience. "They have freshness, familiarity with the newest languages and newest operating systems. We are in a productive environment, [not merely] updating software that's been in the field four or five years.

"We're developing software on a 12- to 18-month cycle. When we need to find somebody who knows something about the latest software, we find it an advantage to have the universities close by," he said.

IDA states that the number of people employed in electronics, 16,000 in 1982, is expected to double by 1985, when annual output for the Irish electronics industry should exceed $2.5 billion. Available candidates for jobs are among the youngest in Europe. About 50% of the labor pool in Ireland is under 25 years of age. About 31% are under 15. Many of the young men and women we saw in electronics factories are in their early teens and show every sign of learning quickly.

David Hanna of IDA provided estimates that between 6% and 10% of Irish electronics workers are graduate engineers and another 15% to 20% are skilled technicians, the balance being production workers. Dan Coffey told us that Ireland is now "graduating 700 people with degrees in electronic and related engineering. With those from other scientific disciplines, the total is probably about 1,200 a year, and growing. Graduate degrees are about a third of that."

Ireland has five university colleges, nine regional technical colleges, two colleges of technology and two institutes of higher education. Three hundred technical training schools provide operator and craft training. Anco, the industrial training authority, operates 13 industrial training centers, where 15,000 trainees qualify annually, and the authority plans to double this output.

IDA and Anco support in-plant training schools that teach toolmaking and operation of sophisticated precision machines. Students of the National Institutes for Higher Education (NIHE) at both Limerick and Dublin work in industry for one of their four years of study.

Four-Phase Overseas recently hired six Irish software designers in their early 20s, who later had six months' training in Cupertino.

"They are all potential winners. I think we have found some very bright designers," Harrington said. "I've interviewed a dozen people since coming here. All the Third

(Continued on In Depth/10)

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CPT Offshoot Blooming in Irish Soil

CPT Ireland leases a plant in Ballincollig, a bedroom suburb of Cork, the Republic of Ireland's second largest city. Founder-president Dean F. Scheff seized advantage of the report that Data 100 Corp. — whose headquarters is outside Minneapolis — was about to close its Irish operation in January 1980. Data 100, a Northern Telecom Systems Corp. subsidiary, had used the 44,000 sq-ft facility built five years earlier to assemble minicomputers.

Scheff drove a bargain with Ireland's Industrial Development Authority (IDA) he wishes the state of Minnesota would try to emulate because CPT is doubling its headquarters' work space there. IDA made grants for 35% of the cost of new equipment. By November 1982, CPT Ireland was processing its fourth grant claim, which should bring £230,000 in addition to the £90,000 already recovered and received. A training plan envisioned £347,000 in grants over five years. This has since been exceeded by roughly £100,000, according to CPT Ireland's finance officer, Donal Healy.

CPT, named after the first Cassette-Powered Typewriter, has come a long way since Scheff founded his company in May 1971 with a staff of two and cash scraped from his business equipment dealership to pay the five people who first developed his products.

In the fiscal year ended June 1982, CPT Ireland shipped $12 million worth of word processors and peripheral equipment and supplies. It projects for fiscal 1983 that at least $50 million worth will be produced by a work force whose number may rise to 120. That level of production approximates throughput of nearly half a million U.S. dollars per worker. Overall, CPT gets $106,000 per employee.

When Data 100 closed its Ballincollig plant, CPT's executive vice-president was able to hire all the Data 100 engineers and managers, thereby avoiding the need to recruit. CPT trained key people in Minnesota at IDA expense and was able to begin operations on June 1, 1980 with about 50 employees.

Of the 102 employees at CPT Ireland when we visited last November, 99 are Irish, two Scottish and one English. Three of the Irish employees had lived for long periods in the UK. (On our visit last fall, we met quite a few men and women who had returned to their native Ireland when they found paying work in electronics.)

The fourth quarter of the recessionary fiscal year 1982 ended June 30 was CPT's 40th consecutive profitable quarter. Revenues reached $145 million, 43% above 1981. Net income of $15.8 million was up 27%. CPT's eye is clearly on the future, judging from its investment of more than $20 million in such capital projects as computerized test gear and automated production equipment, much of which is replicated in the facility in Ireland.

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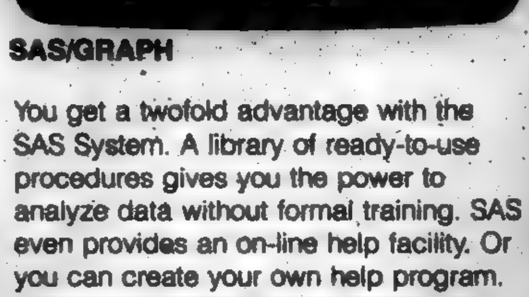

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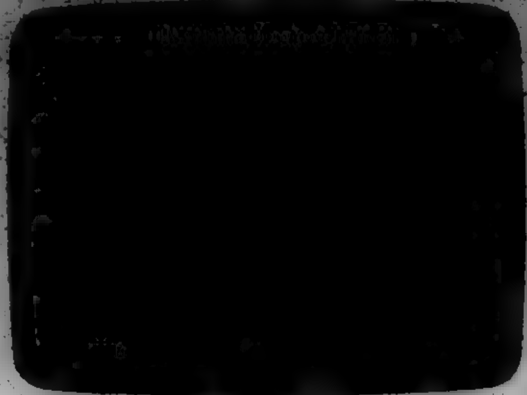

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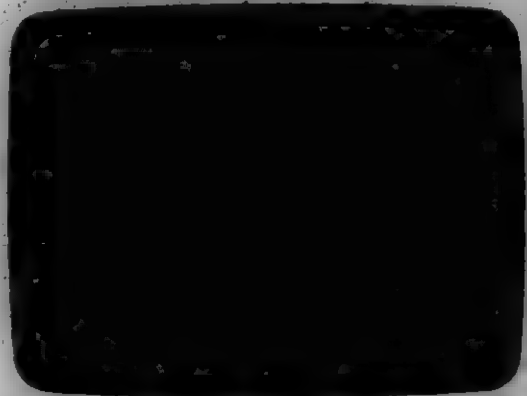

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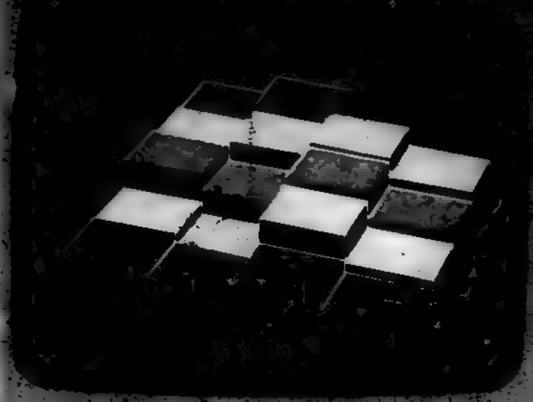

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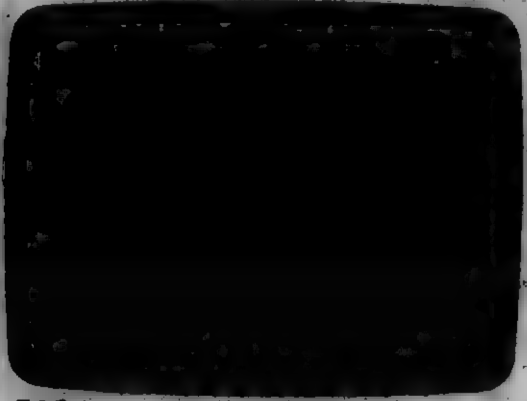

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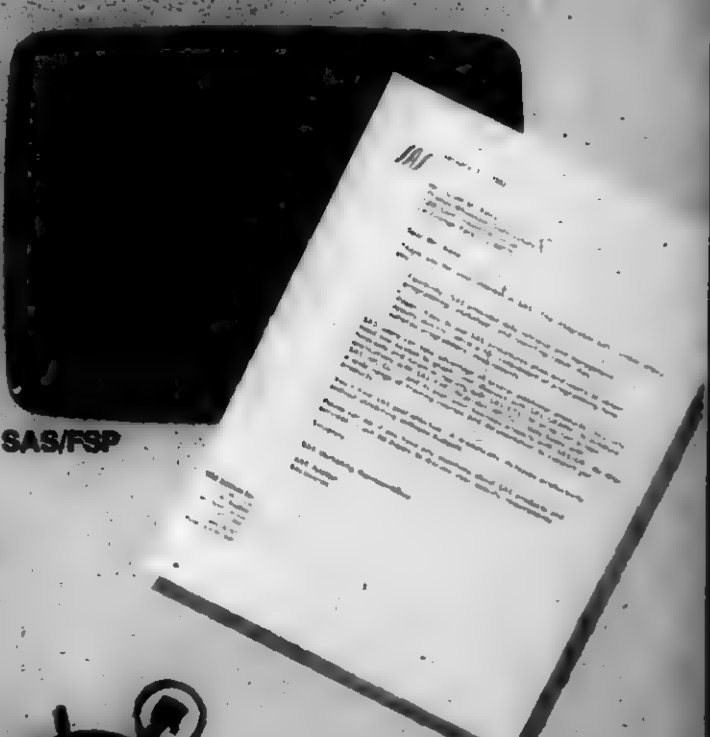

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(Continued from In Depth/6)

Level graduates, whether they are from the universities, the National Institute of Higher Education or the regional technical colleges, have been taught by people who are plugged into the latest developments in software technology and hardware as well.

"There's an excitement that most people I have interviewed share. I'd rather hire someone young and inexperienced than someone who has been around a few years and wants to change jobs for financial reasons," he said.

Harrington finds Irish higher education quite different from that in the U.S. He attended the University of Kansas, studying liberal arts with a math focus. "I have a degree in math but also had Western civilization, European history and so on. They don't have that here in Ireland; they are specialized in whatever field they choose — engineering, math, physics, business. They come out with a fairly rigorous education, with exposure to the latest academic thinking in the subject, which is very good for us."

Secondary-school instruction in math, science and languages is more rigorous in Ireland than in the U.S., according to Bill Lane, who teaches in the Department of Electrical Engineering at University College Cork and heads research on integrated circuits in the National Microelectronics Research Center there. He says the Learning Cert, an exam for certificate after secondary or Second Level school, is extremely difficult on an overall basis.

"In electronics and electrical engineering, we are in a very lucky position," said Lane, who moved to Cork from Toronto 3½ years ago. "There's enormous demand by the students to enter electrical engineering. We're able to take the cream of the crop."

MIS at Wang Ireland

Pat McKenna, Wang Ireland's MIS manager, formerly worked for Amdahl Corp. and DEC and now has a staff of 11. Wang's $75 million plant at Limerick does no product R&D, but McKenna thinks that by concentrating on new business uses of existing products, his company has made at least two unique accomplishments: a record for rapid implementation of materials requirements planning (MRP) and speedy customs clearance of export shipments.

Wang opened in June 1980 in a temporary facility. "We were on-line with things like bills of materials, materials movements and materials planning by the following May. That's very unusual. There's usually a 12- to 18-month lead time in an established plant" for putting MRP into action, McKenna said.

The new 160,000-sq-ft plant has implemented the first third of an MRP system called Amaps (Advanced Manufacturing, Accounting and Production System), written by Comserv Corp. of

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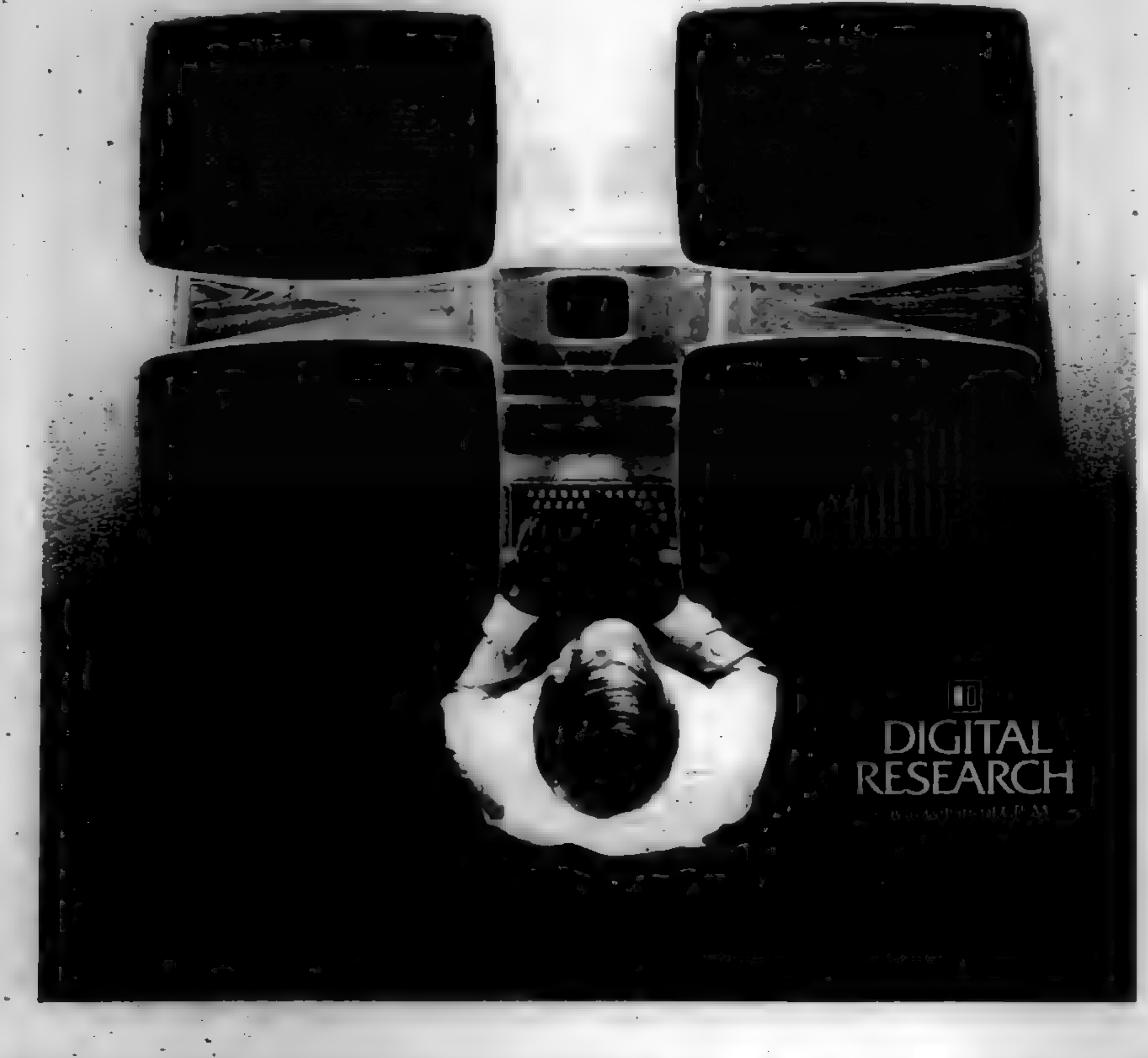

DIGITAL RESEARCH

Minneapolis. This integrated manufacturing system handles materials planning, production controls and financial reporting. "We were lucky that package was available with our hardware," McKenna said.

One practice he regards as unique, at least in an Irish context, is integration of data processing, word processing and electronic mail. When a traffic clerk sends off an invoice at the time a shipment is ready to go out, the invoice data is fed into the electronic mail system and sent to one or more of the 35 Wang offices throughout Europe. The equipment gets through customs faster, and the pertinent offices get clean copies of the invoice much sooner than if the company relied upon conventional mail. Wang has not yet fully implemented electronic mail to and from Australia, but transmission by telex has eased entry of shipments there.

Wang's distribution plant in Tewksbury, Mass., which developed the software, adopted the system soon after the Limerick pilot program proved the application's worth in April 1982.

Wang's Limerick facility produces nearly the entire Wang line — computers, word processors, office information systems, the large virtual storage multiple-purpose machines and peripherals — except for the firm's new micros. Wang was among the last of the top 12 U.S. electronics companies to enter Ireland. Several senior Wang managers in the U.S. had worked in Europe and noted that other U.S., European and Japanese firms had succeeded with their manufacturing in Ireland.

Wang, whose European marketing headquarters is in London, to date has no other production facilities in the EEC, but in October it announced plans to set up at Stirling Science Park in Scotland, where a 70,000-sq-ft factory is scheduled for completion in 1983.

In the current fiscal year that began July 1, Wang Ireland is expected to produce $155 million in exports from Limerick; the 1981-1982 output was $58 million. There are 350 employees now, up from 250 last year, with a rise from $35,200 in exports per worker to $44,285. Most exports go to EEC nations. Substantial shipments go to Australia. It costs no more to ship there from Ireland than from the U.S. Wang also sells to such non-EEC countries as Sweden and Switzerland.

Wang is building a second 160,000-sq-ft plant in Ireland into which it plans to move in another two years. It expects to employ 1,000 people there within five years, half on direct production tasks and the rest for support functions.

Export Earnings

Ireland does not try to sell itself as a low-wage country, according to the IDA's Coffey. It cannot compete on that score with Singapore or Korea, even though its labor costs are significantly less than in the rest of Europe. The IDA encourages firms to begin trial operations in rented space where they learn that assembly operations can be conducted competitively and then undertake more advanced manufacturing.

The Four-Phase operation in Cork does not do any manufacturing, confining its work to developing new applications software. Yet even with managers and designers traveling a good deal, the company's total costs run 10% to 15% lower in Ireland for a comparable amount of work, vice-president Peter Cook estimates. Manager David Harrington hopes that the operation's software products will earn at least as much as counterpart work at Four-Phase's Portland and Cupertino sites.

Manufacturing in an EEC country eliminates import duties of 10%. When CPT set up its Cork plant in early 1980, its total international sales, principally to EEC countries, were $17.9 million for that fiscal year. They have since risen to $42.3 million. Its sales to Western Europe in fiscal 1982 involved $15.3 million from international operations, $24.9 from domestic. Forty percent of all CPT production, and 30% of its value, is now sold internationally. The company plans to have all manufacturing for non-U.S. and non-Asian markets done in Ireland, where it is also setting up a design facility.

DEC does not report sales divided

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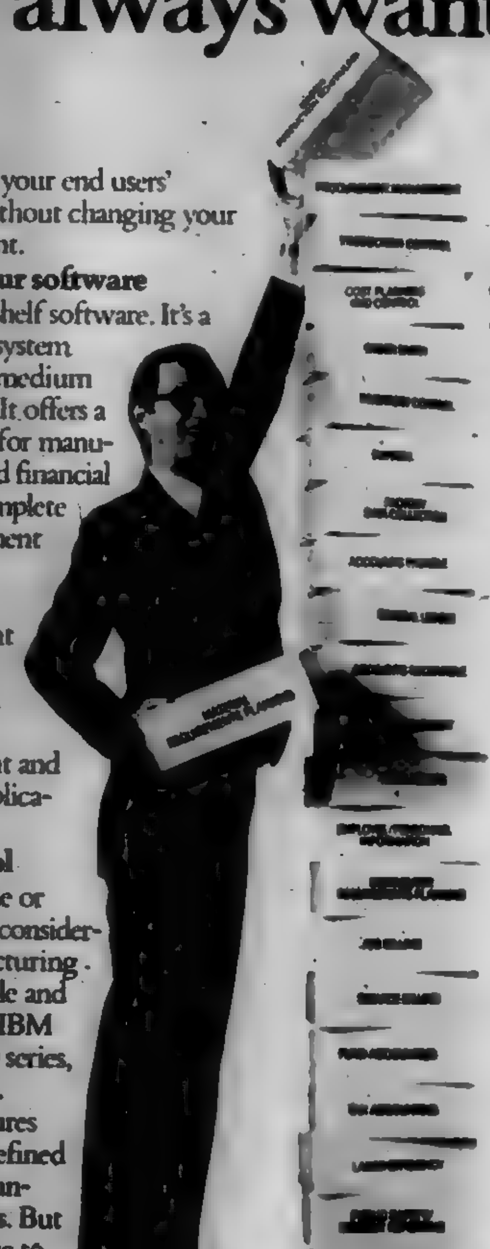

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by countries, but its current overseas sales total more than $1 billion — $1,006,000,000. It has two hardware manufacturing plants and one software plant in Ireland, two in the UK and one each in West Germany, the Netherlands and France. Possibly because DEC was the first U.S. computer firm to invest in Ireland, it has found the Irish government to be "one of our best customers, even though IBM and Honeywell are strongly represented by very effective sales forces," said Clonmel plant manager O'Connell.

DEC equipment is used by the national departments of Health & Welfare and Ordinance & Survey, and by the National Transportation Board to keep track of its fleet of buses and freight. Domestic sales amount to less than 5% of DEC manufacturing output in Ireland. O'Connell said he thought DEC equipment is "used exclusively for Third Level education in all the universities." DEC computers are also widely used in the technical colleges.

Corporate Communications

At DEC's Clonmel installation, "We've all got terminals in our offices," O'Connell said. "We're connected to account holders in Galway, in Reading, in Ayr, Geneva and the U.S." through leased dedicated phone lines. "I can send a message and probably get an answer within an hour from the States. That cuts down secretarial time, trying to make telephone calls, getting through to the outside operator who then can't find the guy . . . who [cannot be disturbed because he] is sitting at his terminal where my message is stored," he added.

"Within two months we're implementing Decmail, so we will have an internal mail system just for this plant, automatically linked down through networking to the International electronic mail system. Decmail will also include word processing, which involves work-integrated WP tied to International.

"Tying into the EEC X.25 Euronet Diane system will depend very much on how each national government in Europe approaches the availability of X.25," O'Connell explained. Unlike the U.S., where telecommunications is market-driven, communications systems are owned and controlled by government in every European country. That tends sometimes to slow up the introduction of technology and compatibility with existing technology, he added.

"Our local-area data networking strategy is that we will be compatible with the X.25 protocol. Whether or not that means we will be compatible with the X.25 that comes out of Lithuania in two years' time is a different question. Germany, the UK, France and the U.S., I have no doubt about.

"Part of our strategy over the next four years [here in Clonmel] is for us to be the sole European Digital plant for manufacturing the communications options necessary to configure Ethernet," O'Connell continued. "This plant will supply the entire European market for basically configuring a distributed systems network — the options that can configure any network in Europe. We intend to transfer that technology into our sales and marketing force. Our engineers here are configuring our experimental Ethernet ring to be put into this plant by early spring."

The sophistication and motivation of DEC's MIS department is as important as its engineering department in driving future innovation. The consequence for customers, in O'Connell's view, is that they should "actually use the systems that are there to understand how they link together.

"We learned a great deal about office automation in this plant when we introduced WP," he said. "Next we introduced electronic mail. Outside of MIS and Engineering, the rest of us probably multiplied our knowledge by a factor of 10. I have no computer languages myself, but I know how to receive a message and send replies. I'm not interested in Cobol or Basic but in what their applications will be five years from now."

Communications Problems

The government-owned Irish Posts & Telegraph (P&T) system is investing $800 million to lift telephone services out of a condition

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considered as bad as France's 10 years ago. In the first two years of this five-year program, half the money has been spent on buildings for new exchanges and microwave towers.

Satisfactory results have been reported in Dublin and Limerick, but frustration is rife in many other parts of the country. Four-Phase people, for example, are more often than not unable to access Motorola's direct line from Europe to the U.S. In early November, heavy rains soaked cables so that DEC Clonmel was temporarily incommunicado — but floods anywhere can cause such an impasse. The National Microelectronics Research Center at Cork has an auxiliary generator, but does not have the advantage of securely uninterrupted power supply.

So far as telephony goes, though, fully digital, automated service is "promised" in two more years. But just as in large U.S. undertakings, everything is not going exactly as planned: The new exchange building in Bandon is reportedly half as large as needed, but P&T defenders, when told that a wall must come down to permit an addition, said, "At least we got the project through planning."

And there are visible improvements in telephone service. Although residences must wait four years between applying for a telephone and getting it, businesses are said to receive prompt installation. And Pat McKenna of Wang says the Limerick plant has had no telephone problems whatsoever.

Irish phone bills are not itemized. They tell the number of message units used and their total cost. If a corporation chooses to monitor outgoing toll calls, it can.

Recessionary Impacts

Ireland has had a rougher experience during the worldwide economic recession than most countries with open societies. Inflation by late 1982 was 17%, unemployment, 14% and rising.

Some U.S. executives find it odd that the IDA recommends they enter into contracts with unions on the grounds that 75% of the manufacturing labor force is unionized. Every year or 15 months, a general agreement called the "National Understanding" sets prevailing wages and salaries in various sectors.

Silicon wafers enter furnace chamber at Analog Devices' Limerick plant.

An IDA study of foreign manufacturing operations in Ireland a few years ago reported that four out of five firms had lost no work time from strikes and nine out of 10 lost less than one day per employee because of labor difficulties. That is industrial peace for the private sector, even though public workers have had more frequent and prolonged interruptions. The 1980 postal strike, for example, lasted several months.

Ireland's per capita external debt of $2,000 rivals that of Poland and Mexico. But half its gross national product is exports that earn foreign currency. Ireland's national solvency is attested by the World Bank. The new cabinet of Prime Minister Garret Fitzgerald will surely continue to support IDA programs. The coalition may even tax farmers, whose free ride may finally end.

As in most industrial nations, Ireland's unemployment is directly influenced by high technology. The 1981 three-volume report, *Microelectronics: The Implications for Ireland,* prepared by the National Board for Science & Technology (NBST) in Dublin, financed by the Irish government and the Commission for the European Communities, showed that the use of microelectronics "will probably lead to a reduction in jobs," but the failure to exploit microelectronics would lead to "increasing uncompetitiveness" whose "secondary effects on employment could be far more serious than the direct displacement effects."

The NBST predicted rising employment in information industries: "While some administrative office jobs may become redundant, the overall information industry will increase substantially. The key issue here is productivity ... Machines and systems of the 'office of the future' are expected to increase productivity dramatically." Even though some researchers argue this will mean fewer information-handling jobs, the NBST report predicted that white-collar jobs will rise from 227,000 in 1980 to 312,500 in 1990.

Because domestic markets, industrial relations difficulties and other conditions differ from one European

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country to another, it may be prudent for U.S. firms to establish their presence in more than one EEC nation, as DEC did and Wang is now doing.

UK Competition

The UK is doing all its government thinks it can to compete with Ireland's industrial recruitment. In mid-1978, its Department of Industry announced two programs: the Microelectronics Industry Support scheme, allocated £70 million over five years, and Microprocessor Applications, given £15 million for openers. Encouragement of new software products was dispensed at £2 million per year, but £10 million additional over the next three years is in force. Among outright grants offered:

- Development and/or applications of new technology in microelectronics; software; fiber optics; opto-electronics; computer-assisted design, manufacture and testing; and robotics: up to 33½%, or in certain circumstances a preproduction order or contribution of 50% recoverable from sales.
- For R&D: up to 33½% on eligible projects up to £5 million.
- In-plant training: 40% of essential costs plus 40% matched from the European Social Fund.
- In "special development areas" near Cardiff, Glasgow, Liverpool, Newcastle upon Tyne and South Cornwall, 22% on new buildings, machinery and plant. In other "development" areas, these capital expenses are reimbursed 15%.
- For each new job in office and service industries, including R&D, up to £8,000 in special development areas and up to £5,000 in development areas.

Conspicuously absent from having a big Irish manufacturing plant is IBM, which has 300 sales and service people in Ireland. IBM's large presence in Britain is believed to total nearly 15,000 employees.

University Research

The outside of the tall gray stone Maltings building on the river Lee recalls dark, satanic mills from the early industrial revolution. The National Microelectronics Research Center of University College Cork moved into its renovated interior in mid-November. Its director, Prof. Gerard T. Wrixon, is a native of Cork who spent a dozen years in the U.S. pursuing doctoral studies at MIT and research work at Bell Laboratories.

Working with him are 15 professional and technical staff and 12 postgraduate students. As the center expands, their numbers are expected to increase 50%. Aside from £3 million in equipment and £1 million used to yield 1,300 square meters of laboratory work space on four stories, in 1982 35% of its £300,000 annual budget came from applications R&D in collaboration with industry.

Analog Devices, Inc. is funding a project on laser recrystallized silicon resistors. About 320 square meters of clean space for silicon fabrication have facilities for ion implantation, photo mask design by electron beam lithography, diffusion, oxidation and metallization. Currently under development is a polysilicon gate integrated circuit (IC) manufacturing process. This process is expected to be running by the end of 1983.

The U.S. Army, the Science Research Council of Great Britain, its counterpart in France and the Max Planck Gesellschaft in the Federal Republic of Germany sponsor R&D work in the center's gallium arsenide facility that produces circuits capable of work at much higher speeds than silicon ICs. For six years up to 1980, University College Cork's Department of Electrical Engineering, which Wrixon chairs, had made gallium arsenide devices that were chiefly low-noise, high-frequency Schottky diodes and metallic-oxide-semiconductor field-effect transistors (Mosfets).

New techniques led to design and fabrication of a 27-device digital circuit in early 1982. The center's electron microscope is used for submicron direct wafer lithography for making Mosfets with gate widths of less than one micron. In collaboration with the Electrical Engineering Department of the University of California at Berkeley, the Cork NMRC is developing a monolithic 90-GHz low-noise front-end and IF amplifi-

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STRATUS VS. TANDEM

(Or how the hardware fault tolerant solution supersedes the software based solution.)

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You can build a double computer inside one box for less dollars, as opposed to doing it in software, which continually needs maintenance and revision, as well as improvement."

by Aaron Goldberg
of IDC which
appeared in *Computerworld's*
December 28, 1981 issue.

STRATUS/32 – SYSTEM HIGHLIGHTS

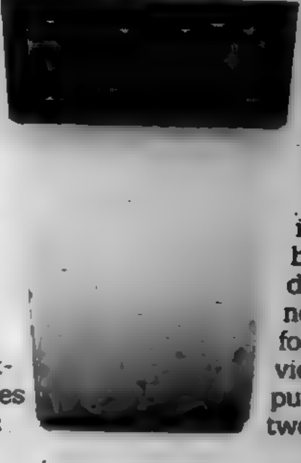
1. A simple hardware solution to fault tolerance that totally eliminates the need for extra application design and additional programming.
2. A design without performance penalties for fault tolerant operation – NO CHECKPOINTING!
3. A computer that pinpoints and isolates its failures, so repair is made quickly and inexpensively.
4. A system that can expand to 32 Fault Tolerant Processing Modules under a "single system image."

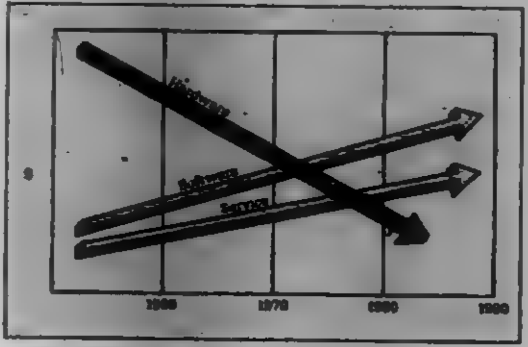
Now that the computer age is in full stride, 100% availability is fast changing from a luxury to a necessity. Downtime and its costs are unacceptable, especially when there is an alternative. Now that fault tolerant operation is becoming a universal requirement, there is demand for an improvement over the software approach used by Tandem. These computers must provide better performance, be easier to use, be easier to program and re-program, be less complicated and less expensive. We believe that the Stratus hardware based fault tolerant system answers these demands. Let us explain.

Why more hardware is better than more software.

The crux of the problem with software based systems is that they require complex, performance stealing software to provide fault tolerant operation. This software robs the system of precious resources because it uses processing cycles to pass status and checkpoint information back and forth between two computers. What's more, this passing of information can occur at four levels: operating system, user program, file management, and terminal control.

Stratus, meanwhile, has eliminated all this reliability software by having duplicate hardware components tightly coupled, dedicated to performing the same tasks at the same time. It's like having two computers in one, rather than two separate computers. Checking hardware logic detects errors with no performance loss and stops failing components instantly. The duplicate partner continues without interruption, unaffected by the failure. This is all transparent to the programmer and the user. With Stratus, there is no performance or data loss when there is a failure, no operator intervention, and no special programming.





While software costs will rise because they are people dependent, experts agree that hardware costs will continue to fall.

Why Stratus is easier to implement.

The Stratus designer and programmer might as well be dealing with a conventional computer; one of them, not two.

Programmers are in a familiar environment. By providing industry standard languages, applications can be moved over without redesign or major reprogramming. Fault tolerant operation is a bonus, not a complex effort.

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Now that the world relies on computers it needs a computer it can rely on.

er. Several local industries support and are helping work on filter design and manufacture, very fast digital circuits using gallium arsenide elements and high-power automatic laser drilling of through holes in dielectric layers in the center's Thick Film/Hybrid Circuit Laboratory.

An Applicon layout system, pattern generator and step-and-repeat camera make possible design of all IC photomasks and their fabrication in-house at the center.

The center is collaborating with Cornell University investigators to develop a finite element model for a gallium arsenide Mosfet. It has also obtained recent funding for two- and three-dimensional simulation programs for MOS devices.

While the IDA uses the NMRC as a place to take visitors, it does not give it money. Center funds come directly from the central Irish government. Its investment is toward the day when grants and tax concessions may pale beside the magnetism of scientifically educated people.

Bargain Work Space

Critics could say that the IDA's sense of urgency may have led it to overbuild. Yet the many brand-new empty industrial plants in Ireland may offer an historic opportunity for multinational corporations.

Companies can start modestly, then deepen their presence. Verbatim Corp. had until recently used its Irish plant wholly to stamp out disks, but has recently begun a software R&D division.

"We have millions of square feet to offer," said Dan Coffey, "at knock-down prices. Corporations may want to rent for a year or two while they build their own facilities. They can perform some kind of assembly and test operation to prove to themselves that what we say about Ireland as a location is true.

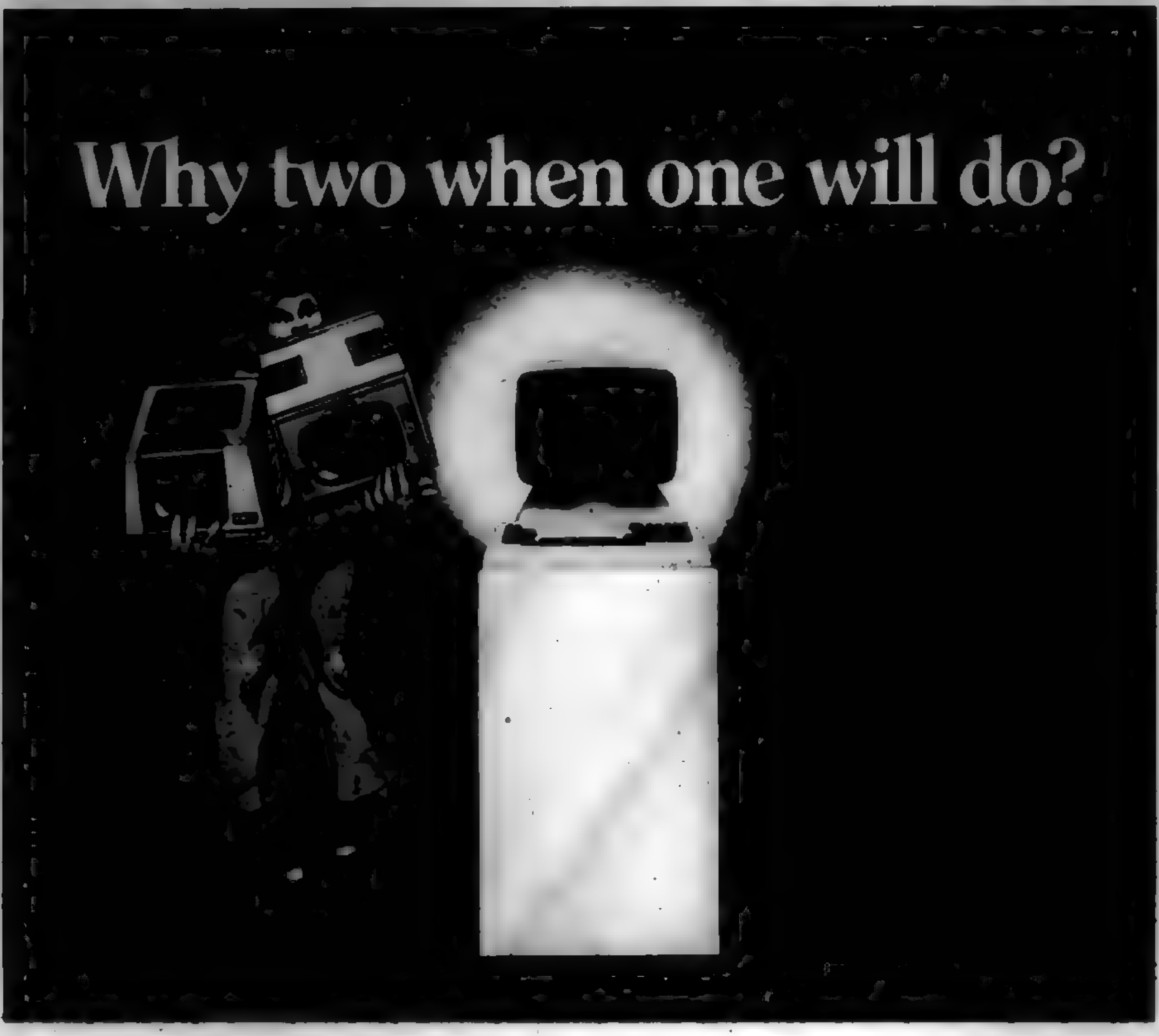
"Six to nine months in, they may decide to deepen their operation so that it won't be merely assembly-and-test. They can start looking around at their leisure for something else. If they need more than 30,000 or 40,000 square feet, they can move into twice that space while their own facility is under construction. We, the IDA, can serve as general contractors," Coffey added.

Perhaps the most convincing part of IDA's story is that its program has proved satisfactory to high-tech companies and to Ireland, time and again. Electronics exports now amount to $600 million annually, with the potential for much growth ahead.

About the Authors

Henry and Elizabeth Urrows are a writing team based in Ridgefield, Conn. They are currently completing a book on videotex called Punch Up the World *for Reston Publishing Co.*

The Urrows write principally on science for general readers. Their work includes articles for Infoworld, Microcomputing, Creative Computing *and* Personal Computing.



Lee Data's universal terminal system design provides access to both 3270 and VT100 applications.

Now with Lee Data's new 3270/Async Communication System (Series 400) you can eliminate the cost and inconvenience of needing separate displays for access to 3270 and VT100 applications.

The Lee Data universal terminal system approach is another innovative Lee Data design that allows a single Lee Data display to access applications and data from an IBM CPU, a non-IBM system such as DEC, H-P or Prime, and timesharing services. And a simple command entered from the display keyboard is all that is required to switch from 3270 to VT100 operating mode and back again. What could be easier?

The Series 400 System incorporates a new hybrid approach to system operation that is simpler and more efficient than protocol conversion. This approach allows a Lee Data controller to provide dedicated 3270 and VT100 processors for concurrent, but independent application access.

In addition, a single Lee Data controller provides you 3270 compatibility via either a remote BSC or SNA/SDLC or a local SNA or non-SNA interface, as well as 1 to 16 RS232C ports for your asynchronous application needs. Line speeds available are from 300 to 19,200 BPS.

The Series 400 System also provides you support for up to 32 devices, including Lee Data's unique All-In-One display that offers dynamic selection of 4 screen sizes—three 80-column and one 132-column. Lee Data's 3279-compatible color displays and a full line of printers are also available as part of the 32-device complement.

3270 and VT100 capabilities combined in a single terminal system—a reality with the new 3270-plus-Async system from Lee Data.

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Sage Unveils 16-Bit Supermicro

RENO, Nev. — Sage Computer Technology has announced the availability of the Sage IV 16-bit supermicro, said to accommodate up to six users and to surpass the capabilities of the Sage II machine introduced last March.

Both machines are based on the Motorola, Inc. 8-MHz 68000 processor and are reportedly capable of performing two million instructions per second. The performance is said to be comparable to that of high-end minicomputers at a mid-range to high-end business micro price.

Sage's P-System operating system runs on the Sage IV, which comes with 128K bytes of main memory — optionally expandable to 1M byte — a floppy or removable 5M- to 30M-byte Winchester disk and a 5¼-in. floppy backup. The cabinet measures 6½-in. high by 12½-in. wide by 16¾-in. deep. Because there are no wait states, a 20K program can load from the floppy in one second and from the hard disk in one-tenth of a second, the vendor said.

The Sage IV ranges in price from $6,800 to $8,600, depending on configuration, a spokesman said. Sage is located at Suite E, 35 N. Edison Way, Reno, Nev. 89502.

Operates With 'Keyplus'

Harris DDP System Out

FORT LAUDERDALE, Fla. — Harris Corp. has introduced an entry-level distributed data processing (DDP) system that reportedly provides basic DDP functions such as remote job entry and data entry.

The Harris 1640 system supports up to seven CRT stations and has numerous migration options for adding other functions as they are needed through field upgrades.

In addition, the 1640 system operates with Harris' Keyplus software, a set of data entry application programs and a library of utilities, a spokesman said.

A Model 1640 unit configured with 16M bytes of fixed and/or removable disk memory, data entry software, five displays with detached keyboards, a 300 line/min chain printer, a single remote job entry emulator and key entry processing applications with associated utilities can be purchased at $1,563, according to the spokesman.

More information is available through Harris Corp., located at 2101 W. Cypress Creek Road, P.O. Box 6200, Fort Lauderdale, Fla. 33310.

Plessey Announces Addition To Its DEC-Based Series 6000

IRVINE, Calif. — The Computer Systems Division of Plessey Peripheral Systems has announced an addition to its Digital Equipment Corp. minicomputer-based Series 6000.

The System 6000/230 is said to offer increased main memory, an 8-in. 80M-byte Winchester disk drive and built-in magnetic tape or floppy backup features not available from DEC.

Aimed at DEC users who require additional mass storage capacities in a multiuser environment, the system reportedly incorporates 256K bytes of main memory and either single or dual 8-in. floppy disk drives with 1M-byte capacity each or a ¼-in. streaming tape drive with 20M-byte capacity.

Compatible operating systems include Human Computing Resources Corp.'s Unity; Intersystems, Inc.'s ISM-11; and DEC's RT-11, RT-11/TSX, RSX-11M and RSTS/E. The system costs less than $25,000 from the vendor at 17466 Daimler, Irvine, Calif. 92714.

Prime Debuts CAD Workstations

NATICK, Mass. — Prime Computer, Inc. has introduced a family of intelligent workstations intended to improve productivity in computer-aided mechanical design environments.

The PW200 is a 32-bit virtual memory stand-alone workstation that reportedly performs solids modeling. The product incorporates dedicated modules of the company's Medusa software, an integrated mechanical computer-aided design (CAD) system. Medusa offers two-dimensional design and drafting and three-dimensional solids modeling capabilities.

The product's graphics capabilities and Prime's CAD software provide a complete productivity tool in a mechanical design workstation, the vendor said. With PrimeNet, the company's networking software, the user can link the PW200 with any of Prime's 50 series of 32-bit microcomputers, creating a design network to meet his needs. Meanwhile, each user retains his own interactive Medusa design environment, with the capability to share programs, information and resources stored or managed by the Prime host system.

Hardware for the PW200 consists of a graphics unit with a high-resolution color raster display monitor, a data-entry tablet, an alphanumeric keyboard and a joystick for each manipulation and control of the screen cursor. The processor features 1M byte of main memory, one sealed 68M-byte Winchester disk and a 15M-byte cartridge tape drive for storage, backup and transport of data, the vendor said.

The processor drives a microprocessor-based display controller over a high-speed direct memory access interface. The display controller can support six serial ports, according to the vendor.

Available in four basic configurations, the PW200 Series ranges in price from $61,000 to $95,000. The machines are slated for shipment in the third quarter of 1983.

Prime is headquartered in Prime Park, Natick, Mass. 01760.

Giving Micros The Business

Is a microcomputer helping you run your business?

Computerworld is preparing a Special Report on "Micros in Big Business" for its March 28 issue. If your business incorporates microcomputers in a way that significantly impacts overall data processing operations, CW would like to hear from you.

We are particularly interested in microcomputers that are directly attached to a large host processor, microcomputers linked through a communications network to a host processor and micros linked together. We are also interested in ways that micros are being used to replace larger processors or to offload some of a mainframe's work load.

If your shop is doing any of these things, we would like to hear about it. Write a description of the application and send it by Feb. 1 to Tom Henkel, Writer/Analyst, *Computerworld*, 375 Cochituate Road, Box 880, Framingham, Mass. 01701. Articles must be typewritten, double-spaced and no more than five or six pages in length. Accompanying graphs, charts and pictures are welcome.

Articles about stand-alone applications or those involving nonbusiness applications, such as computer games, will not be considered.

C. Itoh Announces Two Line Printers

LOS ANGELES — C. Itoh Electronics, Inc. has unveiled two desktop variable-speed dot matrix line printers.

The CI-300 and CI-600 line printers feature a variable speed shuttle mechanism and a 400 dot/in. resolution, according to the vendor. The CI-300 printer reportedly performs at speeds ranging from 80 line/min for letter quality and up to 300 line/min for data processing applications.

The CI-600 printer reportedly doubles the CI-300's printing speed range. Both machines also handle graphics, labels, bar codes, forms generations and diagrams, the vendor said.

The CI-300 is currently available for $4,500. The CI-600 is slated for shipment in the second quarter of this year and is priced at $5,700. More information is available from the vendor at 5301 Beethoven St., Los Angeles, Calif. 90066.

Digitex Introduces 7000, 8000 Micros

LOS ANGELES — Digitex has introduced the 7000 and 8000 series microcomputers, which reportedly provide business and professional users with multiuser systems capable of operating Digital Research, Inc.'s CP/M, Phase One Systems, Inc.'s Oasis and Dataplus on the same Winchester drive. Dataplus is the Digitex compiler and interpreter that allows programs originally written on Datapoint Corp. computers under the Databus language to operate in the Digitex environment under the Oasis operating system.

These systems are equipped with 8-in. fixed Winchester, removable Winchester or diskette storage and a 6-MHz Zilog, Inc. Z80B processor, the vendor said. Digitex features single-board architecture on the S-100 bus with the CPU, floppy disk controller, 128K-byte random-access memory and up to four serial I/O ports. It also includes two Centronics, Inc. parallel ports — all resident on the same board. This allows up to five slots available for expansion on an eight-slot S-100 motherboard, according to the vendor.

Prices for the Digitex system start at $5,995 for a 10M-byte system with a 128K-byte CPU, a spokesman said from 2044 Armacost Ave., Los Angeles, Calif. 90025.

HP Adds On-Site Service to Repair Options

PALO ALTO, Calif. — Hewlett-Packard Co. has added an on-site volume repair service to its existing on-site and depot repair options. The service is available to customers who own a minimum of 25 HP workstation products.

The Volume On-Site Repair Center Service (VRC) reportedly offers the low price of return-to-factory programs while eliminating the need to package and ship malfunctioning products back to HP, a spokeswoman said. Weekly scheduled service and some maintenance is provided on equipment covered under the agreement that is gathered for repair at one site.

Most personal computers, terminals, flexible disk drives, printers and plotters are eligible for the VRC program, and individual units count toward the required 25-product minimum, the spokeswoman said.

The annual cost for the Volume On-Site Repair Center service is said to be approximately 3% to 5% of the hardware purchase price, compared with HP's 6% to 10% for next-day, on-site service on a single unit. More information can be obtained from the Hewlett-Packard Co. sales office, located at 3000 Hanover St., Palo Alto, Calif. 94304.

Auto Dealers Get VIM/NET 3000

DAYTON, Ohio — Reynolds and Reynolds Co. has unveiled the VIM/NET 3000, the latest addition to its family of VIM/NET in-house computers targeted for automotive dealerships.

The microcomputer was designed for use by smaller dealer operations that previously could not afford a sophisticated in-house system, according to a vendor spokeswoman.

The VIM/NET 3000 reportedly contains expandable hardware and software capabilities. Its modular design is said to permit the growth of processing power, peripheral expansion and data storage capacity.

With 256K bytes of memory, the VIM/NET 3000 is available in two models — 10M- or 20M-byte units — has the ability for a single unit to drive up to seven separate terminals and uses 5¼-in. Winchester disk technology. It is said to be expandable into a larger system by connecting two or more units into a network to form a single, more powerful system.

Prices for the VIM/NET 3010 and 3020 units start at $16,800 and $19,000, respectively. More information is available from Reynolds and Reynolds Co. at 8000 Germantown St., Dayton, Ohio 45401.

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The Annual examination for the Certificate in Data Processing (CDP) will be held on May 7, 1983, at selected test centers throughout the world.

Specific requirements for this year's examination are detailed in the "Certificate in Data Processing Examination Announcement and Study Guide." The study guide and application form for the 1983 examination are available on request from ICCP.

Deadline for Filing Application is March 1, 1983

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Multifunction Printers Out

SANTA ANA, Calif. — Infoscribe, Inc. has announced three multifunction printers that incorporate a sound-reducing structural foam printer chassis.

The Model 1100 can be used in either a draft or data mode while operating at 200 char./sec. The unit operates in a correspondence mode at 100 char./sec, and in a business letter mode the unit operates at 40 char./sec. The printer can produce dot-addressable graphics and costs $2,995, the vendor said.

The Model 1200 uses a four-color ribbon to produce up to eight colors. The unit is available with the same printing speeds as the Model 1100 and costs $2,495, the vendor said.

The Model 1500 is available for high-speed applications printing at 400 char./sec. The unit operates at 200 char./sec in a correspondence mode and, like the Model 1100 and 1200, offers graphics capabilities, the vendor said from 2720 S. Croddy Way, Santa Ana, Calif. 92704.

Data Node Offers RS-232 System

SAN JOSE, Calif. — Data Node, Inc. has announced the addition of the DN81 single-drive RS-232 CPU system to its product line.

Connecting the DN81 to a dumb terminal configured to a host allows the user to have a personal desktop computer, according to the vendor. It can reportedly communicate with any CRT terminal that uses RS-232.

This system reportedly offers a single 8-in. drive with 500K bytes of storage capacity, a Zilog, Inc. Z80A processor, 64K bytes of random-access memory, 4K bytes of read-only memory, Digital Research, Inc. CP/M operating system and Data Node's operating software.

This product is priced at $1995, the vendor said from Suite 103, 1440 Koll Circle, San Jose, Calif. 95112.

Printer Offered For Data Logging

ADDISON, Texas — Telpar, Inc. has announced the PL20RM, a 20-col., panel-mount thermal printer for data logging and other general-purpose, hard-copy applications.

The unit is available with 96 Ascii characters and comes with switch-selectable parallel or serial interfaces. The thermal printer can operate with either an ac or 12-volt dc current, the vendor said.

The PL20RM costs $575 through P.O. Box 796, Addison, Texas 75001.

Alloy Unveils Tape Controller

NATICK, Mass. — Alloy Computer Products has introduced an LSI-50 Streaming Cartridge Tape Controller that provides an interface to make the Control Data Corp. Sentinel streaming cartridge tape drive compatible with the Digital Equipment Corp. LSI-11 processor.

Each 450-ft streamer cartridge can reportedly store 48M bytes, unlike the 4.5M bytes typcially available at 512-byte record lengths with conventional start-stop tape systems, according to the vendor.

Functionally emulating the DEC TU-10/TM-11 tape system, Alloy's controller provides backup plus serves as a means of program load, the vendor explained. The streamer is reportedly error-transparent and writes bi-directionally to 11 tracks, so the operating system problems previously associated with soft errors and rewind timeouts between tracks are eliminated.

The single, quad-size product is priced at $1,195, the vendor said from 12 Mercer Road, Natick, Mass. 01760.

Boosts PDP, VAX Capacity

Unibus Repeater Introduced

HUNTINGTON BEACH, Calif. — Ranyan Computer Enhancement Systems, Inc. has unveiled a Unibus repeater said to permit users of Digital Equipment Corp. PDP-11 and VAX-11 computers effectively to double their system capacity by providing an external interface to the CPU backplane.

The BMA-1U Unibus repeater reportedly provides a physical and electrical extension of any Unibus so that up to 19 extra bus loads may be interfaced, using a bus extension of up to 50 feet from the CPU. The product consists of a single dual-width printed-circuit board that is installed in the connector paddle slots normally used for the Unibus cable or interconnect mode.

It is totally software compatible so that no new software is required, the vendor said.

Attachment of virtually any device to a PDP-11 or VAX-11 Unibus reportedly is permitted, including additional main memory, terminals and printers.

The only penalty reportedly incurred in the use of the repeater is a slight 80-nsec increase in access time when interaction occurs between devices on different sides of the BMA-1U. The BMA-1U Unibus repeater costs $1,480 from Ranyan Computer Enhancement Systems, 15239 Springdale St., Huntington Beach, Calif. 92649.

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5 Reasons to Move Up With CCI's POWER™ 5

1 **PerpetualProcessing™ Reliability –** Computer Consoles' Power5™ family of systems can withstand multiple failures because each subsystem operates independently with its own copy of the operating system. This contrasts with other "fail-safe" systems which depend upon synchronized pairs or multiple processors around a single shared memory. Designed with high volume transaction processing in mind, CCI's fault tolerant architecture has been a staple of critical telephone industry applications since 1973.

2 **A Highly Flexible Operating System –** PERPOS™, CCI's proprietary operating system, is designed to support high volume, high availability transaction-oriented environments. PERPOS, fully compatible with UNIX*, is easy to use, and supports program development. It also supports a full complement of languages, such as FORTRAN, COBOL, BASIC and "C" as well as data base management.

3 **Complete Networking Facilities –** CCI's Data Highway™ can be used as the interconnect vehicle for many types of local communications. It also functions as the vehicle to link independent subsystems in PerpetualProcessing. A Distributed Communications Applications Processor (DCAP) can be used, in conjunction with standard carrier facilities, to provide remote communications with other CCI or other vendors' systems.

4 **A Fully Compatible and Expandable Family of Systems –** Because CCI's operating system is used throughout the Power5 family, you can start with the Power5/20™, a self-contained single processor system. This can later be integrated into a multiprocessor system with thousands of terminals, configured to your requirements without unnecessary duplication of hardware.

5 **Established Support –** Computer Consoles has a fully trained Field Service force at over 75 sites throughout the United States and Canada. Installation and maintenance of every CCI system is coordinated by a network of system software and hardware support specialists.

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*UNIX is a trademark of Bell Laboratories.

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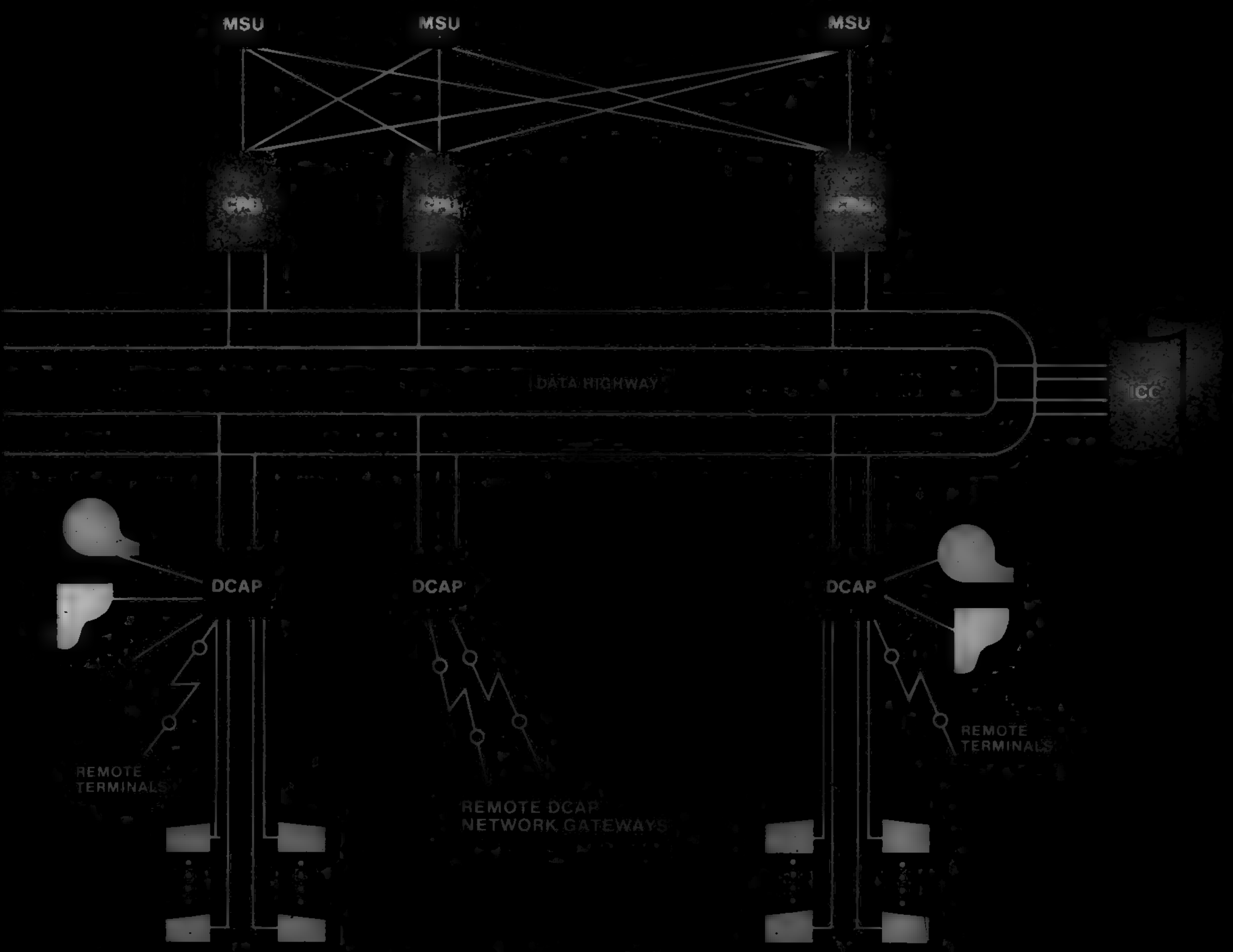

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PRINTER
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Graphics Package Out

DENVER, Colo. — Auto-Trol Technology Corp. has announced the release of its Advantage Series 5000 32-bit computer-aided design (CAD) software for architecture, engineering and construction applications.

The software runs on Auto-Trol's Advanced Graphics Workstation and Digital Equipment Corp.'s VAX series of computers. It enables users to tailor their CAD system to their company's own special requirements and allows Auto-Trol users to migrate their 16-bit CAD system investment to the new 32-bit-based technology.

The software is available on a stand-alone 32-bit graphics system called Advanced Graphic System and starts at $90,000 per work system for the complete system from the vendor at 12500 N. Washington St., P.O. Box 33815, Denver, Colo. 80233.

Uses 3740/System/34 Format

Disk Controller Out for Apple II

SAN DIEGO, Calif. — Sorrentino Valley Associates (SVA) has announced a universal flexible disk controller designed for Apple Computer, Inc. Apple II and III computers.

Megaflex is said to be fully compatible with Apple SOS, Dos 3.3, Pascal and Digital Research, Inc.'s CP/M. Because all diskettes utilize the IBM 3740/System/34-type format, diskettes are transportable from the Apple to other systems such as those from Altos Computer Systems, Inc. and Radio Shack and IBM's Personal Computer, the vendor said.

Features include "tri-mode" operation, which allows users to connect with 8-, 5¼- and 3-in. drives; a universal interface that plugs directly into an Apple II or III; and "soft drivers" that reportedly allow operation with a wide range of disk drives without read-only memory or hardware changes. Users are allowed up to four drives per controller for a maximum of 4M bytes of on-line storage.

Megaflex retails for $299 from SVA, 11722 Sorrento Valley Road, San Diego, Calif. 92121.

Powerpod Announced

EL MONTE, Calif. — Atlas Energy Systems has announced the MPC Powerpod, a combination rotary power conditioner and power distribution system.

The unit contains a synchronous motor that reportedly maintains a constant frequency to within ±1%, despite changes in load. The unit can absorb prolonged voltage sags and surges up to ±40% with 250 msec or more of power continuity ride through in the event of a total power failure, the vendor said.

The units are available in 10 KVA to 75 KVA capacities and cost between $17,000 and $26,000, the vendor said from 9457 Rush St., S. El Monte, Calif. 91733.

Power Series Introduced

LITTLETON; Mass. — Isoreg Corp. has introduced a series of computer power distribution systems called Guardsman, Isoshield and Isoreg.

The systems reportedly feature a high-visibility power monitor panel, transformer design, front access wiring cabinet, independent outlet and circuit breaker panels and mobility.

The Guardsman is intended for places where voltages are known to be clean and stable. Isoshield reportedly combines the isolation transformer characteristics with a Faraday shield to isolate and protect computers from continuous voltage spikes and electrical noise that can cause problems. It also reportedly features the vendor's Pentacore isolation transformer for load balance. Isoreg protects against voltage sags, surges, spikes, electrical noise; brown-outs and power outages lasting less than one cycle, the vendor said.

Prices for these products range from $14,000 to $70,000. Isoreg Corp. is located at 410 Great Road, Littleton, Mass. 01460.

Now you can add 31 IBM 3270 devices without adding 29 miles of cable.

Our new CMX Cable Multiplexer takes up to 32 inputs from an IBM 3274 Controller, combines them into a single signal, in a single cable, for demultiplexing up to 1500 meters away. With no performance degradation. So using an existing cable, you could add as many as 31 new terminals without pulling any new cable at all: at 1500 meters each, that's 29 miles of cable you don't need to find room for, install or manage.

Installation is easy, using existing RG-62A/U coaxial cable and BNC connectors. It's especially easy when you consider the alternative—pulling miles of new cable through already-crowded ducts.

Up to four cables can be run from the CMX, so you can support 3278, 3279 and 3287 devices on different floors, or in different directions, from one unit.

The CMX Cable Multiplexer system is available in 32-port, 24-port, 16-port and 8-port models. It is completely transparent to IBM user software and terminal operation and meets all type A interface and cabling specifications.

Another solution to your local communication problems from Ungermann-Bass, the Net/One™ company.

Please call the regional office nearest you for more information about the new CMX system: Santa Clara, CA, (408) 496-6464; Burlington, MA, (617) 273-5858; St. Louis, MO, (314) 434-1024; Dallas, TX, (214) 385-7090; Los Angeles, CA, (714) 553-1771.

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Remote Storage Unit Bows

ALLAMUCHY, N.J. — HDE, Inc. has announced the Hudson Data Logging System (DLS 400), a remote data storage unit.

The DLS 400 can be used for logging point-of-sale transactions to a host processor. It can also be used for order entry with or without stock verifications. Other applications include refrigeration and heating controllers with temperature and humidity recording, telemetering and monitoring laboratory results, according to the vendor.

Features include an eight-slot internal card cage and motherboard with gold-edge connectors, up to 330K bytes of disk storage and up to 64K bytes of random-access memory or erasable programmable read-only memory, the vendor said.

The DLS 400 costs $2,395, the vendor said through Box O, Allamuchy, N.J. 07820.

M20 Runs On CP/M 86, MS/DOS

TARRYTOWN, N.Y. — Docutel Olivetti Corp. has announced that its M20 microcomputer can operate with Digital Research, Inc.'s CP/M 86 and Microsoft, Inc.'s MS/DOS 16-bit operating systems, as well as the system's native operating system, Pcos.

The capability to run the two operating systems is reportedly made possible by a co-processor board, the APB 1086, which can be inserted into one of the processor's expansion slots. The board contains an Intel Corp. 8086 microprocessor with a 16-bit bus, the vendor said.

By adding CP/M 86 and MS/DOS, users can take advantage of a variety of 16-bit software programs. In addition, by adding a software emulator, users can also take advantage of 8-bit CP/M programs, the vendor said.

The APB 1086 costs $515. Additional operating systems must be purchased from their respective vendors. Docutel Olivetti is located at 155 White Plains Road, Tarrytown, N.Y. 10591.

CNI C-Net Interface Board Out

MOUNTAIN VIEW, Calif. — Cromemco, Inc. has introduced a single interface board that reportedly allows its users to link their stand-alone computer systems together into a distributed local-area network.

The CNI C-Net interface board connects the network medium — the physical data channel interconnecting network stations — with Cromemco's I/O Processor (IOP), a 4-MHz Z80A-based single-board computer with program store for downloading of the network station software.

The CNI board includes four programmable counter and timer circuits and an IOP to RS-232 interface, as well as an RS-232 serial input for use with a local terminal. This means that a complete, low-cost C-Net station can be built using no more than a power supply, a CNI board, an IOP board, a CRT terminal or any other RS-232-compatible peripheral, the vendor claimed.

Priced at $395, CNI C-Net is available from Cromemco, Inc. at 280 Bernardo Ave., Mountain View, Calif. 94043.

38

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Winnie Unit Out for S-100

GARDEN GROVE, Calif. — Advanced Digital Corp. has announced a 5¼-in. Winchester disk subsystem for users of S-100-based microcomputers.

The subsystem is built around the firm's HDC-1001 controller and is available in 5M-, 10M-, 20M- and 40M-byte configurations, according to the vendor.

The subsystem comes with a controller board, connector cable and a varying number of disk drives depending on the capacity.

A 5M-byte configuration costs $1,800. A 20M-byte configuration is available for $2000, the vendor reported.

More information is available from Advanced Digital Corp., located at 12700 B Knott Ave., Garden Grove, Calif. 92641.

NSI System Targets Hotels

PHOENIX — A microcomputer-based hotel management system that can accommodate up to four terminals has been introduced by New Systems, Inc. (NSI).

Simcom One/25A is said to feature reservation management with advance registration through 1999; rooms management with automatic room assignment and housekeeping status; guest accounting with automatic night audit; and various revenue, statistical and management reports.

System hardware can be expanded to five Zilog, Inc. Z80A processors with 320K bytes of memory to accommodate up to four terminals and seven printers. New Systems, Inc.'s computer is said to come standard with 6M bytes of Winchester hard disk storage (expandable to 19M bytes) as well as floppy disk storage for program loading and backup.

The system is priced under $10,000 and is compatible with Digital Research, Inc.'s CP/M. Simcom One/25A is priced at $9,995 from New Systems, Inc., located at Suite 9, 2505 E. Thomas Road, Phoenix, Ariz. 85016.

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Card Packages Introduced For IBM Personal Computer

BURLINGTON, Mass. — Several products compatible with the IBM Personal Computer have been introduced by IDE Associates.

The XPR series of multifunction combination cards is available with up to 256K bytes of memory, plus any or all of the following functions on a single printed-circuit board: parallel port, serial RS-232C port and clock/calendar/battery. Prices for the XPR combination cards range from $350 to $650 for one option plus 64K bytes to 256K bytes of memory. The second option is priced at an additional $45 and the third option at $30.

The MPR-512 memory card contains 512K bytes of memory on a single printed-circuit board, occupying only one expansion slot in the IBM Personal Computer. Included with the MPR-512 is disk emulation software, giving the option of using up to 320K bytes of memory as ultrafast in-memory disk, the vendor said. The price for the MPR-512 card is $915.

The MPR series of expansion memory cards for the IBM Personal Computer is available with 64K to 256K bytes of on-board memory in 64K-byte increments. It has full parity checking and generation, the vendor said. Prices for the MPR memory cards range from $275 to $575 with 64K to 256K bytes of on-board memory, respectively.

Additional information is available from the vendor at 44 Mall Road, Burlington, Mass. 01803.

Interface Cards Out for Apple II

SAN DIEGO — Microtek, Inc. has announced two video interface cards for Apple Computer, Inc. and Franklin Computer Corp. computers.

The Magnum-80 is an 80-col. card said to be Videx Corp.-compatible and available with an alternate character set built in. Said to eliminate "snow" on the monitor, Magnum-80 also has a 40/80 col. soft switch to permit autostart switching between the two modes.

The Rainbow-256 reportedly turns the Apple II or Apple II + into a 256-color red, green, blue (RGB) driver for analog RGB monitors vs. the conventional 16-color composite video output.

Prices are approximately $259 for each card. Microtek is located at 9514 Chesapeake Drive, San Diego, Calif. 92123.

Code Readers Announced

ELBRIDGE, N.Y. — Skan-A-Matic Corp. has unveiled the D4 series of modular bar code readers, said to process coded data from a remote optical sensor for display and transmission to a host computer.

Coded data reportedly can be accepted from a variety of optical sensors including hand-held code pens and fixed and moving beam scanners. Software is available for most popular bar codes. Ascii data can be entered through a terminal keyboard or key pad, and messages are transmitted in Ascii format via RS-232, 20mA current loop and 99-reader party line formats, a vendor spokesman said.

The D4's enclosure holds a mother-board with power supplies and a bus system with six plug-in circuit cards. Features include 20-char. fluorescent display, ¾A circuit breaker and switching power supply, according to the vendor spokesman.

The D4 series bar code readers cost $1,990 each from the vendor at Rt. 5 W., Elbridge, N.Y. 13060.

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How do you overcome the "not invented here" syndrome? Who selects applications software packages? What criteria do they use? This February 28th Computerworld Special Report on Applications Software will take you from selection to implementation with special emphasis on the issues that become relevant once you get your packages in house.

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USPS, Justice Tag Raytext Cumbersome

By Bruce Hoard
CW Staff

Two government agencies using Raytext, a turnkey shared-resource word processing system available from Raytheon Data Systems Co., have complained that it is slow and cumbersome.

In addition, one of the users maintained that the Raytext software lost data without warning and overwrote index pages, rendering them useless.

The Raytext system is based on Raytheon's PTS 1200 minicomputer and VT 1303 word processors from Lexitron Corp., which is owned by Raytheon. Both users, the U.S. Postal Service (USPS) and the U.S. Justice Department, found no fault with the hardware.

A spokesman for Raytheon said less than 20 of the systems, introduced in March 1980, are in existence. He added that the system is still commercially available and that all of the bugs have been worked out.

However, although he was asked, he did not supply *Computerworld* with the names of any satisfied Raytext users.

The USPS and the Justice Department said they experienced problems during May, 1981, more than a year after the system's introduction. USPS was using it on an ongoing basis while the Justice Department tested Raytext and rejected it.

Glenn Metzdorf, department supervisor with USPS, said the post office acquired Raytext because it wanted a bridge system that would allow it to use more of the Lexitron VT word processors, which it likes. He did not like the software.

"It lost information quickly without any kind of warning," he stated. Metzdorf said the integrity of the package is based on its index pages, which comprise entire files covering multiple pages. "Those pages could get overwritten or lost and then you couldn't access documents."

He also complained about slow response times. "The way in which the command executed the writer especially is very, very slow," he said. "The way in which you access documents is also slow."

On the positive side, Metzdorf said that both the professional and typing staffs were happy with the package's ability to manipulate data once it was accessed.

Although Raytheon was attentive to Raytext problems, when repairs were required, they sometimes involved sending

(Continued on Page 77)

Essential to Productivity

OA Termed Solution to Woes

By Bob Johnson
CW New York Bureau

NEW YORK — Predicting there will be an office automation device for every office worker within 10 years, John W. King, president of the K/3 Group, said here recently that this equipment will be essential to office productivity, which he described as the "critical issue for the '80s."

Speaking at the DMW Group, Inc.'s "World Update '83" seminar, King told attendees that present estimates of installed base business personal computers and workstations is a little over a million. However, from about 1988 on the number of these devices in a given organization is likely to double. That fact, coupled with an estimated 60 million office workers by 1992, is a likely solution to the productivity problems industry now faces, he said.

King revealed that office workers today spend as much as one-fourth of their time on nonproductive activities, including paper shuffling, chatting and visits to the water cooler. Additionally, nearly 50% of their time is spent on nonproductive meetings. "Typically, less than one-third an office worker's time is spent on profes-

(Continued on Page 77)

Wordtronix Offers Full-Page WP

MINNEAPOLIS — Wordtronix, Inc. introduced a full-page word processor with tie-in to electronic typewriters.

The Serif ET typewriting system uses the daisywheel-styled electronic typewriter as the printer without giving up the features and the power of the Serif line of word processors.

This is accomplished by providing a keyboard for the Serif ET unit as well as the keyboard that is inherent with the electronic typewriter.

It is a full-page system that gives the operator an exact replica on the screen of what will be typed on the paper and allows two operators to use the system at the same time, the vendor said.

With a single drive, keyboard, Typeright 1 software and adapter board, the system costs $4,990, without the typewriter. The vendor is located at 9950 W. 74th St., Minneapolis, Minn. 55344.

Accessories Offer WP for Typewriters

MOUNTAIN VIEW, Calif. — Chat Communications and Systel Computers, Inc. of San Jose, Calif., have jointly introduced plug-compatible accessories for electronic typewriters that will offer word processing and the ability to access automatically the telex, TWX and Bell systems networks, worldwide.

The Systel II consists of a 12-in. CRT terminal and a disk drive that connects directly to the electronic typewriter. The Chat II connects the Systel II to a printer and/or national and international networks.

The system allows businesses to upgrade familiar existing office equipment, the vendor said.

The system is available for approximately $5,000.

Chat Communications is located at 2438 Wyandotte St., Mountain View, Calif. 94043.

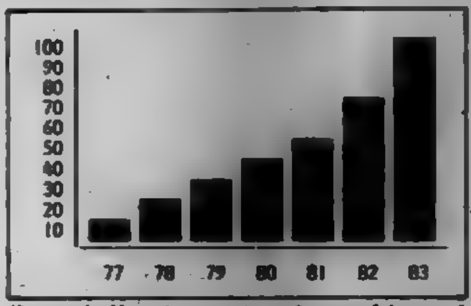
Graphics Integrated With WP

PORTLAND, Ore. — Microart Corp. has introduced a software program said to integrate advanced word processing capability with graphics.

The Image package allows the user to create bar charts, office forms, organizational diagrams, flow charts and line or block drawings. It can mix any of these graphics with text, a vendor spokesman said.

The package will run on the Televideo, Inc. 802, 802H and 950 systems and the Zenith Data Systems, Inc. Z89, Z90 and Z19 systems that run on the Digital Research Inc., operating system, CP/M.

Image is sold for $295. Micorart is located at Suite 961, 200 Market Building, Portland, Ore. 97201.



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OA to Be Essential to Office Productivity: Exec

(Continued from Page 73)

sional activities and less than 10% on analysis and design work."

The speaker maintained that the proliferation of equipment in the office environment will allow much of this wasted time to be turned into increased productivity. He said the preponderance of raw computer power, as measured in millions of instructions per second, will be outside of the computer room and on the office worker's desktop and factory floor before 1985.

King also noted that DDP is "dying a very early death." He explained that DDP no longer makes sense considering the advent of the microprocessor and resulting personal computers and workstations with their increased capabilities. All this points toward increased use of this equipment and a potential increase in productivity, according to King.

He said the DP manager has lost control over procuring personal computer equipment. King said the DPer can no longer prevent users from getting a personal computer if they want one, and this ease of acquisition further supports the idea of increased productivity. If users can acquire computers more easily, they will be used more frequently.

The MIS manager's role in an attempt at better office productivity must take the form of policy and standards setting, King said.

What a user looks for in office systems are things such as the ability to do a better job in the eyes of his boss and/or customer and an easier way of performing tasks, according to King. He also expects creativity, teamwork and user-friendliness.

Local-area networks will play a major part in making productivity gains, King claimed. He said that initially they will be used for resource sharing and the eliminating of counterproductive paper handling.

He maintained that the technology of local-area networks is not necessarily an issue in office productivity. If it works and is supported, it should be used, King noted.

Government Agencies Call Raytext Slow, Cumbersome

(Continued from Page 73)

disk packs to California for debugging, he declared.

"I don't think it was thoroughly tested," he commented. "It shouldn't have ever been marketed."

Joe Riley, assistant director for the office automation service within the Justice Department's Office of Information Technology, said he tested Raytext for correspondence control and tracking and found it wanting.

He said it was "cumbersome" and "slow" when seeking a document created two weeks past and characterized the system as stopgap.

"In order to access a record that had been completed or form that had been created and stored, it was very cumbersome to have to go back to the index and find where a document might be in that index," Riley stated.

Raytext's lack of a forms creation capability meant that individual word processor operators had to create a number of blank forms, store them and then call up one at a time, which required keying in the necessary instructions, he added.

The Raytheon spokesman defended the system, saying, "Raytext was a relatively new product when installed at the post office in early 1981 and had some difficulties that every new project has in start-up."

Of the Justice Department rejecting Raytext, he said, "The industry would find nothing unusual about a customer changing its mind about a product in today's evolving market."

He claimed that problems with the USPS system had been ironed out and the software revised.

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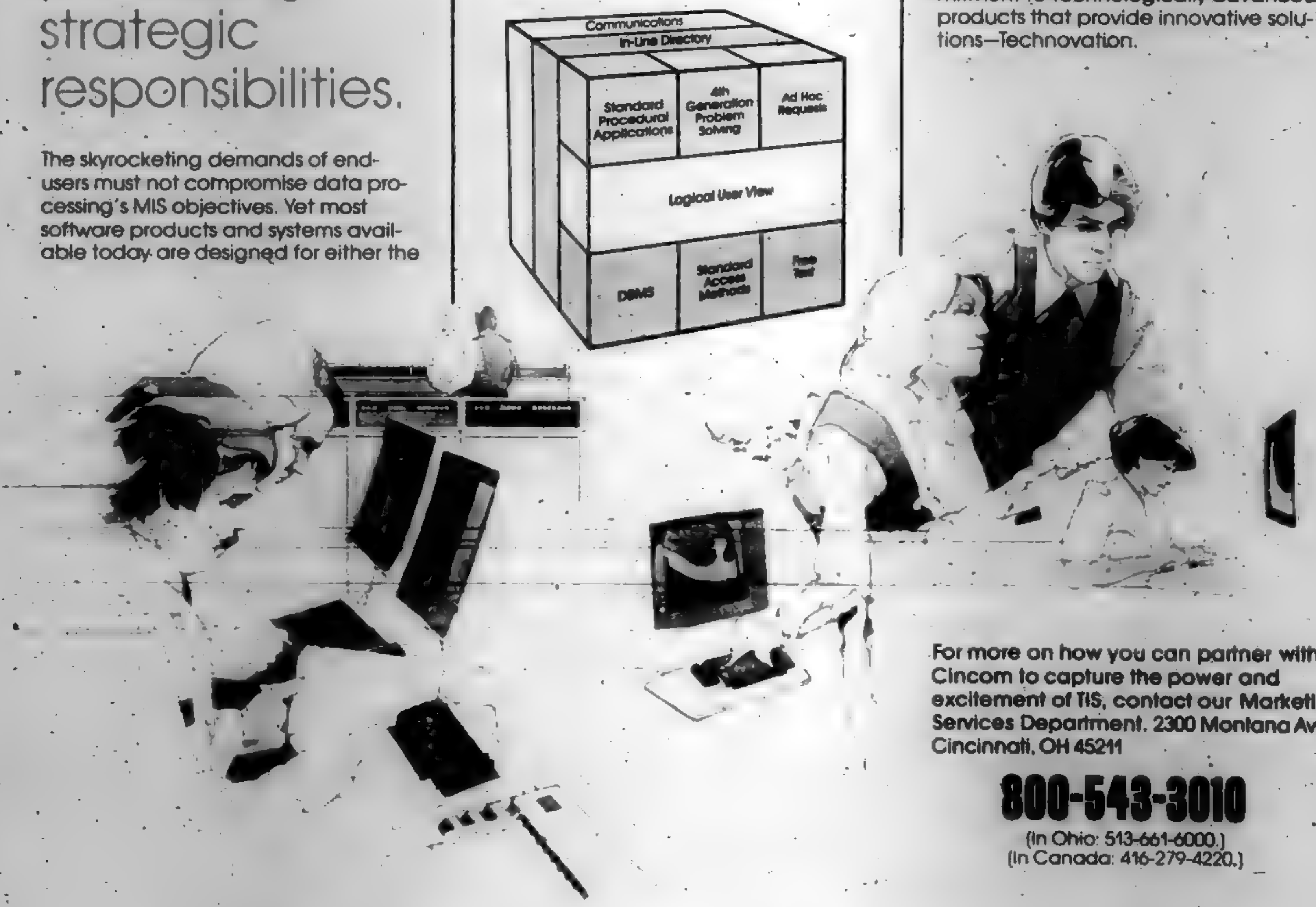

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Injunction Issued In First Test Of Copyright Law

By Paul Gillin
CW Staff

ATCHISON, Kan. — In a decision that should please software developers and owners, a district court judge here has issued a permanent injunction against a processing house charged with copying a program it administered and using it to compete directly with the program's owner.

The decision is believed to be the first involving a computer program under the Kansas Uniform Trade Secret Act of 1981, a law that is currently under consideration as a standard in several states.

Judge Morris P. O'Keefe Jr. entered a permanent injunction in Atchison County District Court against CWC, Inc., a Kansas City, Mo., service bureau; its president, Charles Carmack; Program Systems, Inc. (PSI); and its president, Rod Cook. O'Keefe also set a Jan. 25 date for awarding of damages in the case, which was brought by the Lockwood Co., a service bureau in Kansas City, Kan.

A defense lawyer said the decision will be appealed and that he may seek a writ of prohibition against the judge. "This litigation is not over with," said attorney Byron Fox.

But a co-counsel for the plaintiff

(Continued on Page 86)

Commerce Sees Services, Product Sales Up 18% in '83

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — U.S. computer industry sales of products and services should increase 18% this year, reaching an estimated total of $40.2 billion, according to the Commerce Department.

In its annual "U.S. Industrial Outlook" report, the department reported the value of 1982 industry shipments increased only 11.3% over 1981, well below the 15% Commerce had predicted at the year's beginning. The annual report attributed the disappointing year to the prolonged international recession and the strength of the dollar abroad.

'. . . total employment in the computer industry rose about 5% during 1982, to 351,000 workers . . . well below the 15% annual growth rate of total employment between 1977 and 1981 and reflected the softening demand in both the U.S. and major foreign markets.'

"Export markets slowed drastically, failing to cushion companies from the fall-off in domestic demand as in past recessions," the department said, noting the industry's financial results through 1982 "reflected a mixed market picture worldwide.

"Relatively healthy growth continued in such products as desktop computers, associated peripherals and 32-bit . . . minicomputers, while demand for 16-bit minicomputers and mainframe computers and peripheral equipment destined for OEMs . . . slumped appreciably," the report said.

Although "most companies suffered from substantially lower or negative profit growth [and] in some, a decline in revenues," Commerce added that "most industry executives are cautiously optimistic that demand, which began to recover during the latter part of 1982, would continue moderate growth in 1983."

The inflation-adjusted 18% sales jump predicted for 1983 assumes "moderate recoveries" of U.S. and European economies for the year. American computer-related exports will increase 20% to $10.7 billion, Commerce said. However, imports will increase even faster, rising 35%, to $2.9 billion, according to the latest projection, which said "this trade will continue to include large volumes of peripherals for the small-computer sector of the market, particularly printers and disk storage from Japan."

Elaborating on industry international trade in 1982, Commerce noted the anticipated upturn in major European markets did not occur in 1982, resulting in only a 4.5% sales increase, to an estimated $8.9 billion, with computer parts exports growing approximately twice as fast as equipment exports. "Shipments to customers in West Germany, France and Italy fell markedly, while those to Japan rose 10%," the report said.

Turning to 1982 imports, Commerce reported the U.S. purchased $2.1 billion in foreign computer goods, a 30% rise from 1981. Japan replaced Canada as the chief supplier, accounting for nearly a third of these imports. This slight increase

(Continued on Page 82)

Rockwell, Lehman Brothers to Pay

OPM Fraud Case Winding Down

By Bill Laberis
CW Staff

NEW YORK — Thick briefs filed in U.S. District Court here last week represent the closing chapters in the OPM Leasing Services, Inc. swindle, with the mechanism now in place for lenders to receive about half the money of which they were bilked by the computer lessor.

Under two- and three-party agreements filed in bankruptcy court by OPM trustee James Hassett; Rockwell International Corp., OPM's biggest customer, and Lehman Brothers Kuhn Loeb, OPM's investment banker, will make cash payments totaling $3 million to the OPM estate. The money will then go into a larger fund earmarked for payment to 19 institutional investors defrauded of an estimated $200 million, primarily by former OPM principals Myron S. Goodman and Mordecai Weissman.

Additionally, both Rockwell and Lehman Brothers have agreed to forego claims against the estate. Rockwell, for example, said it will not exercise any early termination rights with respect to equipment leases it executed with OPM. Rockwell and Lehman Brothers, which will become the primary creditors of the estate should the OPM filings be approved in bankruptcy court, have also agreed to forfeit their share of over $12 million in distributions and repayments from the estate.

In the two-party agreement between OPM and Rockwell, Rockwell agreed to pay an additional $1.45 million to the OPM estate in settlement of claims made against Rockwell by OPM. Rockwell also agreed to release interests or liens on any subleases of computer equipment subleased to OPM by Rockwell during the period of the swindle.

According to Hassett, OPM's trustee, the two-party agreement "would avoid the resolution of difficult question of law and fact with respect to issues involving, among others, Rockwell's potential administration claims for nonpayment of sublease rentals."

A source familiar with the OPM settlements, as well as recent published reports, have confirmed that Rockwell, Lehman Brothers, OPM's legal counsel and two accounting firms have all agreed in principal to pay a total of $65 million to 19

(Continued on Page 80)

Justice Department Will Not Challenge Formation of MCC

WASHINGTON, D.C. — The U.S. Justice Department has decided not to challenge the formation of a joint computer technology research venture spearheaded by Control Data Corp.

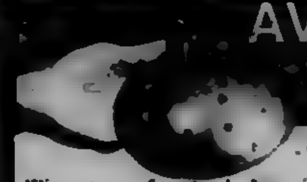
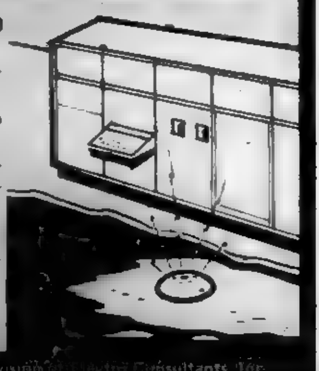
Assistant Attorney General William F. Baxter, head of the department's Antitrust Division, said in a year-end announcement that the government plans no action against the venture based on the department's initial investigation. He added, however, that the decision does not necessarily apply to all future activities of the Microelectronics and Computer Technology Corp. (MCC).

MCC, the brainchild of CDC Chairman William Norris, currently lists 14 other participating firms, including Burroughs Corp., Digital Equipment Corp., Honeywell, Inc., Harris Corp., NCR Corp., Sperry Corp. and Xerox Corp. The participating firms are expected shortly to announce their selection of a chief executive officer of the venture, after which further details on MCC's operations will be forthcoming.

When MCC was announced early last year, Baxter indicated he did not oppose the joint venture in concept. But the Justice Department warned that MCC has a potential of lessening competition in research. Its future activities will be scrutinized on the basis of "the percentage of the industry that chooses to participate as shareholders in the venture, the identity of the shareholder firms choosing to participate in particular research projects and whether the costs and risks of particular research projects are of a magnitude that warrant a joint undertaking."

Responding to the government announcement, CDC last week said that "it is encouraging that the Justice Department agrees with our assessment that MCC, as it is envisioned, far from restricting competition will in fact encourage even greater competition without a loss of U.S. preeminence in electronics."

Slated for start-up within a few months, MCC will eventually amass operating capital of $50 million to $100 million, according to a CDC spokesman. It will initially undertake broad research programs in advanced computer architectures, software productivity, packaging and computer-aided design and manufacturing.

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Realigns Product Support

Magnuson Drops Project

SAN JOSE, Calif. — In the wake of third-quarter losses totaling $14.2 million, Magnuson Computer Systems, Inc. has announced it will discontinue in-house development of a new generation computer, choosing to redirect its engineering effort to support of its current product line.

Moreover, the company expects the losses incurred in the last two years to continue into 1983, while company auditors are questioning Magnuson's ability to stay in business, according to a report the company filed recently with the Securities and Exchange Commission.

Meanwhile, the financially beleaguered mainframe manufacturer said it will pursue the acquisition of computer systems and peripherals from other companies in an attempt to offer a total system solution and leverage its existing investment in its end-user sales and service organization.

The result of these changes at Magnuson in its third quarter is the write-down of engineering and manufacturing equipment such that the company's net inventory value is now $412,000, according to company President Charles Strauch.

The $14.2 million in red ink, on third-quarter revenues of $4.5 million, was another in an unbroken string of quarterly losses going back to 1981, when Magnuson registered a $36 million operating loss for the year. The company attributed its bleak third-quarter results in part to the price erosion of the IBM 4300 series, against which Magnuson's processors compete.

Strauch said the company is still struggling "to get revenues to the point where we can generate positive cash from operations."

Recently the investment firm of Hambrecht & Quist purchased a controlling interest in Magnuson [CW, Nov. 29], a move the company claimed would set its financial house straight and send it down the road to recovery.

OPM Swindle Approaching Final Chapters

(Continued from Page 79)

investors cheated by OPM, the largest of which is believed to be Crocker National Bank of San Francisco. Laywers for Crocker, Rockwell and Lehman have declined to comment on the proposed $65 million settlement.

The insurers of Lehman Brothers and Rockwell will reportedly bear the brunt of the repayments, in amounts presumably corresponding with the degree of involvement, intended or otherwise, in the fraud. However, a provision of the proposed settlement is reported to include a clause wherein the five companies deny any acts of wrongdoing.

Half the Owed Amount

The $65 million represents about half the estimated $130 million that institutional investors are still owed from a total of $200 million OPM obtained from 1978 to 1981 with altered or completely phony computer leases.

OPM used the fraudulent leases, written out largely to Rockwell, to bilk investors of money they presumed was destined for the purchase of computers. Goodman and Weissman testified in December that much of the money they fraudulently obtained was given to various charities in the U.S. and in Israel [CW, Dec. 27].

Goodman and Weissman, cofounders of OPM and brothers-in-law, were sentenced to 12 and 10 years, respectively, in federal prison and were slated to begin serving those terms last week.

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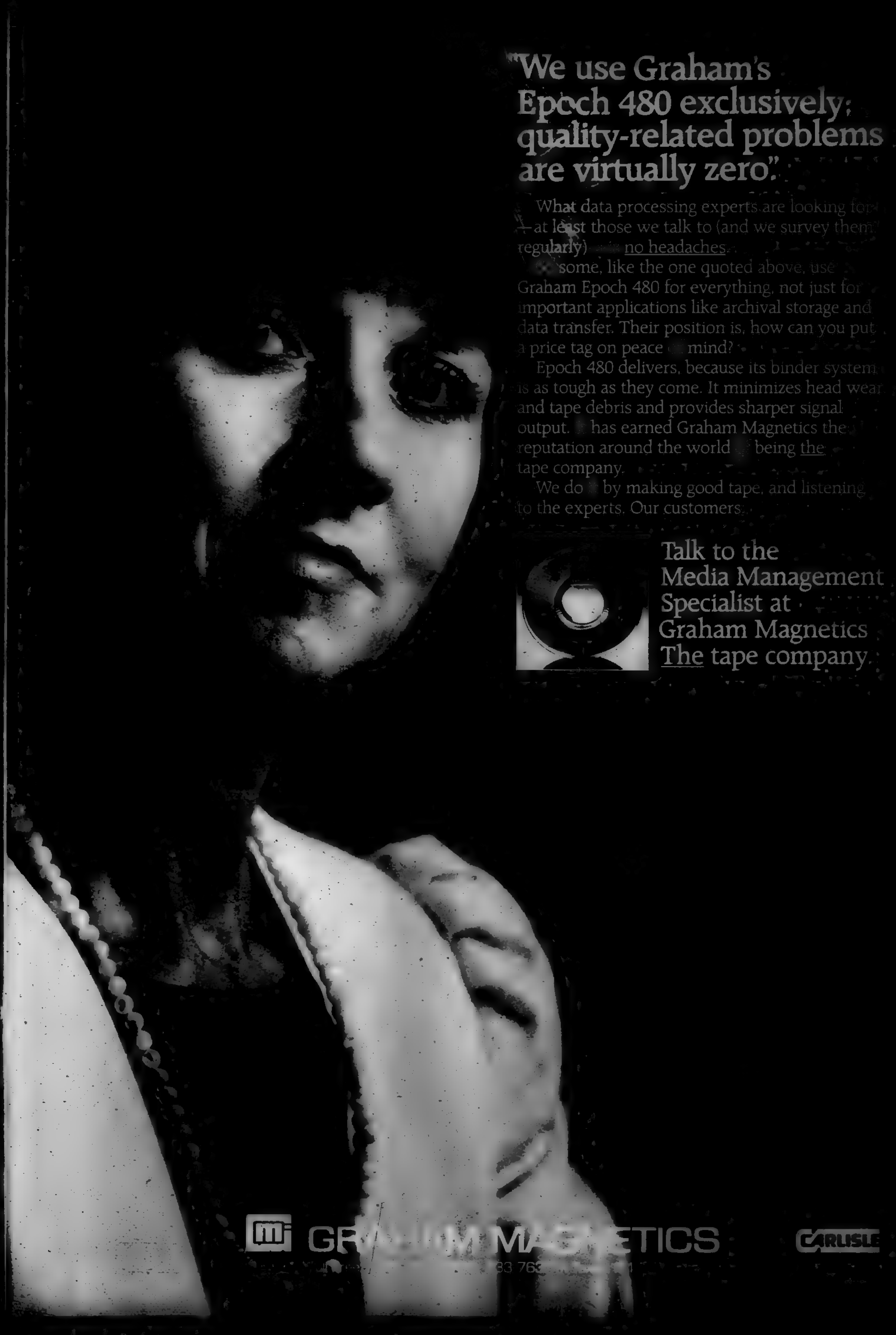

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Services Firm, School Join Forces

CINCINNATI — Tominy, Inc., a computer services company here, has launched a joint venture with Ohio State University whereby the school's College of Administrative Science will assist in designing Tominy's products to be compatible with a broader line of CPUs.

The project will reportedly expand hardware operating environments for the company's software products to include Digital Equipment Corp.'s VAX minicomputers.

Currently, the company claims to support 475 installations of its Data Base-Plus on the IBM Series 1 minis, while in-house product development efforts have targeted other IBM systems exclusively.

Thirteen Companies Push For Tape Drive Standard

LAS VEGAS — Thirteen manufacturers have submitted a joint proposal calling for a standard format for quarter-inch cartridge streaming tape drives to achieve industrywide interchange of recorded cartridges.

The proposal, QIC-24, will be submitted to the American National Standards Institute and the European Computer Manufacturers Association for consideration as a worldwide standard. It was assembled at a recent meeting called by the Working Group for Quarter-Inch Drive Compatibility (QIC).

Companies endorsing the standard include 3M Corp., Computer Storage Technology, Inc., Western Digital Corp., Irwin/Olivetti and Cipher Data Products, Inc.

Commerce Sees Sales Increase

(Continued from Page 79)

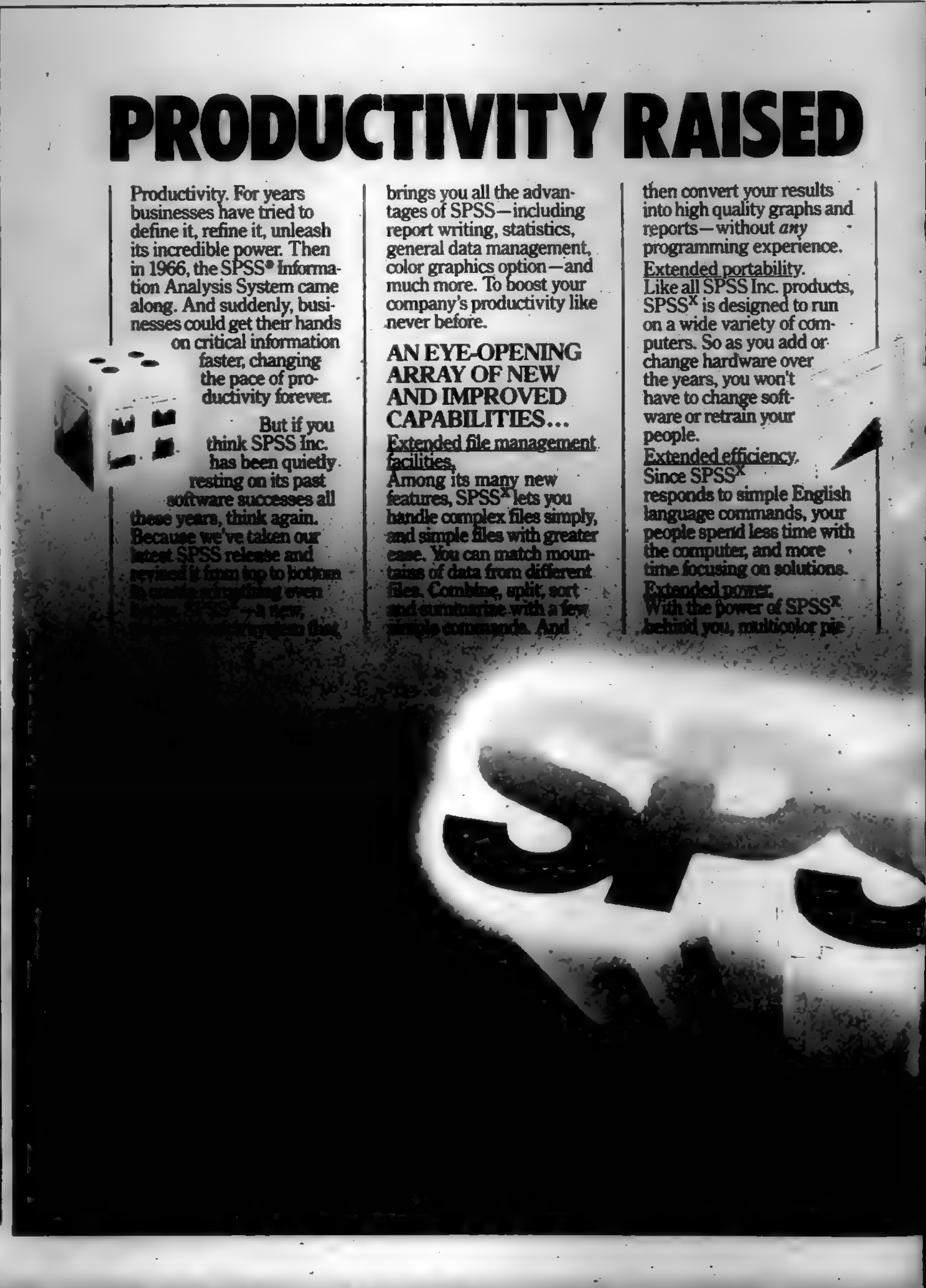
in exports and the "substantial growth" in imports narrowed the U.S. computer trade surplus to $6.7 billion in 1982, Commerce said.

The department's report continued that "total employment in the computer industry rose about 5% during 1982, to 351,000 workers. This increase fell well below the 15% annual growth rate of total employment between 1977 and 1981 and reflected the softening demand in both the U.S. and major foreign markets. Production worker employment also grew at less than its historic rate, climbing approximately 5% to 148,000 and representing about 42% of total employment.

The total plant and equipment expenditures of the top eight U.S. computer firms grew only 2% during 1981, to $3.7 billion, Commerce added, compared to a 37% increase during 1980. The department noted, however, that while three of the eight firms actually reduced spending below 1980 levels, the remaining five increased their expenditures an average of 18%.

Total 1981 research and development expenditures of 26 industry firms surveyed rose 15.3% above the previous year's level, to $3.8 billion. This rate of increase was slightly higher than the estimated 15.1% increase for all manufacturing sectors.

The long-term prospect for the industry, Commerce said, is for an 18% annual sales increase rate, compared to the 20% annual growth rate realized from 1958 to 1981.



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Report Predicts Local Systems Mart Shake-Up

SAN JOSE, Calif. — The local communications systems market — including local-area networks, private branch exchanges, protocol converters and data switching systems — is on the verge of a major shake-up, with large DP vendors becoming the major force in the market, according to a study released here by Strategic, Inc. Key players in this market shuffle are expected to be IBM and AT&T and the Bell operating companies.

According tq the report, the focus of competition is seen moving up from lower to higher levels of integration. The key to large-site competition reportedly will not be so much the provision of a particular solution as the ability to provide software that enables these solutions to function as components of a broader system.

To be successful, Strategic continued, vendors will have to have a variety of compatible solutions for voice and data traffic, resulting in a shuffle over the next few years of the players teaming up to cover all bases.

Large DP vendors, with IBM and its approach dominating, will be the main market force. Major implications are also seen for AT&T and the Bell operating companies, but they may be deterred by stiff competition from the opposite direction (voice), according to the report.

Distribution, the study said, is an emerging issue likely to become a determining factor in vendor selection. Major growth is expected in the market for gateways, interfaces and converters for integrating various vendor's equipment, thereby impacting bidding for large accounts.

"Impact of Broadband Local-Area Networks," which is based on a survey of 50 large-site users of local communications systems, is available for $20,000 from Strategic at Suite 215, 4320 Stevens Creek Blvd., San Jose, Calif. 95129.

Univac Sees Modest Rise In Fiscal '83

BLUE BELL, Pa. — The continued softness in the world economy and an anticipated snail's pace recovery in 1983 have prompted Sperry Univac officials to predict "modest growth" for fiscal 1983, which ends March [illegible] for the company.

Joseph J. Kroger, company president, said that he expects revenues from computer operations in calendar year 1982 tu increase 2% over 1981 to about $2.8 billion.

The value of new orders for computer systems and services, however, will be off by about 4% to $2.4 billion, Kroger predicted.

On a brighter note, Kroger noted that the company's defense business is booming. Univac's growth in this area is up about 20% over 1981 which projects to a $535 million increase.

As 1983 does not loom as a year of great recovery, Kroger said Univac will concentrate on productivity gains realized through additional automation of production facilities, "as well as continued cost control within all operations."

Univac recently signed a letter of intent to join in the Magnetic Peripherals, Inc. venture along with Control Data Corp. and Honeywell, Inc., whereby the three will pursue research of thin film storage technology.

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CA Offers Trade-In On IBM 8100s

BOULDER, Colo. — Computer Automation, Inc. last week announced a trade-in program that will reportedly allow certain users of IBM 8100 computer systems to swap them for the company's Syfa distributed data processing systems for network applications.

D.H. Methvin, president of the minicomputer manufacturer, said the offer is aimed at users who have had problems either integrating the 8100 into their data processing networks or programming the machines for specific applications. He explained further that the program would be most applicable to users who had secured two or three 8100s for program development before committing themselves to larger orders and then encountered "significant or insurmountable" problems with the machines.

Trade-in terms will be arranged on an individual basis, although Methvin said that in some cases the company would allow an 8100 user to recoup their full purchase price when signing an order for a Syfa system. Trade-ins will not apply to users who have leased their 8100s, he added.

Further information is available from Computer Automation, located at 4890 Sterling Drive, Boulder, Colo. 80301.

Injunction Issued in Test Of Kansas Software Law

(Continued from Page 79)

said the decision helps to solidify the legal definition of a software package. "A lot of opinions in the computer area try to cross the bridge of whether a program is more than just numbers," said David Ryan, who is also a professor of law at Washburn Law School in Topeka, Kan. "The judge in our case didn't bother with that. He said it has independent economic value and that was good enough for him."

The Kansas law defines trade secret as "information including formula, pattern, compilation, program, method, technique or process that derives economic value . . . by not being . . . ascertainable by proper means by other persons who can obtain economic gain by its disclosure."

During a trial held in late December, Lockwood called on witnesses who testified that a tax analysis and planning program marketed by CWC was nearly an exact copy of a program owned by Lockwood, translated from Cobol into assembler code. In rendering his decision, Judge O'Keefe said, "It has to be considered that input, format, output and master code," are all covered by trade secret protection.

CWC attorney Fox argued that the programs contained similarities in output format only. "The court has already indicated you can't take out of a programmer's mind the style he's developed," he said. "There are some rudimentary similarities in terms of coding names being similar, but that has nothing to do with the operation of the program."

The suit alleged that CWC's Carmack, a PSI employee, copied a tax analysis program originally developed for Lockwood by PSI and used it to woo Lockwood clients away to CWC, a company he created along with other PSI employees. One former Lockwood customer, Sumner County, Kan., canceled its contract with Lockwood last summer and signed on with CWC, the suit alleged.

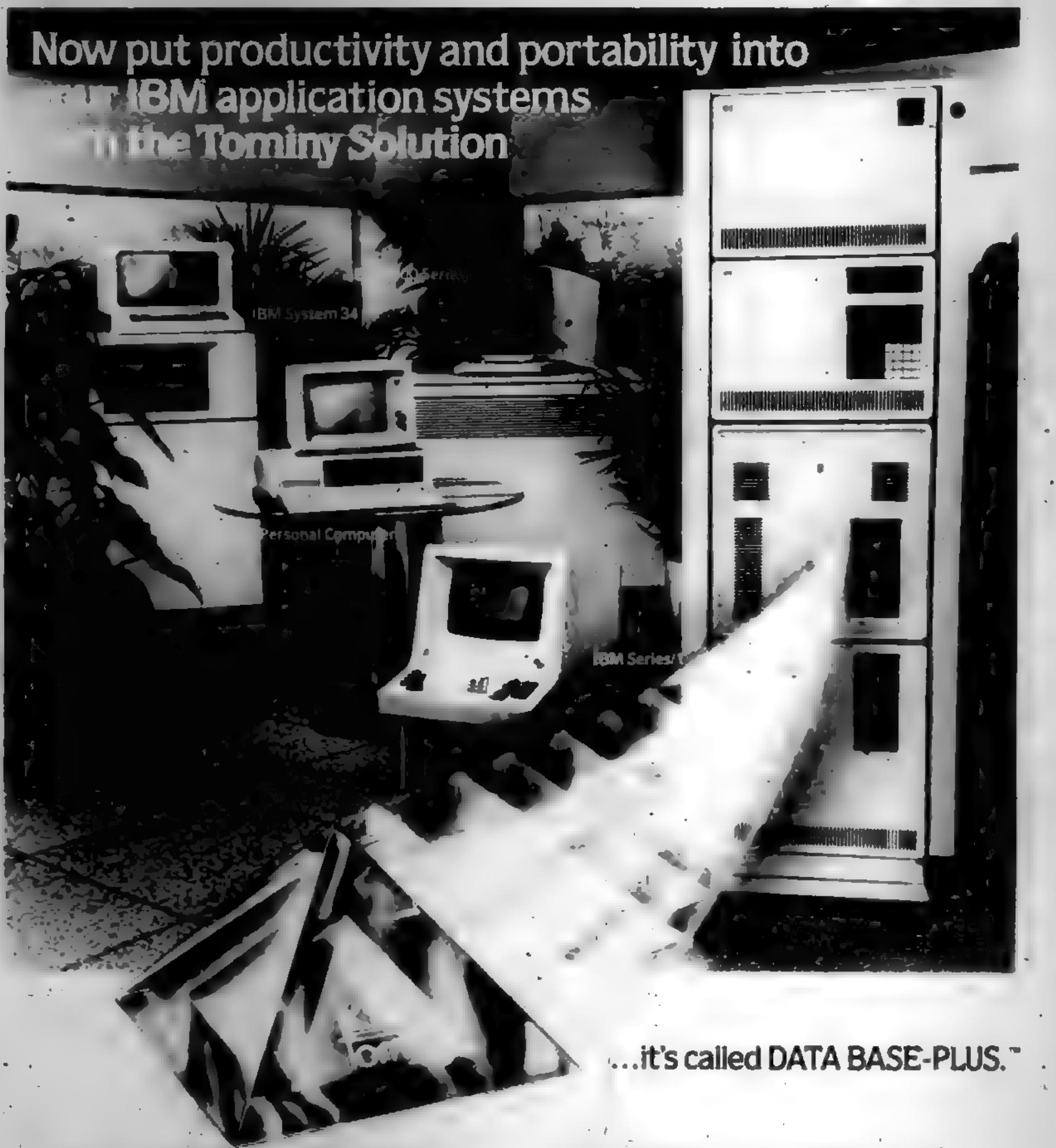
Lockwood charged Carmack and other PSI employees with using a bootlegged copy of the company's tax analysis program to establish CWC. Early last year, Carmack wrote a letter to a number of county governments, including several Lockwood clients, informing them that he would be starting his own company Jan. 1, 1983, "with the principal concern of providing DP services to county government," the suit alleged.

Richard Senecal, Lockwood's attorney, claimed Carmack began pursuing Lockwood customers, promising them they could convert to his program without making any changes in their current operations. Senecal said officials at Lockwood became suspicious when they learned that Sumner County was using a tax program very similar to the one they offered.

Lockwood filed suit Oct. 5 seeking a permanent injunction and damages "in excess of $10,000." At issue was the comparability of the Lockwood program, written in Cobol, and the CWC version written in assembler code. At the December trial, programming experts called by the Lockwood attorney testified that the master code of both versions was fundamentally the same.

Corrections

The stock performance of Management Science America, Inc. (MSA) was incorrectly represented in the Dec. 27 "Computerworld Stock Trading Summary." The change in stock price shown did not take into account that MSA's stock had split two-for-one on Dec. 1.



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Massport OKs Foreign Trade Zone for High Tech

By Tom Henkel
CW Staff

BOSTON — Plans for a $130 million high-technology research and production facility near Logan Airport here got a boost recently when the Massport board of directors approved plans to make part of the area a foreign trade zone.

The foreign trade zone classification, which will allow tenants of the facility to avoid paying U.S. import duties on parts and components as long as they remain in the foreign trade zone, is an extension of an already existing foreign trade zone at Boston's Commonwealth Pier.

Massport officials say 490,000 square feet in two of the proposed buildings, offically called the Massachusetts Technology Center, will be set aside as an foreign trade zone for tenants to manufacture, store, distribute and repair high-technology products including business machines, home computers, medical devices and other electronic equipment, Massport said. The project developer said the first of the buildings will be up late next year, with the remainder of the project completed three or four years later, Massport said.

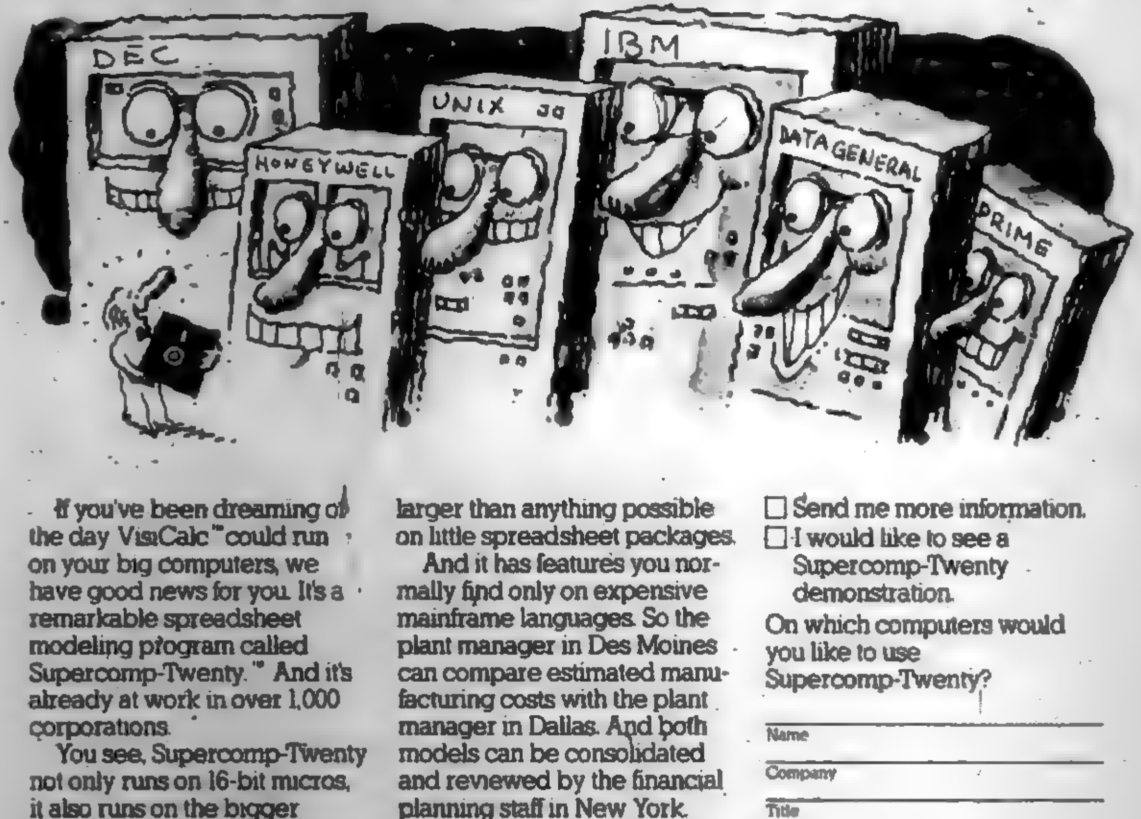
The proposed center will be the first foreign trade zone abutting a major airport and one of the few that allow vendors to repair as well as manufacture goods, according to Massport.

By setting up shop in the foreign trade zone, manufacturers of computers and other high-technology items can reap three major benefits. First, firms can stockpile imported components in a duty-free environment and pay duties only as items are brought into the U.S. Second, firms can manufacture and ship items abroad from the foreign trade zone, thus avoiding payment of any U.S. import duties. Finally, vendors of products composed chiefly of imported components can often pay less in U.S. tariffs by importing a finished product, rather than importing components and assembling the product domestically. By assembling products in the foreign trade zone, vendors can significantly reduce their import costs, according to Chris Koelfgen, president of a San Jose, Calif., foreign trade zone that owes about 60% of its business to Silicon Valley computer firms.

Planned for the Bird Island Flats area adjacent to Boston's Logan Airport, the technology center project will be incorporated into an air cargo facility that already serves some 1,000 high-tech firms each year.

There are currently 80 other foreign trade zones throughout the country. While some are devoted to other types of manufacturing, such as the Volkswagen Rabbit assembly plant in New Stanton, Pa., the foreign trade zone division of the U.S. Department of Commerce said that aside from the proposed Boston facility, two other foreign trade zones have a high concentrentation of high-technology clients. Those foreign trade zones are located in San Jose, Calif., and New Bedford, Mass.

A SPREADSHEET FOR GROWN-UPS.



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Exec Demand In High Tech Up

By Patricia Keefe
CW Staff

NEW YORK — Demand for electronics executives earning in excess of $75,000 per year rose to 14% of total demand for executives during the fourth quarter of 1982, according to Korn/Ferry International's 44th quarterly survey, called "The National Index of Executive Vacancies." While a point above the 1981 year-end figure, the figure also indicates a one-point drop in demand from third-quarter 1982.

That slight drop is blamed on the continued decline in semiconductor accounts, and a recovery is not expected in this segment until the second or third quarter of this year, the survey said. However, the electronics, aerospace and military sectors are said to be weathering the recession well, and there is a continuing need for research and development executives, particularly within software design.

Electronics, along with consumer products and retailing, is expected to lead the country out of the recession, the study said. New venture start-ups within both hardware and software continued to emerge during 1982, and overall executive hiring is expected to pick up by mid-year to a rate of 10% to 12% above 1982 for the full year. Korn/Ferry also expects a full recovery to begin during the first quarter of 1984, with senior executive hiring rising 15% to 17% for the year.

The survey noted that the electronics industry is "in the throes of fast-paced change and [is] facing stiff competition," so that, "despite layoffs, electronics and high-technology companies are aggressively recruiting senior-level executives to expand product lines and to direct market diversification." These companies were particularly active in seeking marketing executives to lead them in new directions, Korn added.

The report is based on a quarterly survey of 750 client firms. More information is available from Korn/Ferry at 277 Park Ave., New York, N.Y. 10172.

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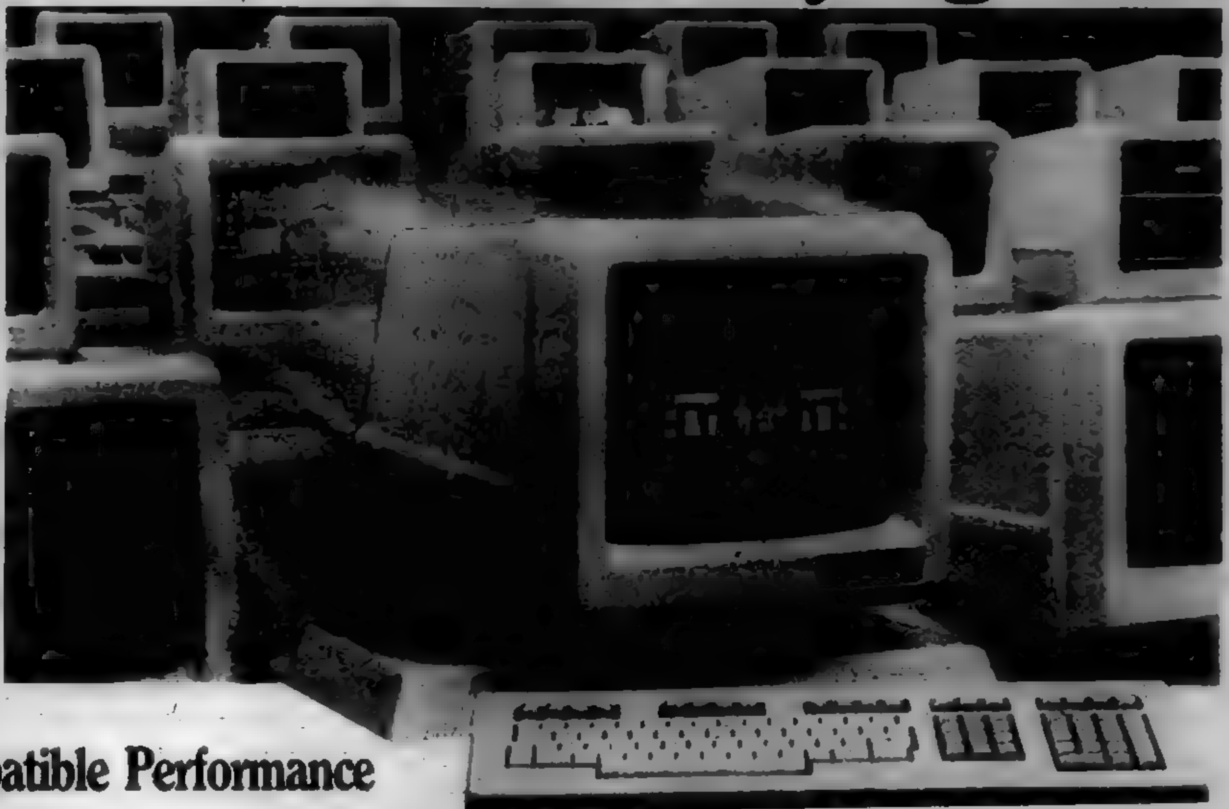

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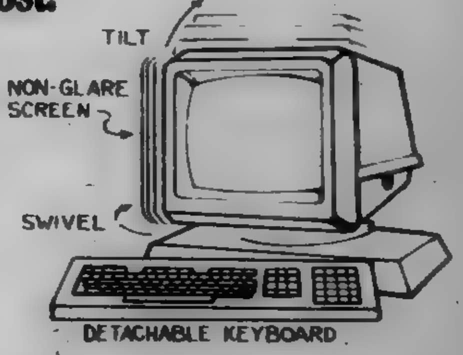

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Fastest Growing Sector

Study: Field Service Thrives

MOUNTAIN VIEW, Calif. — Revenues from computer field service and maintenance are growing faster than revenues for the computer business in general, according to a recent report from Input, Inc.

The "1982 Field Service Annual Report" states that this formerly little-recognized segment of the computer industry now accounts for almost 20% of equipment vendors' revenues. Even more significant, the study said, field service revenues are more resistant to economic declines and make up a more stable contribution to the bottom line.

Vendors will need to adjust to new difficulties caused by the proliferation of microcomputers, the report noted. Their low cost makes on-site visits by field service engineers prohibitive. However, the 306 users interviewed indicated that corporate spending on micros will increase by 60% in 1983, compared to an 8% increase in spending on mainframes.

The study also noted large differences in service pricing for similar equipment. These can be traced to reliability factors, costs of servicing different types of equipment and different approaches to pricing, the study said. However, the field of software maintenance has been seriously underpriced, it continued.

The report costs $5,000 from Input at 1943 Landings Drive, Mountain View, Calif. 94043.

Phone Construction Funds Seen at $15.3 Billion in '83

NEW YORK — The Bell operating companies have projected they will spend $15.3 billion in construction funds this year to expand, improve and maintain communications services.

Additionally, American Bell, Inc., the AT&T subsidiary, will spend about $1,5 billion for various construction programs, making total planned construction expenditures about 2% lower than last year.

Of the $15.3 billion the Bell companies are expected to spend on construction, about 62% is so-called growth dollars, including continued increased in fiber-optic cable placements.

AT&T blamed the decreased spending on several factors. One of these is the effects of the Federal Communications Commission's (FCC) Computer Inquiry II decision, which shifts responsibility for purchasing and providing new customer premises equipment of the operating companies to American Bell as of Jan. 1. American Bell intends to sell rather than lease certain of its customer premises equipment, thereby reducing capital expenditures, the company has predicted.

Further, reducing the construction program is the continuing effect of the FCC's order for Bell companies to charge for station connections, thereby allowing them to recover the costs of new installations at the time work is done rather than capitalizing the costs and recovering them over time, AT&T claimed.

Lastly, construction programs will lag somewhat due to the slower than expected economic recovery.

CDC, MLC Sign Third-Party Pact

MINNEAPOLIS — Control Data Corp. has announced a master agreement with Minneapolis Leasing Corp. (MLC) under which CDC is offering MLC third-party leases to users of CDC's large IBM-compatible peripheral disk storage subsystems. The agreement between the firms calls for CDC to offer standard equipment maintenance to its third-party lease customers.

For example, MLC leases on a CDC 3350X disk drive are available for periods of 24 to 48 months at prices 5% to 15% below current CDC operating leases, depending on subsystem configuration.

According to CDC, users may also qualify for an investment tax credit with the MLC lease, further reducing the lease cost.

Formed last year, MLC has arranged a $50 million line of credit from Citicorp Leasing, Inc. for the purchase and lease of CDC disk systems.

Xerox Program Assists Vendors

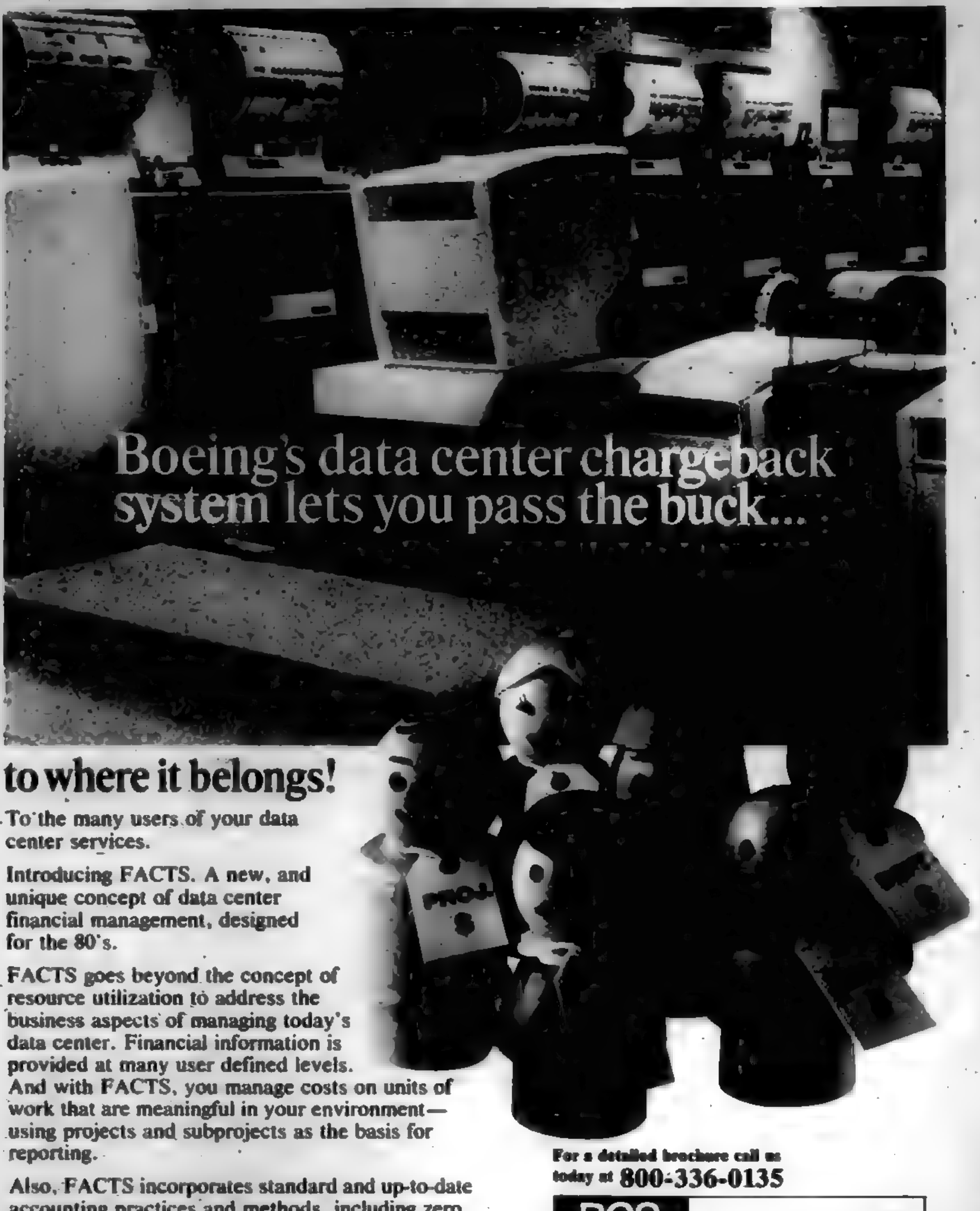
DALLAS — A program encouraging third-party vendors to develop products for use with Xerox Corp. computers has been unveiled by the firm's Office Products Division.

Under the Vendor Involvement Program, the division will assist vendors in marketing developed products through Xerox distribution channels.

The division will select certain products requested by its distribution channels and jointly promote them with the manufacturer.

The division also is planning to publish a program directory listing compatible software and hardware for the company's 820-II personal computer and the availability of services such as custom programming.

Xerox's Office Products Division is located at 1341 W. Mockingbird Lane, Dallas, Texas 75247.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Nickels & Dimes

Promedics Data Corp. has received $1 million in financing through Medical Software Development, a research and development limited partnership.

$ $ $

Cray Research, Inc. has filed a registration statement with the Securities and Exchange Commission covering 750,000 new shares of common stock. The offering will be made through a group of underwriters managed by L.F. Rothschild, Unterberg, Towbin; Rothschild, Inc.; and Piper, Jaffray & Hopewood, Inc.

$ $ $

Dataram Corp. has sold 10% of its stock in **CSP, Inc.**, retaining approximately 21% of the firm's outstanding stock.

$ $ $

Analog Devices Enterprises has invested $500,000 in **Quantitative Technology Corp.** of Portland, Ore., in return for convertible securities.

Hogan Systems, Inc. has completed a public offering of 1.6 million shares of common stock at $21 per share through Hambrecht & Quist and Alex. Brown & Sons.

$ $ $

Analogic Corp. plans to file a registration statement with the Securities and Exchange Commission relating to a proposed offering of approximately 600,000 shares of its common stock.

$ $ $

STC Ultimatic Systems, Inc. and **STC Systems, Inc.**, subsidiaries of **Storage Technology Corp.**, have formed a partnership with private investors to expand the company's turnkey business. Financing was arranged by L.F. Rothschild, Unterberg, Towbin of New York.

$ $ $

Convergent Technologies, Inc. has announced a three-for-two common stock split.

Executive Corner

- James MacGuire has been named president and chief operating officer of Ibis Systems, Inc.
- Velma A. Stewart has been promoted to comptroller of Mallinckrodt, Inc.'s Corporate Administration Division.
- Frank B. Lee has been promoted to vice-president of National CSS, Inc., an information services company of the Dun & Bradstreet Corp.
- David A. Young has been promoted to vice-president, finance and administration, and chief financial officer and Charles E. Butler has been appointed vice-president and general manager of European operations for MSI Data Corp.
- Sidney E. Wing has been promoted to vice-president, business development, at Interstate Electronics Corp.
- Bernard Balter has been named vice-president and general manager of Dataguard, a division of Novo Communications, Inc.
- Joseph Squarzini has been named vice-president and manager, telecommunications and information processing operations, at General Electric Information Services Co., a General Electric Co. subsidiary.

Supershorts

Frost & Sullivan, Inc. will introduce the "Computer Vertical Market Industries Newsletter" in January. The eight-page monthly will analyze selected vertical markets in two consecutive issues, covering such topics as market structure; current and future data processing applications; suppliers and their products; recommended selling, advertising and promotion techniques; industry meetings and publications; and market size and growth projections.

— — —

Kearney-National, Inc. has formed a new subsidiary, Wabash Datatech Australia Pty. Ltd., 25 George St., Homebush, N.S.W., Australia.

— — —

Perkin-Elmer Corp. has established CAD/CAM Operations, a new business unit for the company's Technical Systems Division. The unit will be located at 214 Third Ave., Waltham, Mass., and expects to be operational in early 1983.

— — —

M/A-COM Laboratories will become part of M/A-COM, Inc.'s recently formed M/A-COM Development Corp., Rockville, Md. M/A-COM Laboratories will change its name to M/A-COM Research Center and its director, Dr. L.S. Golding, will continue in his present position in addition to becoming a vice-president of M/A-COM Development Corp.

— — —

Hitek Development, Inc., Los Gatos, Calif., is offering new marketing and management services to U.S. companies wishing to begin operations in Europe. Available services include planning and implementation of advertising, sales, marketing, funding and site selection as well as assistance in executive-level search and joint venture and cross-licensing with European firms.

— — —

American Satellite Co. (ASC) and Mitel Corp. have signed an agreement in principle to form a new U.S. specialized carrier that will combine ASC's satellite transmission capabilities with Mitel's long-distance voice, data, video conferencing and value-added services via satellite to business users. ASC will own 75% of the carrier, Mitel, 25%. Service is expected to begin in early 1984.

— — —

Evans and Sutherland Computer Corp. has donated PS 300 graphics systems to the University of North Carolina, Chapel Hill, N.C.; Lehigh University, Bethlehem, Pa.; University of Illinois, Urbana-Champaign, Ill.; University of California at Los Angeles; University of Wisconsin, Parkside, Wis., and Louisiana State University, Baton Rouge, La.

MCI Forms Subsidiary

WASHINGTON, D.C. — MCI Communications Corp. has formed MCI International, Inc. to manage its international voice and data marketing efforts.

Operating as a wholly owned subsidiary of MCI Communications, MCI International will have two operating companies; MCI International Telecommunications, responsible for implementing the company's international voice marketing strategy; and Western Union International, Inc., which will continue to serve the traditional international record market.

MCI International and MCI International Telecommunications will be headquartered in Rye, N.Y.

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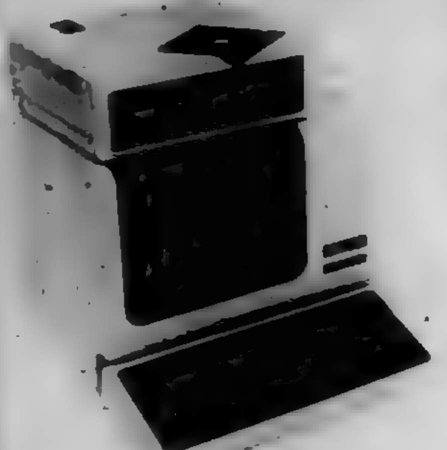

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We've pioneered virtually all the technological breakthroughs in modern, high-performance sorting. Many of our innovations are, in fact, patented.

And recently we introduced SYDOC, an exciting new Structured Documentation System that does away with many of the problems formerly associated with COBOL documentation and maintenance. Other new state-of-the-art software products are standing in the wings waiting to make their debuts.

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SYSTEMS PROGRAMMERS (TECHNICAL SERVICES): You'll investigate complex operating-system and software problems and provide creative solutions for many of America's heavyweight data processors. You need the following experience:

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- Strong BAL programming experience;
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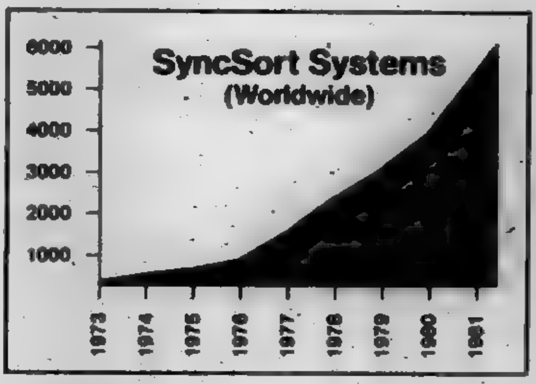
If you'd like to join one of the brightest software teams in the business, please send us a confidential resume, Attention: Wizards Department.



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Dr. Toby S. Berk, Chairperson
Department of Mathematical Sciences
Florida International University
Tamiami Campus, Miami, FL 33199

Applications will be accepted until all the positions are filled. A department representative will attend the ACM Computer Science Conference (Employment Register) in Orlando in February, 1983. FIU is a member of the State University System of Florida and is an Affirmative Action/Equal Opportunity Employer.

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Our state-of-the-art operating environment consists of systems such as multiple 3081's, 4341's, 8100's, 3380's, 3705's, IMS DB/DC, SNA, TSO, VM/CMS, TCAM, VTAM/NCP, MSNF, NCCF and MVS/JES.

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Senior Capacity/ Software Planner	Responsible for participating in evaluations and justifications of software products: contributing to the development of strategic software plans and performing technical analysis to support development of hardware plans. Must also manage the corporate computer network, software portfolio and hardware inventory to insure cost effective data center operations. Candidates should have a minimum of 3 years experience determining computer hardware and software requirements. Should be familiar with MVS and VM/CMS related software products, both internals and overall relationships. Should possess a knowledge of SMF, RMF, MVS tuning techniques and statistical analysis tools. BS degree in a technical discipline is preferred.
Lead Systems Programmer (CICS)	Responsible for installing and maintaining new release of CICS. Opportunity to develop skills in IMS DB/DC. Candidates should have a minimum of three years experience as a CICS Systems Programmer. Experience with CICS applications Programming, TOTAL, and IMS is preferred.
Hardware Analyst	Responsible for physical planning, coordination of hardware installations and upgrades; insuring proper maintenance levels are maintained; identify, isolate, and resolve reported hardware problems; maintain accurate inventory of installed hardware. Candidates should have a minimum of 1 year hardware planning in a large scale IBM environment. 3081 and 3380 experience desirable.
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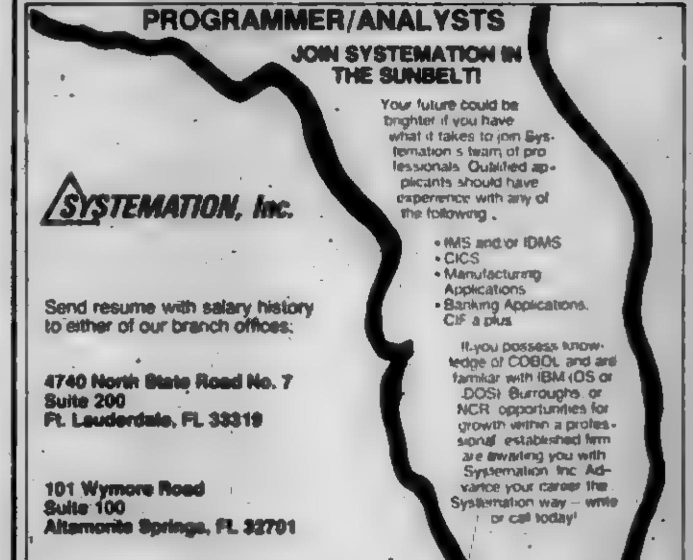
PROGRAMMER/ANALYSTS



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Major Cleveland area employer, a division of a diversified Fortune 200 industry leader, seeks an experienced Systems Programmer to provide technical support and guidance to Engineering and Scientific staff. This challenging position requires BS in Computer Science or equivalent technical experience with 5+ years in scientific programming (minimum 1 year assembly level & 2 years systems programming on VAX).

Successful candidate will be responsible for selection, generation, installation and modification of operating systems and systems level software. You will plan and evaluate new hardware/software; establishing department procedures and standards. Multiple language skills, including FORTRAN 77, are essential. Some supervisory background desirable.

Working in a professional career-oriented environment, you will enjoy top competitive salary and generous company benefits designed to match your current and projected skill level. For immediate and confidential consideration, send your resume with salary requirements to:

CW-B4067, Computerworld, Box 880
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Western Kentucky University invites applications for the Headship effective July 1, 1983. Applicants must hold the Ph.D. in Computer Science or a closely related discipline, have demonstrable administrative ability and experience in and a strong commitment to teaching, public service and scholarly activities. Rank and salary open and dependent upon qualifications and experience. Candidates should submit a letter of application, vitae and three letters of recommendation before March 15, 1983 to the Office of Academic Affairs, Computer Science Headship Search, Western Kentucky University, Bowling Green, KY 42101. A representative will be present at the February ACM conference. An Affirmative Action/Equal Opportunity Employer.

WANTED SNA/SDLC SOFTWARE CONSULTANT

Expanding Northwest Data Communications Company requires Software Consultant with SNA/SDLC experience at the Micro Processor level, preferrably Z-80 based. Send capabilities resume and financial requirements to:

M.G. Bell
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Mercer Island, WA 98040

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The applicants must be trained in COBOL and RPG II. System involving IBM 4300 series interactive National Network Marketing System. Also IBM System 34. Telecommunications a plus. Interested applicants should submit their resume and salary history to

THE AMERICAN BOARD OF TRADE, 9 South William Street, New York, NY, 10004.

COMPUTER SYSTEMS PROGRAMMER for employment in SAUDI ARABIA. Serves with a team of U.S. advisors to Saudi Arabian National Computer Center. Requires extensive experience using MVS operating systems on IBM 370 or 30XX computers. Must be capable of installing, testing, tuning, and evaluating computers, telecommunications systems, utility packages, compilers, software packages, peripheral equipment, etc. U.S. Citizenship required. Family may accompany. Benefits include COLA, free quarters, free automobile, school allowance for dependent children, and much more.

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The Dept. of Justice needs a COMTEN systems programmer to support their 3690s used for front-end processing and message switching. Applicants must have at least 2 years of experience with the internals of 3690 front-end processor software, COMTEN's EXEC90 and CTAM message switching system software and also possess knowledge of the IBM access methods (BTAM, RTAM, VTAM, TCAM) used to support our user community with CMS, CICS, HASP and JES2. Other duties include problem diagnostics, hardware evaluation, acquisition planning and network design. Salary $29,374 - $34,930.
Send an SF 171 to: Wm. T. Deterding, Dept. of Justice, Justice Management Division, Justice Computer Service, Rm. 4003, 425 I Street N.W., Washington, DC 20530. An EOE.

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(312)364-0505
Hartford Technical Services, Inc.
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$850MM Southwestern Indiana bank seeks an experienced individual to head Data Processing subsidiary.

IBM 4341-2 DOS/VSE system currently in use provides batch and on-line services to approximately 30 banks. Center support on-line CIF, ATM, Burroughs, and NCR teller machines, on-line programming, and Proof of Deposit, employing approximately 30 people.

Applicant should have good technical skills, administrative ability and be capable of interfacing with user banks.

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Citizens National Bank
20 N.W. Third Street
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For prompt consideration, please call Gene Ruppel COLLECT at (609) 234-1100. Or forward your resume and salary history/requirements to his attention at: CSC, Defense Systems Division, P.O. Box N, Dept. 1206CW, Moorestown, NJ 08057.

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Data Processing

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SPSS, Inc., is a unique company where employees enjoy a progressive work environment and outstanding benefits, including 4 weeks vacation a year. If you would like to be considered, principals only, please send your resume, including salary requirements, to:

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Individual needed with strong background for manufacturing concern. Language RPG. MAPICS and/or System 38 experience a plus. Require resume and references in addition to application. Please send resume to:

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Personnel Department
5161 Lake Ellenor Drive
Orlando, FL 32809
(305) 858-3350

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A city-owned major medical trauma facility, located in central Texas is seeking a Programmer Analyst. Applicants must have college courses equivalent to an Associate's degree in Data Processing plus three years of progressively responsible business systems programming. Experience in DOS/VSE, CICS/VS and DL-1 is desired. Interested applicants may call or write

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Data Processing

MVS/VM Systems Specialists

Computer Sciences Corporation, System Sciences Division, a leader in providing IBM systems programming support to NASA's Goddard Space Flight Center for the past 12 years, has excellent long range opportunities for MVS/VM specialists. These individuals would join an interdisciplinary team that is assisting in the procurement of multiple **CURRENT** generation IBM PCMs to replace IBM S/360s.

This is an unusual opportunity to be involved with the Orbit and System Support Operation, located in Seabrook, Maryland, in planning for a new system and influencing the system features being procured. The individuals selected for these positions will become the nucleus of a systems programming group that is being established to support the transition to, and operation of, this new facility. Formal, ongoing education and Share/Guide participation will be provided to help individuals maintain current state-of-the-art product awareness.

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Computer Sciences Corporation offers competitive salaries and an excellent benefits program. Interested candidates are invited to forward resumes to Mr. Wayne Ewing, Staffing Department CW-461 or Call TOLL FREE 800-638-0842 or COLLECT (301) 589-1545.

CSC
SYSTEM SCIENCES DIVISION
8728 Colesville Road
Silver Spring, MD 20910

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PROGRAMMER/ ANALYSTS

Our Corporate Data Processing Department, located in Neenah, Wisconsin, is currently expanding and will be looking for several systems professionals. Working in an aggressive MIS organization, you will be able to enhance your professional background while solving business management problems through the development of high level user friendly business systems.

Program development is performed on a Burroughs 1965 dual processor using COBOL in an on-line environment. Qualifications include 3 to 6 years of COBOL programming and systems design experience, preferably manufacturing orientated with a college or technical school business data processing degree. Customer order entry or inventory control systems experience a plus.

We offer a competitive salary and benefits package and opportunities for future growth. Qualified candidates should submit a resume and salary requirements in strictest confidence to:

Corporate Personnel
MENASHA CORPORATION
P O Box 367, Neenah, WI 54956

[illegible]

DATA SYSTEMS
Computer Services Specialist

San Diego City Schools
Salary $30,348 to $38,736

Applications are being accepted for the above managerial position. The position is responsible for planning, organizing, and directing city schools' student records section in the data processing department. Successful candidate will possess: Combination of training and experience equivalent to Bachelor's degree in Information Systems, Business, Public Administration, Education, or related field; experience in a large scale computer environment; and considerable supervisory experience. Experience with automated student records systems is required. Submit detailed resume to:

Personnel Administration Department
San Diego City Schools
4100 Normal Street
San Diego, CA 92103
(619) 293-8152

Application materials and position description will be provided to applicants for completion and return. Must receive application or resume by 2-7-83

PROGRAMMER ANALYST

Our growing data processing department is looking for an IBM System 38 programmer with well-rounded background in manufacturing applications. The programming involves the design of new applications and maintenance to diverse existing applications (MAPICS and in-house).

Applicants should have 2 years MAPICS experience with a minimum of 5 years in programming.

Interested applicants should please send a resume, stating current salary, to Mr. Tom Bugden, Personnel Administrator, Kontron, Inc., 9 Plymouth Street, Everett, MA 02149. An equal opportunity employer.

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DATA PROCESSING MANAGER

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Our requirements include an undergraduate degree with at least seven years experience which should include a proven record of Project Leader and management capabilities. Experience with an NCR VRX environment as well as Data Base and Data Communications skills is preferred.

For confidential consideration for this position, please submit your resume and compensation history to:

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Computerworld
Box 880
Framingham, MA 01701

Systems Analyst

The City of Gainesville, Florida has an opening for a Systems Analyst with experience in financial applications. The successful candidate will possess strong planning and analytical skills and will participate in the design of an integrated financial information system in an interactive DEC computer system environment. Qualifications include a 4 year degree plus 4 years experience in a related field or any combination of education and experience. Send your resume with salary requirements by 5 pm, February 7, 1983 to **City of Gainesville, Personnel Department, P.O Box 490, Gainesville, FL 32602.**

Mini Computer Technical Mgr: Supervises 2-5 programmer consultants in system generation & design, functional specs, coding, testing, & all implementation phases of all projects. Resolves problems, writes flow charts, codes, tests & modifies programs. Analyzes, reviews & rewrites programs for increased efficiency or to adapt to new requirements. Computes all documentation. Must possess solid background using NEC Computer as well as a variety of hardware & software: PDP, DEC, IBM, BASIC, & FORTRAN. Must have a BS in computer science & at least 1 yr exp. in computer technical mgmt. 40 hrs wk. 3-5. $27,500 yr. Send resumes to Box CW 800, 810 7th Ave. NYC 10019

Senior Systems Analyst

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Successful applicant will be responsible for research laboratory computers and overall computer support to research department. To qualify, you must have at least 3 years experience with a solid understanding of PDP II and Apple II computers. Knowledge of FORTRAN, BASIC and Pascal are pluses.

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Fortune 500 mfg. division based in **City of Industry, CA** is seeking an aggressive self starter to be responsible for all programming to develop a complete manufacturing system on an IBM S/38 with minor conversion of systems currently installed on IBM S/3.

Minimum of one year RPG II experience on a S/3 or S/34 required. College degree and S/38 experience a plus but not required. Excellent programming skills are most important.

High visibility and career oriented position. Excellent benefits. Salary commensurate with experience.

Send resume to

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City of Industry, Ca 91749

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Director of Computing Services
State University College at Fredonia
Fredonia, New York 14063

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SYSTEM ANALYST MASS. DIVISION OF HAZARDOUS WASTE

To be responsible for supervising the operation of Hazardous Waste Manifest Tracking System and COBOL Programming on an IBM 370 DOS/VS and Accounting Using IBM's Development Management System (DMS/CICS/US)

Qualifications: Four years of professional experience in computer programming or systems analysis. Educational substitutions may be permitted. Salary: $19,167 - 25,269

Application must be submitted by January 26, 1983 to Luke G. Contos, DEQE/DHW, One Winter Street, 8th Floor, Boston, MA 02108

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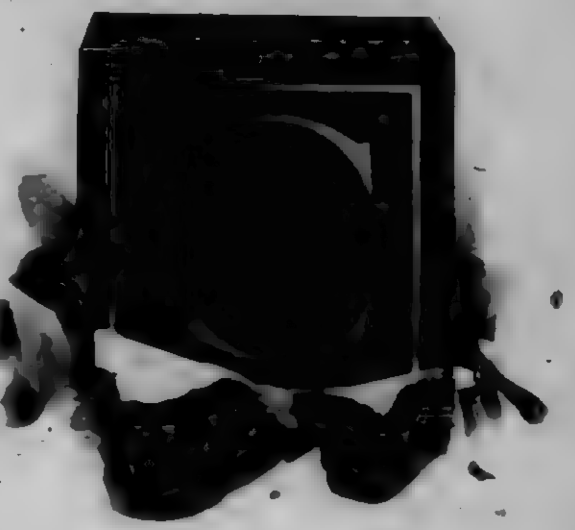

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The Boston Company, an American Express company, and recognized leader in the financial industry has immediate openings for qualified technicians at our new Data Center. Our hardware includes a 3081, a 3033, and 3380's. Our major software components include MVS/SP, JES2, ACF/VTAM, and ADABAS.

MVS SYSTEMS PROGRAMMER

Responsibilities include the installation, maintenance and tuning of the operating system and other program products. The successsful candidate will possess 2-5 years experience as an MVS systems programmer with a strong background in BAL and SMP4. Experience in a multi-CPU shared DASD environment is a plus.

DATA BASE ADMINISTRATOR

Responsibilities include ADABAS software maintenance, assisting with data base design, and security and recovery procedures. The ideal candidate will have excellent interpersonal skills and prior experience with large data bases. Knowledge of ADAMINT or NATURAL is a plus.

Resumes are to be forwarded to J. Cellana, Employment Manager, THE BOSTON COMPANY, One Boston Place, Boston, MA 02106.

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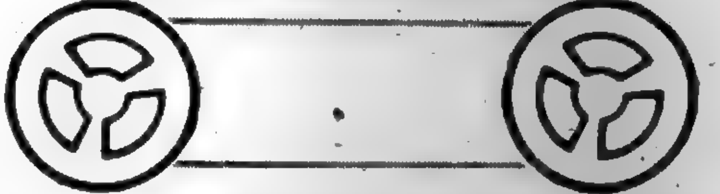

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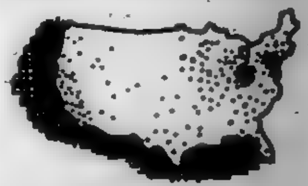

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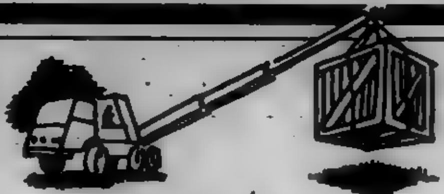

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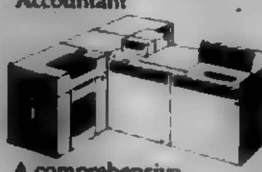

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COMPUTERWORLD's

Classified Pages.

ADVERTISERS INDEX

Access Technology	88
Aluminum Case Co.	45
Applied Computer Research	64
Applied Data Research	3,ID/13
Applied Software	46
Artificial Intelligence	9
B.I. Moyle & Associates	72
Boeing Computer Services	90
Centronics	27
Cincom Systems, Inc.	78
Circle Computer Services, Inc.	50
CMI Corporation	40
Comdata	51
ComDesign	41
Computer Associates	5
Computer Consoles	66-67
Computer Devices	28-29
Computer Language	22
Computer Management Research	83
Computer & Terminal Exchange	13
Computerworld	ID/1
Computerworld Supplement	72
Compuware	42
Cord Cable Co.	ID/7
CRWTH	33
Data General/Field Engineering	ID/14
Data Management	64
Datamation	48
Dataroyal	ID/12
Datascan America	24
Datasouth Computer Corp.	26
Deltak	49
Digilog	92
Digital Associates	12
Digital Equipment Corp/ —Field Service	11
Digital Equipment Corp/ —NPM Peripherals	32
Digital Equipment Corp/ —Small Systems Group	84-85
Digital Equipment Corp/ —Terminal Group	71
Digital Research	ID/10
Dorlen Products	80
Dysan Corporation	19
Eastman Kodak Co.	25
Emulex Corporation	70
Falco Data Products	118
Fibronics	6
Florida Computer Graphics	30
Foresight	54
Future Software	ID/6
Gejac, Inc.	41
General Research Corporation	43
Graham Magnetics	81
Group Operations	77
Hewlett Packard	14-15
Hughes Aircraft	ID/4
Human Designed Systems	35
H & W Computer Systems	50
ICCP	64
Infodata	91
Innovative Electronics	48
Interface Group	56
Invitational Computer Conference	24
Lear Siegler	87
Lee Data Corp.	ID/16
Maxell Corp. of America	52-53
MCBA	38
MicroAge	20
Microterm	31
Mini & Micro Educational	29
MPC	89
Multiplications	17
National Computer Comm. Corp	92
NCR/OEM Division	74-75
Newcorp Products	68
Newman Computer	77
Omni Offices	82
Otrona Corporation	69
Pace Applied Technology	18
Personnel Data Systems, Inc.	ID/3
Phillips Info Systems/MICOM	55
Popcom	ID/13
Printek	89
Quality Micro Systems	33
Ram-Tek	65
Rolm Corporation	ID/7
SAS Institute	43,ID/8-ID/9
Saturn Systems	73
S & H Computer	23
Signal Technology, Inc.	64
Software Technology & Res.	39
Solutions, Inc.	23
SPSS, Inc.	82-83
Stratus Computer	ID/15
Synapse Computer	76
Syncsort	7
Tandem Computers	57-/62
T & B Computing	41
Technalysis	18
Tech. Products, Inc.	55
Technology Transfer Institute	16
Televideo Systems	20-21
Telex Computer	54
Thomas Engineering	8
Tominy, Inc.	86
Tone Software Corp.	50
Transnet Corporation	41
Ungermann-Bass	68
University Computing Co.	44-45
VM Software, Inc.	47
Walker Interactive Products	34
Wolfe Computers	62
Xerox Corporation	ID/11

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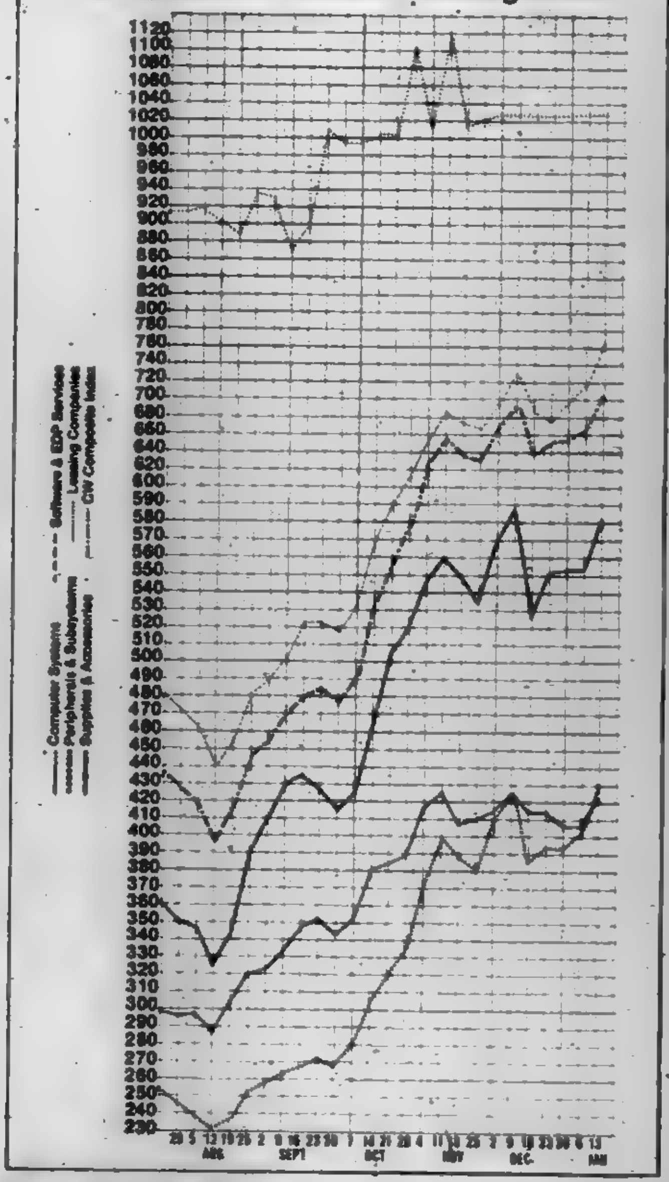
Computerworld Stock Trading Index



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CLOSING PRICES WEDNESDAY, JANUARY 12, 1983

All statistics compiled, computed and formatted by
TRADE QUOTES INC
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1982-83 RANGE (1)	CLOSE JAN 12 1983	WEEK NET CHANGE	WEEK PCT CHANGE
A	AMDAHL CORP	17- 39	32	+2 3/8	+8.0
N	BURROUGHS CORP	28- 48	45 5/8	+4	+9.6
O	COMPUTER AUTOMATION	7- 17	14 1/4	+ 1/8	+0.8
N	CONTROL DATA CORP	21- 42	39 3/4	+2	+5.2
N	CRAY RESEARCH INC	20- 45	38 1/2	+2	+5.3
N	DATA GENERAL CORP	20- 50	44 3/4	+4 3/4	+11.8
N	DATAPOINT CORP	11- 34	18 3/8	+1 3/8	+7.6
N	DIGITAL EQUIPMENT	62-113	98	+4 3/4	+5.0
A	EECO INC	6- 11	10	+1 1/4	+14.2
N	ELECTRONIC ASSOC.	5- 12	11 3/8	+1 5/8	+16.6
N	FLOATING POINT SYST	16- 30	26 3/8	+1	+3.9
N	FOXBORO	22- 40	40	+4 5/8	+13.0
O	FULCRUM CORP GRP	1- 3	1/4	0	0.0
O	GENERAL AUTOMATION	3- 8	5 5/8	- 1/8	-2.1
N	HARRIS CORP	20- 42	41 1/8	+4 3/8	+11.8
N	HEWLETT-PACKARD CO	38- 82	77	+4	+5.4
N	HONEYWELL INC	60-104	92 1/4	+8 5/8	+10.3
N	IBM	48- 98	98 1/8	+2 1/8	+2.2
O	IPL SYSTEMS INC	5- 9	6 1/4	+ 1/4	+4.1
O	MAGNUSON COMP SYSTS	2- 10	2 3/8	- 5/8	-18.5
N	MANAGEMENT ASSIST	7- 18	12 3/8	+ 5/8	+5.3
O	MINI-COMPUTER SYST	1- 4	3/8	- 1/4	-40.0
N	MODULAR COMPUTER SYS	6- 13	11 1/4	- 3/8	-3.2
N	MOHAWK DATA SCI	10- 18	15 3/4	+ 7/8	+5.8
N	NCR	38- 85	81 1/2	+6	+8.5
N	PERKIN-ELMER	17- 32	29 5/8	+2 3/8	+8.7
N	PRIME COMPUTER INC	16- 40	40	+4 5/8	+13.0
N	SPERRY CORP	21- 37	34 1/4	+1 1/4	+3.7
O	TANDEM COMPUTERS INC	14- 34	25 7/8	+1 3/4	+7.2
N	TEXAS INSTRUMENTS	71-151	139 3/8	+6 5/8	+5.1
A	WANG LABS "B"	13- 39	39	+5	+15.6
A	WANG LABS "C"	11- 34	33 1/2	+4 1/8	+14.0

LEASING COMPANIES

EXCH		1982-83 RANGE (1)	CLOSE JAN 12 1983	WEEK NET CHANGE	WEEK PCT CHANGE
O	BOOTHE FINANCIAL CP	22- 30	29 1/2	+2 3/4	+10.2
N	COMDISCO INC	13- 40	40	+5 7/8	+17.2
O	COMMERCE GROUP CORP	1- 1	1/4	0	0.0
O	COMPUTER INVSTRS GRP	1- 2	3/8	0	0.0
O	CONTINENTAL INFO SYS	9- 20	14 1/2	+2 1/2	+20.8
N	DPF INC	9- 13	9	- 1/8	-1.3
O	ITEL	1- 3	7/8	- 5/8	-41.6
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	18- 37	37	+2	+5.7

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH; B=BOSTON
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SOFTWARE & EDP SERVICES

EXCH		1982-83 RANGE (1)	CLOSE JAN 12 1983	WEEK NET CHANGE	WEEK PCT CHANGE
O	ADVANCED COMP TECH	1- 6	3 1/2	+1 1/4	+55.5
O	ADVANCED SYSTEMS INC	8- 19	19 1/4	+ 1/2	+2.6
O	AGS COMPUTERS INC	7- 17	15 1/2	+ 3/4	+5.0
N	ANACOMP INC	8- 18	15 7/8	+1	+6.7
O	ANALYSTS INTL CORP	5- 9	8	+ 1/2	+6.6
A	APPLIED DATA RES.	16- 42	38 3/4	+1 1/8	+2.9
O	ASK COMPUTER SYSTEMS	12- 27	24 3/8	+1 3/8	+5.9
O	ASTRADYNE COMP IND	1- 3	2 7/8	+ 1/8	+4.5
N	AUTOMATIC DATA PROC	21- 38	37 1/2	+2	+5.6
O	CGA COMPUTER ASSOC	8- 10	9 3/4	+1 1/4	+14.7
O	COMPUTER ASSOC INT'L	12- 38	37 1/2	+3 3/4	+11.1
O	COMPUTER HORIZONS	1- 9	8 1/8	+2 1/2	+37.0
O	COMPUTER NETWORK	4- 8	7 5/8	+ 1/4	+3.3
N	COMPUTER SCIENCES	11- 20	17 3/8	- 7/8	-4.7
O	COMPUTER TASK GROUP	8- 18	17	+1 1/4	+7.9
O	COMPUTER USAGE	2- 7	6 1/4	+ 3/4	+13.6
O	COMPUTONE SYSTEMS	13- 30	28 3/4	- 1/8	-0.4
O	COMSERV CORP	11- 20	15	-1 1/4	-7.6
O	COMSHARE	6- 10	6 7/8	- 1/8	-1.7
N	CULLINANE DATABASE	12- 27	27 1/4	+2 7/8	+11.7
O	CYCARE SYSTEMS INC	9- 18	14 1/4	0	0.0
O	DATA DIMENSIONS INC	1- 3	1/4	0	0.0
O	DATATAB	0- 1	5/8	0	0.0
O	DYATRON CORP	2- 4	3	- 1/8	-4.0
N	ELECTRONIC DATA SYST	19- 50	45 7/8	+2	+4.4
O	INFORMATICS INC	10- 24	20	- 3/4	-3.6
O	INSYTE CORP	1- 3	2 1/4	+ 3/8	+20.0
O	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	4- 8	6 1/4	- 1/4	-3.8
A	LOGICON	12- 28	28 3/4	- 1/8	-0.4
O	MNGT SCI AMER INC	8- 24	23 3/4	+5	+26.6
O	MATHEMATICA INC	12- 19	18 1/4	+4 1/4	+28.3
O	MATHEMATICAL APP GRP	17- 18	18	0	0.0
O	NATIONAL DATA CORP	13- 28	18 3/8	-3 3/8	-15.7
O	PANSOPHIC SYSTEMS	6- 20	19	+2	+11.7
N	PLANNING RESEARCH	8- 11	11	+1	+10.0
O	PROGRAMMING & SYS	1- 3	2 7/8	0	0.0
O	REYNOLDS & REYNOLD	17- 34	33 3/4	+2 3/4	+8.8
O	SEI CORP	21- 49	42	+3 1/2	+9.0
O	SHARED MEDICAL SYST	25- 55	52 1/4	-1 1/8	-2.1
O	SCIENTIFIC COMPUTERS	6- 13	11	0	0.0
O	SOFTWARE AG	5- 17	10 1/8	- 3/8	-3.9
N	TYMSHARE INC	12- 30	20 1/2	+2 1/8	+11.5
A	UPS CORP	10- 17	16 7/8	+1 7/8	+12.5
N	WYLY CORP	7- 13	9 3/4	+ 1/2	+5.4

PERIPHERALS & SUBSYSTEMS

EXCH		1982-83 RANGE (1)	CLOSE JAN 12 1983	WEEK NET CHANGE	WEEK PCT CHANGE
N	AM INTERNATIONAL	1- 18	2 1/2	+ 1/4	+11.1
A	ANDERSON JACOBSON	5- 28	23 3/8	+3 3/4	+19.1
O	AUTO-TROL TECHNOLOGY	8- 18	16 1/2	+2 1/4	+15.7
O	BANCTEC INC	7- 33	18 3/8	+3 3/8	+22.5
A	BEEHIVE INT'L	4- 8	6 7/8	- 1/8	-2.7
A	BOLT,BERANEK & NEW	9- 34	31 5/8	+ 1/8	+0.3
O	CAMBEX CORP	2- 4	3 1/4	- 1/8	-5.2
N	CENTRONICS DATA CORP	6- 17	13	- 1/4	-1.8
A	CETEC CORP	4- 6	5 1/8	+ 3/8	+11.2
O	COGNITRONICS	2- 11	10 1/8	+3 1/2	+52.8
O	COMPUTER CONSUL.	1- 2	3/4	0	0.0
A	COMPUTER CONSOLES	15- 40	40 1/4	+4 1/8	+14.4
O	COMPUTER DEVICES INC	4- 21	13 3/8	+1 1/2	+12.6
O	COMPUTER TRANSCEIVER	4- 8	7 5/8	+1 3/8	+22.0
N	COMPUTERVISION CORP	18- 38	32 3/8	+1	+3.1
N	CONRAC CORP	21- 36	32	- 1/2	-1.5
A	DATA ACCESS SYSTEMS	2- 5	1	0	0.0
A	DATAPRODUCTS CORP	16- 38	34 1/4	- 1/4	-0.7
A	DATARAM CORP	9- 10	9 5/8	+ 1/8	+1.3
O	DATUM INC	3- 6	5 7/8	+ 3/8	+6.8
O	DAVID JAMIESON CARLYL	2- 7	4 1/8	- 1/2	-10.8
O	DECISION DATA COMPUT	3- 14	11 3/8	+ 3/4	+7.0
O	DELTA DATA SYSTEMS	1- 3	2 3/8	0	0.0
N	ELECTRONIC M & R	3- 8	8 3/4	+ 3/8	+5.0
O	EVANS & SUTHERLAND	18- 48	44	+ 1/2	+1.1
O	GANDALF TECHNOLOGIES	10- 22	16 1/4	-1	-5.7
N	GEN'L DATA COMM IND	6- 18	18	+1 1/2	+9.0
O	GENERAL TERMINAL CP	0- 4	3/8	+ 1/8	+50.0
O	GREAT SOUTHWEST IND	2- 8	3	0	0.0
N	HAZELTINE CORP	22- 43	38 1/4	- 1/8	-0.3
O	ICOT CORP	3- 8	7	- 3/8	-5.0
O	INFORMATION INTL INC	10- 22	18	- 3/4	-3.7
O	INTEL CORP	21- 43	42 3/4	+4 3/4	+12.9
O	IPL SYSTEMS INC	5- 9	6 1/4	+ 1/4	+4.1
A	LUNDY ELECTRONICS	7- 14	12 3/4	+ 7/8	+7.3
A	MSI DATA CORP	14- 38	35 1/2	+6 1/2	+22.4
O	NETWORK SYSTEMS CORP	13- 42	38 3/4	+4 3/8	+12.5
O	OMEX	2- 8	3	0	0.0
N	PARADYNE CORP	24- 50	40 3/8	+2 1/2	+6.6
A	PENRIL CORP	7- 12	10	+ 1/8	+1.2
O	QANTEX CORP	12- 20	17 3/4	+2 1/4	+14.5
N	RECOGNITION EQUIP	4- 11	11 3/8	+2 1/4	+24.6
O	SCAN DATA	1- 3	1 1/4	0	0.0
N	STORAGE TECHNOLOGY	16- 40	23 3/4	+2 3/8	+11.1
O	SYKES DATATRONICS	6- 34	11 3/4	+ 3/8	+3.2
A	T BAR INC	7- 11	9 3/4	+ 3/8	+4.0
A	TEC INC	4- 12	9 1/4	- 3/8	-3.8
N	TEKTRONIX INC	34- 63	62 1/2	+2 3/4	+4.6
N	TELEX	5- 27	22 3/4	+1	+4.5
O	TESDATA SYSTEMS CP	3- 10	7 1/4	+ 7/8	+13.7
A	TIMEPLEX INC	7- 22	22 1/8	+4	+21.6
O	VISUAL TECHNOLOGY	8- 17	15 3/4	+ 1/2	+3.2
O	WILTEK INC	1- 3	1 7/8	0	0.0

SUPPLIES & ACCESSORIES

EXCH		1982-83 RANGE (1)	CLOSE JAN 12 1983	WEEK NET CHANGE	WEEK PCT CHANGE
N	AMERICAN BUS PRODS	11- 18	18 3/8	+1 1/2	+8.6
O	BALTIMORE BUS FORMS	1- 2	1 1/4	0	0.0
N	BARRY WRIGHT	13- 22	20 1/4	+1	+5.1
O	CYBERMATICS INC	1- 1	7/8	0	0.0
A	DUPLEX PRODUCTS INC	12- 20	18 3/8	+1 1/8	+6.5
N	ENNIS BUS. FORMS	18- 30	29	-1	-3.3
N	3M COMPANY	48- 78	78 5/8	+5 5/8	+7.7
N	MOORE CORP LTD	28- 44	43 3/8	+2 3/8	+5.7
N	NASHUA CORP	9- 19	11 1/8	+ 1/2	+4.7
O	STANDARD REGISTER	32- 72	66	-2 1/2	-3.6
A	TAB PRODUCTS CO	12- 28	28 5/8	+3 3/4	+15.0
N	WALLACE BUS FORMS	22- 30	27 1/2	+1 1/4	+5.7

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- VT-100 Emulation
- VT-52 Emulation
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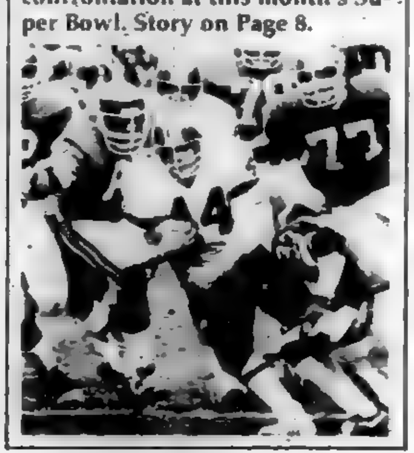
Wide World Photos

Miami Dolphins fullback Woody Bennett (34 in photo above) and Washington Redskins running back John Riggins (44 below) plow through their opponents' defenses in recent games. Bud Goode and his computer think both teams are charging toward a confrontation at this month's Super Bowl. Story on Page 8.



Apple, NCR Heat Up Micro Action

•Apple: Into the Office

By Jeffry Beeler
CW West Coast Bureau

CUPERTINO, Calif. — Apple Computer, Inc. last week plunged headfirst into the office systems arena with the introduction of a 16-bit microcomputer that reportedly allows users to run several applications simultaneously.

Apple's long-awaited Lisa system made its formal debut during the company's annual shareholders meeting, where the firm also announced the Apple IIE, an enhanced version of its existing Apple II (story on Page 10).

Lisa, aimed at business professionals and corporate executives, comes with six integrated application software packages that reside together in a 5M-byte hard disk system, Apple said. The software packages include:

- Lisa-Calc, an electronic spreadsheet.
- Lisa-Write, a word processing program.
- Lisa-Graph, which allows spreadsheet data to be converted into bar, line, pie and other charts.
- Lisa-Draw, which allows users to prepare presentation graphics and to produce line drawings, schematics and other visual aids.
- Lisa-List, a data base facility.
- Lisa-Project, which aids in project management, scheduling and modeling.

(Continued on Page 10)

DEC Running Into Problems?

By Jim Bartimo
CW Staff

Digital Equipment Corp. has begun to ship its much-heralded Professional line of personal computers, announced last May, but end users should not necessarily expect immediate software delivery.

According to industry sources, DEC is running into trouble delivering a spreadsheet package and an adequate word processing package.

However, a spokesman at DEC's headquarters in Maynard, Mass., said Visicorp's Visicalc spreadsheet package will be available in March and a full-capability WP package has been

(Continued on Page 7)

•NCR: Into the Fray

By Ed Scannell
CW Staff

SAN FRANCISCO — NCR Corp. became another prospector in the personal computer gold rush last week when it took the wraps off its first two low-cost microcomputers as well as a local-area network that links the systems with the IBM Personal Computer and Apple Computer, Inc.'s Apple II. All products are scheduled for June delivery.

Intended for business-oriented applications, the two systems that make up NCR's new Decision Mate V series include an 8-bit, Zilog, Inc. Z80A-based system and an 8/16-bit, Z80A- and Intel Corp. 8088-based system. Both run under the Digital Research, Inc. CP/M and Microsoft, Inc. MS-DOS operating systems. The systems are compatible with several higher level languages, including Cobol and Pascal.

A unique feature of the two Decision Mate systems, NCR claimed, is the ability to add peripherals without opening the cabinet. A spokesman said external plugs permit users to add subsystems, including a diagnostic module that locates faults, to the units' backplanes.

At $2,800, the 8-bit system's basic configuration consists of two 512K-byte floppy disk drives, 64K bytes of main memory, a 12-in. CRT, detachable keyboard with 20 programmable function keys, an operating system and a bit-map graphics subsystem that contains its own processor and memory.

The 8/16-bit computer, which carries a $3.340 price tag, has the same basic configuration as the 8-bit system with the addition of the 8088 chip.

(Continued on Page 6)

American Bell Unwraps Digital PBX

By Bruce Hoard
CW Staff

NEW YORK — Saying "let there be no doubt about it, we in AIS are off and running," Archie J. McGill, president of American Bell, Inc.'s Advanced Information Systems division, finally took the wraps off American Bell's digital private branch exchange here last week.

Besides unveiling the Dimension AIS/System 85, the new company's first significant commercial product offering, American Bell also introduced a series of AIS/System 85-compatible terminals.

McGill described the 300- to 900-line, 19.2K bit/sec digital PBX as "an integrated systems package." The primary users of System 85, which features voice, data, office and building management applications, are expected to be medium-size to large organizations.

McGill noted that System 85 is an enhanced version of earlier Dimension models with several digital features not found in its forerunners, which offered analog-only transmission. The Dimension line was introduced in 1975; since then, more than 40,000 units have been shipped.

Robert Casale, AIS group vice-president, stressed the compatibility of System 85 with those models. "System 85 was developed to dovetail with the Dimension PBX, not replace it," he declared, adding that American Bell will continue to market and manufacture analog PBXs.

The System 85 building and office management capabilities are also available on other Dimension models, McGill added.

Available by "midyear" on a lease-only basis, the PBX, which has also been known as "Antelope," runs over twisted-pair wiring at potential speeds up to 64K bit/sec, he said.

An "average" 600-line configuration will cost $12,500/mo on a lease basis; "with all the bells and whistles," that same configuration would cost around $15,000/mo, according

(Continued on Page 4)

IBM Again Enticing 3080 Users To Buy Rather Than Lease CPUs

By Susan Blakeney
CW Staff

IBM has devised yet another plan to encourage lessees of its 3080 series of mainframes and related hardware to buy its equipment.

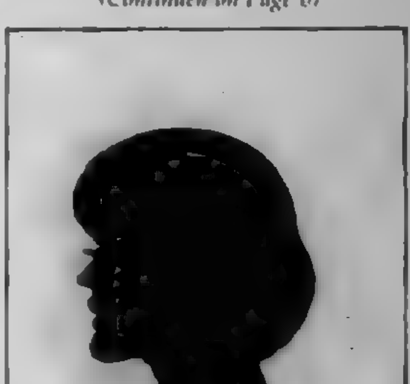
Effective April 1, the purchase option percentages of the high-end 3081, 3083 and 3084 mainframes, the 3082 controller, the 3087 coolant distribution unit and the 3089 power unit will drop from the present 40% to 20%, prodding lessees either to buy before the April deadline or consequently to take longer to reach the maximum accrual percentage.

The percentage drop means that lessees of the 8M-byte 3083 processor — at the low end of the 3080 spectrum — will lose approximately $9,350/mo in accrual dollars, according to Jack Hart, an industry analyst with International Data Corp. in Framingham, Mass.

At the high end, lessees of the 32M-byte 3081K processor will lose roughly $36,000/mo toward the machine's purchase, he said.

The maximum accrual that lessees can apply toward a purchase is 50% of a machine's price, he added.

(Continued on Page 10)



CW Illustration

Computer-generated brain 'maps' may someday provide researchers with ways to help people with multiple personalities like Natasha, a woman with 127 personalities. Story on Page 14.

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New York: Suite 7G, 401 East 80th St., New York, N.Y. 10021. Phone (212) 570-2135.

West Coast: 257 Lytton Ave., Palo Alto, Calif. 94301. Phone (415) 328-5064.

Washington, D.C.: 880 National Press Building, 529 14th St. N.W., Washington, D.C. 20045. Phone (202) 347-6718.

England: Bill Dunlop, Stephen Thomas, [illegible] Assoc., [illegible] Cowell Rd., Islington, London EC1V [illegible]. Phone 01-278 [illegible].

W. Germany: Eckhard Utpadel, CW Publikationen, [illegible] 8000 Munich [illegible]. Phone (089) [illegible]. Telex [illegible].

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Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone (02) [illegible]. Telex [illegible].

Brazil: Eric Hippeau, Data News, Computerworld do Brasil, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25/10th Floor, 20031 Rio de Janeiro, RJ Brazil. Phone (021) [illegible]. Telex [illegible].

Mexico: Richard Shaw, Computerworld de Mexico, Oaxaca 21-2, Colonia Roma, Mexico City 7, D.F. Phone (905) 514-4218, (905) 514-6309.

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Houston Dropped as NCC '84 Site

By Bill Laberis
CW Staff

ARLINGTON, Va. — Due to a combination of inadequate facilities, sultry weather and diesel fumes, Houston has been axed as the 1984 National Computer Conference site.

That decision, reached recently by the conference organizers, the American Federation of Information Processing Societies, Inc. (Afips) here, brings up the questions of where — and when — NCC '84 will be held.

At press time last week, Afips directors were reportedly close to choosing among admittedly limited options. The Las Vegas Convention Center or McCormick Place in Chicago, site of NCC '81, are likely places. However, there is some question about the availability of either facility for the dates the industry's principal show has traditionally been held, mid-May to early June.

Although Afips had not released an official statement on the matter by presstime last week, it is widely believed that complaints from scores of vendors who were at NCC '82 in Houston cast the die for Afips' cancellation in that city.

The trade show coordinator at Shugart Associates in Sunnyvale, Calif., last August carefully itemized what company officials claimed were appalling conditions of the Houston show last year. Three pages worth of complaints and criticisms were mailed both to Afips officials and to nearly 700 exhibitors at NCC '82. The exhibitors were asked to return signed copies of the criticisms, stating they "fully agree with the attached concerns of the NCC Exhibitor' letter to Afips."

Included in the litany of complaints and criticisms were:

- The heat and humidity pervasive in the Gulf region in June, where attendees "experienced temperatures as high as 95 degrees with humidity ranging from 85% to 91%."
- An exhibit hall (the Astrohall) in "grave disrepair" with uneven floors, ceiling restrictions and, in general, "an atmosphere not conducive to successful business dealings."
- Hotels spread over a 500 square-mile radius, "combined with the city's infamous traffic problems."
- Housing which was in "questionable neighborhoods and unclean rooms in obvious disrepair."

The Shugart letter also complained of the presence of diesel and other noxious fumes that supposedly streamed into the non-air-conditioned exhibit areas during set up times.

Shugart officials said that one-third of the exhibitors, representing some 100,000 square feet of exhibit space, supported the letter.

The cost to Houston-area businesses of Afips' cancellation will be in the $40 million to $50 million range. Attendance at NCC is rapidly approaching the 100,000 mark.

Afips noted there is no change in NCC '83, which will be held May 16-19 in Anaheim, Calif.

Imlay to Keynote NCC '83

ANAHEIM, Calif. — John P. Imlay Jr., chairman of the board and chief executive officer of Management Science America, Inc. (MSA), will keynote the 1983 National Computer Conference (NCC '83), which is scheduled to take place here May 16-19.

The theme of NCC '83 is "The Emerging Information Age: Computers, Communications and People." Imlay will focus on software as the key factor in human involvement in the future of personal computers.

John P. Imlay Jr.

Imlay joined MSA in 1968 after holding marketing and management posts at Sperry Univac and Honeywell, Inc. He was named chief executive officer in 1970; since then it has become a $73.1 million software company.

Further details about NCC registration are available from Afips headquarters at 1815 North Lynn St., Arlington, Va. 22209.

AWC Meet Slated for May 15

ANAHEIM, Calif. — The Association for Women in Computing (AWC) will hold its Second Annual National Conference here May 15, concurrent with the National Computer Conference.

The AWC conference on "Women Emerging With the Information Age" will address the subjects of women in top management, entrepreneurs and technologies in the forefront during the '80s.

Registration costs $30. Details are available from AWC Program Vice-President Virginia Walker, 2813 N. Kensington St., Arlington, Va. 22207.

This Week

IN DEPTH
DOS to MVS .... Follows Page 26

NEWS
AT&T Brings 10,000 Circuits Back to Earth 4
Survey Finds DP Salaries Up 6.5% This Year 6
Cortex Unveils Tools to Expedite VAX Cycles 8
McCormack & Dodge Updates Hilite Version 9
Apple IIE Announced 10
Promotion 'No Surprise' to Education Director 11
Immigration Bill Reintroduction Considered 12
First Beta Test User Lauds Kontact for 'Smarts' 13
Multiple Personalities 'Mapped' by Computer 14
How Can We Help You? Senate Asks Vendor 15
NSF Calls for National Supercomputer Effort 16
Communications Chiefs Seen Under Gun 18
N.Y. Bank Trying New Ways to Fire Up DPers 19
No Recession for This DPer 21
Stanford Gets Top Grade in Grad School Poll 22
Trace Package Helping to Teach Assembly 24
Off the Press 26

EDITORIAL
Editorial: In Search of a Measure 34
Lecht on Science: Rebundling — Here to Stay 35
Human Connection: Collegians Not Worried 35

SOFTWARE & SERVICES
Bank DP Service Firm Weathers Change 37
'Sourcemanager,' 'Designmanager' Announced 38
VCI Adds SMF Link, Dasd to Billing System 39
DEC, Softool Unveil VAX Facility 40
Data Service Converts System/34 to /38 42
IEEE Approves Test Documentation Standard 44
Mega System's DDS Gets Graphics Module 46
ARA Data Base Announced 48

COMMUNICATIONS
Choosing Local Net Focus of Users' Seminar 51
Efficient Local-Area Nets to Grow: Consultant 52
Fiber-Optic Links Created for Pronet Systems 53
IBM Micro Gets Tool for Modem 57

SYSTEMS & PERIPHERALS
CDC Ups Cyber Line, Cuts Memory Prices 59
Utility First User of 3380-Like System 60
Microcomputers Impacting Storage, Report Says 62
Genrad Unwraps CAD Net Unit 64

OFFICE AUTOMATION
NCR Boosts Worksaver; Offers Graphics Aid 71
DEC-Compatible Tools Repriced 72

COMPUTER INDUSTRY
National Semi Acquires POS Terminal Maker 73
Wang Promotes Top Managers 73
Memorex Buys Into DMA 74
DG Guilty of Fraud, Must Pay $86,000 to OEM 75
Plessey, Scientific-Atlanta Enter Joint Venture 76
Commodore to Use Z8000 Family in Its Micros 77
ACT Sells Services Subsidiary 78
HP Establishes Personal Computer Group 79
Hardware Makers Form NS16000 Users Group 81

ADVERTISING INDEX 106

U.S.A.

1972: SyncSort was used by 2%.
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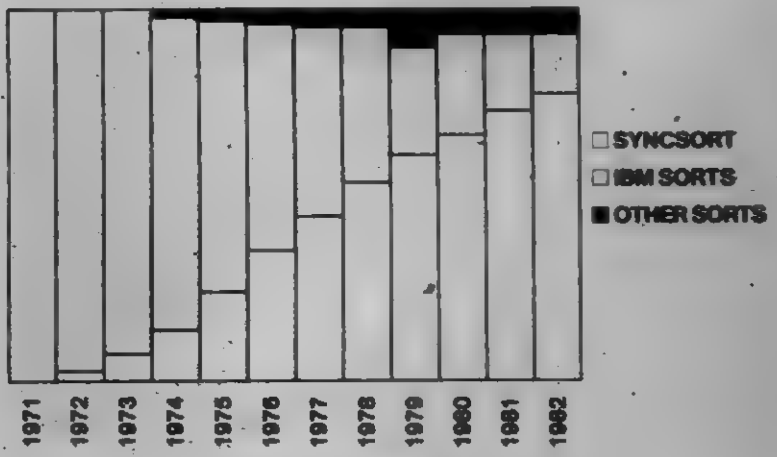

PERCENT OF USERS IN THE U.S.*

Sort Used	1982	1980	1978
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IBM	19%	25%	42%
Other	6%	6%	4%

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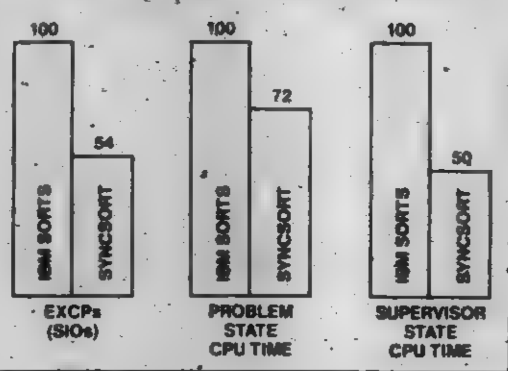

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*According to IDC's Sixth Annual Survey of Sort Programs Used in IBM OS and OS VS Environments.

User Complaints 'a Consideration'

AT&T Brings 10,000 Circuits Back to Earth

By Phil Hirsch
CW Washington Bureau

BASKING RIDGE, N.J. — Admitting that complaints from communications users were "a consideration," AT&T has transferred about 10,000 interstate dial-up circuits from satellite to terrestrial transmission facilities.

The move, which began quietly in late 1981, was made "primarily" to make room for high-speed wideband services, an AT&T spokesman here said last week.

Users have complained about problems stemming from the long propagation delay inherent in satellite transmission [CW, April 26, Sept. 7]. When half-duplex satellite circuits are used for interactive applications, the modems at the extremities of the message path must be adjusted accordingly — by allowing more "turnaround time" for the units to change from send mode to receive mode and vice versa. However, this increase does reduce throughput across the circuit.

User Must Adjust for Satellite

Because the user cannot tell whether a particular transmission will be routed over a satellite or terrestrial path, he must adjust his modem for satellite transmission and put up with the loss of efficiency.

Whatever the reason for AT&T's decision to make the circuit transfer, it may help at least some users. Based on figures supplied by AT&T, it appears that the transfer has reduced significantly the probability that a Message Toll Service/Wats user will be routed over a satellite channel. (Shortly after the transfers began in late 1981, the chances of a circuit being routed over a satellite channel were about one in 20; at the present time, the chances are about one in 35.)

About 12,250 dial-up circuits beginning and terminating within the continental U.S. still pass through satellite transponders, compared with 22,600 a year ago, according to AT&T spokesman Brian Wood. Whether and how quickly additional circuits will be transferred depends on the demand for the wideband television and data services that displaced these circuits, added AT&T Division Marketing Manager G. W. Phipps.

It Won't Do Anything for Independents

Most Bell 201- and 202-compatible modems include a switch that enables the user to configure the equipment for satellite or terrestrial circuit operation. For the past couple of years, however, independent modem makers have been complaining about the difficulty of making their equipment communicate with Western Electric Co. modems over satellite circuits.

The basic problem is that Western Electric insists on charging a license fee for its modem turnaround timing specifications, explained Thomas L. Thompson, a vice-president of General Datacomm Industries, Inc. in Danbury, Conn., a leading independent modem maker. His company, as well as others, refuses to pay.

Pointing out that national telecommunications policy is based on the promotion of universal service, these companies argue that AT&T, as the setter of de facto standards, should make the timing information available free, particularly since it relates only to the communications protocol with which the parties at either end of the circuit must comply in order to communicate. The timing information does not relate to the design of the equipment.

AT&T's decision to bring several thousand dial-up circuits down to earth does not really alleviate the problem, Thompson said, because General Datacomm and other independents must still design their modems to operate over both satellite and terrestrial circuits. AT&T, by comparison, knows what modem each of its customers is using and, therefore, has the capability to build equipment specifically for one type of service or the other, assign a different class of service to users of each and route them automatically over the most appropriate transmission path.

Thompson also pointed out that AT&T can change its turnaround timing specifications for terrestrial and/or satellite circuits at will, without disclosing that information to anyone else. A change like that would seriously disadvantage the phone company's competitors, he said, because it would prevent users of independently made modems from communicating with users of Western Electric modems, while not disturbing communications within the latter group.

Digital PBX Unveiled by American Bell

(Continued from Page 1)

to an American Bell spokesman.

The electronic office capability introduced with System 85 is known as Electronic Document Communications. It reportedly allows office workers to prepare, store, send, receive and manage documents.

It also offers a Basic language feature and allows users to create forms, track personal schedules, arrange meetings and maintain tickler files, according to a company spokesman.

The sensor-based energy and security management feature receives and evaluates real-time data and implements customer-programmable and preprogrammed strategies for managing building facilities.

Networking Capabilities

System 85 provides networking capabilities by interfacing with existing electronic tandem, data and local-area networks. Through its Electronic Tandem Networking, it reportedly reduces costs by automatically routing calls over the most economical path and monitoring individual telephone calling privileges.

The digital communications pro-data and control information into a single high-speed digital transmission stream. The applications processor introduced for Dimension models last May allows System 85 to emulate an IBM 3270 cluster controller, a Teletype Co. Model 33/55 keyboard send/receive teleprinter or an IBM 2780/3780 remote job entry workstation.

The 16-bit microprocessor in the applications processor runs on a modified Unix operating system. It is said to be fully compatible wih Dimension Feature Package 8 Issue 3, thus allowing a common user interface and the capability to mix Dimension and System 85 in various network configurations and electronic mail networks.

Easy Expandability

The American Bell spokesman said the system architecture permits easy expandability through hardware and software additions and lets users reconfigure the system to their needs.

The PBX was developed entirely by Bell Laboratories, Inc. engineers who have subsequently moved to American Bell. With the exception of the hard disk drive, it was manufactured entirely by Western Electric.

The 7000 series of terminals, also introduced here last week, provide access to the office and data capabilities of System 85. Some of them support simultaneous access to voice and data services.

Certain 7000 series terminals are not compatible with earlier Dimension models, the American Bell spokesman noted.

The 7000 series terminals are available under lease or purchase terms and range in price from $735 to $1,500 for purchase and $5.50 to $21 when leased.

CW Photo by B. Hoard

"Let there be no doubt about it, we in AIS are off and running," Archie J. McGill said last week as American Bell introduced its long-awaited digital private branch exchange.

Analyst Says System 85 Provides Security for Dimension Users

"It may be a theoretical security blanket for an awful lot of Dimension users out there."

That observation was made last week by Kenneth Bosomworth, president of International Resource Development, Inc., during an evaluation of the Dimension AIS/System 85 private branch exchange (PBX) from American Bell, Inc.

System 85 provides security to Dimension users, Bosomworth said, because it ensures continuity and upgradability, qualities they were afraid would not come with the much-ballyhooed PBX. American Bell "may not even expect to ship many of them [the System 85s]."

Bosomworth cited System 85's multiplexing capabilities as critical elements of the overall package. The basic principle is to multiplex a number of slow-speed terminal data streams over "one or two or five" of the paths through the main switch.

In so doing, the problem of "blocking," or port congestion, is alleviated, allowing more users to place calls, he said. Like most PBXs, the System 85 is inherently nonblocking, Bosomworth added.

The PBX may be best used by medium-size to large organizations that have no near-term plans for the installation of coaxial cable-based baseband and broadband local-area networks, Bosomworth said.

Bosomworth sees no great advantage to the digital — as opposed to analog — nature of System 85: "The average user really doesn't know the difference."

John Malone, president of the Eastern Management Group, a Morris Plains, N.J., market research and consulting company, believes there will be no serious demand for System 85 and other third-generation PBXs until around 1985. "Internally, AT&T undoubtedly felt that they had to put a stop to all the badmouthing that was going on around the industry about the geriatric situation of the Dimension PBX itself," Malone said.

Victor Kreuger, Dataquest, Inc. vice-president of telecommunications industry service, lauded the American Bell PBX for its systems approach. "The system consists not just of the PBX, but terminals that go with it to perform a variety of office functions," he observed.

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Survey Finds DP Salaries Up 6.5% This Year

By Bruce Hoard
CW Staff

NEW YORK — Salaries for developers of DP education curricula are up 9.6% over last year, and overall DP salaries are 6.5% higher than a year ago, according to the latest nationwide Robert Half International, Inc. salary survey.

The study is based on analyses of thousands of position requests that employers submitted to the 75 U.S. Robert Half offices. It covers large, medium-size and small DP installations, several job categories are listed independent of installation size

In order to determine the size of an installation, the firm considered a combination of hardware (CPU only) and the professional management staff (management, analysts and programmers). The hardware is judged by the size of the mainframe; the professional staff is judged mostly by the number employed: Large is over 50, medium is 15 to 49 and small is under 15.

Developers of DP education curricula registered the biggest salary gains among DPers, jumping from a $22,000 to $30,000 range to $24,000 to $33,000. Data base administrators in large installations were second, moving from a $26,500 to $33,000 range to $29,000 to $36,000.

By contrast, control analysts within operations departments at small installations received the lowest salary increases — 1.9%. That moved them from the $12,000 to $14,500 range to $12,000 to $15,000.

Besides receiving the smallest salary hikes, the small organizations' operations control analysts also receive the lowest salaries, the study noted.

Management information systems (MIS) directors at large installations were found to earn the highest DP salaries, bringing in between $49,000 and $70,000. They realized a healthy 8.2% salary increase over last year.

Other DPers who realized big salary gains in terms of percentage were operations shift supervisors in large organizations (a 9.1% gain, $21,000 to $27,000 range), systems programmers in large installations (8.8%, $26,000 to $36,000), DP audit managers in medium installations (8.6%, $28,000 to $35,000) and telecommunications specialists in medium installations (8.5%, $21,000 to $30,000).

Following MIS directors in terms of total salary were software development product managers who, the study claimed, are making between $40,000 and $60,000. Consulting managers earn $40,000 to $55,000 and technical support managers make $35,000 to $40,000.

"Employees with the same title and with the same size company may be started at significantly different salaries based upon their technical and applications exposure," the survey noted. "This has to be weighed on an individual basis."

The study went on to point out that DP salaries do not appear to show much growth when compared with the cost of living index, calling that "an illusion" because DPers are often promoted rapidly, but not with the frequency of financial personnel.

The survey is available free of charge from Robert Half International, 522 Fifth Ave., New York, N.Y. 10036.

NCR Adds Two Micros, Local-Area Net

(Continued from Page 1)

Christened Decision Net, the local-area networking system announced by NCR last week supports up to 63 users simultaneously and costs $500 per connection. It is based around Corvus Systems, Inc.'s 1M bit/sec Omninet local-area network with the addition of a vendor-developed file sharer called Modus.

Decision Net is the first offered by a major manufacturer to support systems by several manufacturers, according to Don Coleman, NCR's vice-president of development and production.

The Modus file sharer offers file security as well as the ability to share records, files, programs and messages among computers. The file sharer has an on-board random-access memory, 5¼-in. floppy disk, a Winchester disk that holds up to 96M bytes and an optional streaming tape drive for backup.

In conjunction with the NCR unveilings, Gary Kildall, president of Digital Research, announced his firm has signed software licensing agreements with NCR that will see Digital Research providing NCR with its CP/M Plus and Concurrent CP/M operating systems.

An NCR spokesman said this agreement will provide Decision Mate V users with "hundreds of off-the-shelf application programs and a range of software tools and languages."

Further information about the products can be obtained from NCR at 1700 S. Patterson Blvd., Dayton, Ohio 45479.

Observers See NCR Making Defensive Move

More than a few industry analysts see NCR Corp.'s late entry into the microcomputer market as a defensive maneuver designed to protect its customer base from the established vendors.

NCR's foray into personal computing "seems to be a move designed to strengthen their customer base rather than an offensive move to gain market share," notes Aaron Goldberg, industry analyst at International Data Corp. (IDC) in Framingham, Mass.

But Don Coleman, NCR's vice-president of development and production, disagreed, contending that the newly introduced Decision Mate microcomputers represent an aggressive attempt to gain market share. "We are going after a major market share — major meaning we would like to be in the top five or six [manufacturers]," Coleman said.

Even if NCR does market the systems aggressively, many observers feel the mainframe and minicomputer manufacturer's move into the microcomputer market is too little too late.

"Unless the product has some remarkable attributes, I don't believe NCR has a broad enough market presence outside the retail industry and a couple of other areas to distribute a microcomputer product. Despite their size, they will have to fight for distribution with the other 250 microcomputer manufacturers," observed Ken Bosomworth, president of International Resource Development, Inc. of Norwalk, Conn.

NCR's Coleman also refuted this assessment, pointing out that NCR is putting together a dealer network to complement its direct sales force. The dealer network is designed to reach small businesses while the direct sales force will deal with large accounts.

NBS Offers Proceedings

WASHINGTON, D.C. — The National Bureau of Standards is offering the proceedings from its recently held "Data Base Directions" workshop. The workshop was co-sponsored by the Association for Computing Machinery.

Called *Data Base Directions: Information Resource Management — Strategies and Tools* (SP 500-92) the proceedings include an investigation into how federal and private industry managers can evaluate, select and use tools to manage information resources. The workshop paid special attention to the importance of data dictionaries in data base management.

The proceedings cost $6.50 and can be ordered from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Correction

In "One of First 'System W' Users Looked for Ease of Use, Training," [CW, Jan. 10], Neil Williamson was quoted as saying that one of the decision support systems with which his firm's users had problems because of the "complexity of the language" was FCS-EPS from EPS, Inc. The product to which he was actually referring is FCS from Financial Computer Services, Ltd., which is not the same package as EPS, Inc.'s FCS-EPS offering.

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DEC Running Into Problems?

(Continued from Page 1)

added to the already available advanced editor. But, a second DEC spokesman added, users who want the full-capability package have to make a hardware change.

A full line of software is available for the Professional 325 and 350, the first spokesman maintained. However, a DP manager who was scheduled to be one of Professional series' first users cancelled his order, citing a lack of software for the system.

Jason O'Neil, director of information services for *The Boston Globe*, "sat down [at the computer] at three different occasions at Decus," the DEC users group meeting held recently in California. Although he was satisfied with the hardware, "I called and canceled my order."

Why? "There's no Visicalc," O'Neil said. "When we ordered [the Professional micro] in November, DEC said delivery was imminent."

In fact, "the libraries of software won't be there for six months, and IBM is going to eat that market up. We went right out and bought three IBM [Personal Computers] and I'm glad we did, because if IBM becomes the standard — look out."

The first DEC spokesman said Visicalc will be available for the Professional micros in March, after it has run through DEC's internal testing. "The [testing] program holds things up a little, but we're just trying to protect the customer and the third-party software company."

A Visicorp spokesman confirmed that Visicalc would be available for the DEC micros "in the spring," but would not be more specific.

Computer retailer Barry Passen, president of Microcon Software Center, Inc. in Watertown, Mass., confirmed that much of the Professional software is not yet available. "Most of the major software products are due out in a few weeks, but right now there isn't much software for the Professionals," he said.

One of the developers of the original Visicalc had a reassuring message last week for users who have ordered the Professional micros.

"A lot of people have been getting real worried, but they should look at the other machines, like the Apple Computer, Inc. Apple II and the IBM," said Daniel Bricklin, chairman of the board at Software Arts, Inc. in Wellesley, Mass., who pointed out that a great deal of software was not available for either of those machines when they were first shipped.

"Canceling the order because there is no software isn't smart if you're already sold on the machine," Bricklin added. "If after [the micro] has been available for six months and there's not even demonstration software, then there's a problem."

Besides noting that Visicalc is not yet available for the Professional series, *The Boston Globe*'s O'Neil complained that Prose, the word processing package for the micros, is too slow in some of its functions.

The second DEC spokesman noted that Select, which has "full word processing capabilities for the Professionals," is now available. However, he noted that users have to add an 8-bit processor card to run Select.

DEC Denies Hardware Late, Too

The apparent delay in software for the Digital Equipment Corp. Professional series of microcomputers comes on the heels of what some industry observers said has been a delay in hardware shipments.

But a DEC spokesman last week denied reports of a major production snafu causing delays. "The Professional series shipped in late November and early December. We planned to get it out in that time frame. We've had several thousand revenue shipments," he said.

However, Don Brown, a vice-president at Shearson/American Express, Inc., maintained that "they're six weeks behind in shipments" because "their original production schedule is six weeks late."

"My reaction is that this would have an effect on sales, but [DEC's] official company position is that it won't." Despite the delay, industry analyst Brown said, "I'm pleased as punch that it is where it is. My conclusion is that DEC will be successful in selling through terminal dealers, authorized OEMs and systems houses."

Brown did not include retailers and mass merchandisers in his forecast "because I'm not predicting they'll be successful in that channel."

Asked about the delay in Professional shipments, Adolf F. "Sonny" Monosson, president of American Computer Group, Inc., a DEC distributor in Boston, replied. "Why should these DEC products be any different than any other DEC products? When they announced the original VAX, there were delays. They're not like IBM, who announces just before delivery."

Monosson himself has received no shipments of Professional micros, although a spokesman for Computerland, the chain of computer retail stores, said he has received shipments of the DEC machine.

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Application Development Aids Fit VAX, PDP

By Lois Paul
CW Staff

WELLESLEY, Mass. — Cortex Corp. has unveiled a set of three application development tools designed to expedite all phases of the software development cycle for Digital Equipment Corp. VAX-11 superminicomputers running under VAX VMS and PDP-11 minicomputers running under the RSX-11M, RSX-11M + and IAS operating systems.

The three tools announced by the vendor are the Cortex Application Factory, the Cortex Application Builder and the Cortex Application Accelerator.

- The Cortex Application Factory reportedly works in conjunction with the Application Builder, a fourth-generation language, to develop business applications. It includes standard procedures, such as menu screens, and standard mechanisms for using them, such as a table for menu items, which the designer can fill in interactively.

The Factory adds the ability to specify modules interactively. The software is intended to ensure that a generated module is consistent with other modules according to a vendor spokesman.

- The Cortex Application Builder has evolved from Inform, the vendor's fourth-generation application development language. It reportedly consolidates, integrates and coordinates functions that include screen handling, report generation and applications programming into a single system.

Works With 'Factory'

The Application Builder works in conjunction with Factory, which generates modules written in Builder that are to be executed by Builder. According to Cortex, programmers can use Builder to add special purpose procedures to an application produced by Factory.

Throughout development, Builder and Factory are intended to accelerate progress and to tailor the resulting application to the exact needs of its users through the use of prototypes, Cortex noted.

- The Cortex Application Accelerator boosts the runtime speed of resulting applications by transforming Builder and Factory program modules into DEC Macro assembler programs, which are then assembled into computer object code, Cortex said.

Facilitates Central Development

The Accelerator is said to also facilitate central development of computer applications distributed to multiple sites. Once the application is operational, Accelerator generates task images to run target sites so smaller machines can be used without sacrificing efficiency, the vendor said.

The Accelerator generates tasks that execute on VAX superminis under VMS and on DEC PDP-11 systems under RSX-11M and RSX-11M +. The processors reportedly do not require any Cortex development tools but do require the presence of the Cortex Data Handler for operation.

The three Cortex application development packages sold together will be available in the second quarter of 1983 for $49,500. Separately, the development packages will range in price from $15,000 to $25,000 each, according to the spokesman. Additional information can be obtained from Cortex, located at 55 William St., Wellesley, Mass. 02181.

Fearless 1106 Predicts Super Bowl

Goode Calls It: Dolphins By a Whisker

By Bruce Hoard
CW Staff

LOS ANGELES — "Based on an objective analysis and a weighted equation of all the key stats, the numbers say Miami by a short edge over Washington."

If that lingo sounds familiar to you, it should. Bud Goode, body surfer, former aide to Groucho Marx and dauntless pigskin prognosticator is talking it again.

This year, because of *Computerworld*'s weekly schedule and the succession of National Football League play-off games leading without pause to Superbowl XVII, CW asked Goode to pick the American Football Conference (AFC) and National Football Conference (NFC) winners in addition to the Superbowl champs. The man who sells weekly 80-page computerized readouts to several National Football League head coaches responded to the challenge courageously: Miami over New York, Washington over Dallas and finally, for all the marbles, the Dolphins over the Redskins in Pasadena Jan. 30.

'A Dismal Science'

One needs only to consult today's sports page to verify Goode's AFC-NFC championship calls. If he was right, he's happy. If not, well, he only calls 'em as his Sperry Univac 1106 sees 'em. In his own words, "It's a dismal science."

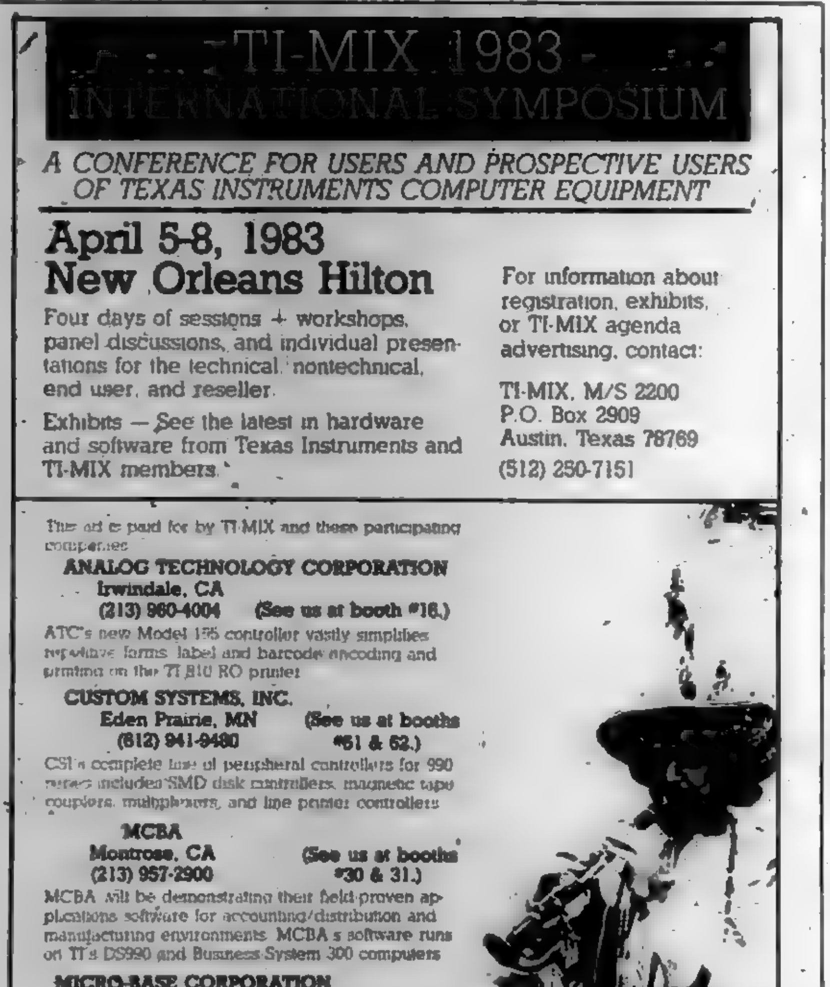
Here's the Goode Superbowl XVII scenario: Two very tight games will be decided by the home field advantage, which is worth three points in the play-offs.

Goode made his picks based only on hard, cold numbers. If the Cowboys lived up to their stats, they should have scored 24.75 points ("of course, that fourth decimal figure is a crock,") and given up 19.91, leaving them with a positive figure of 4.84. By the same token, the Redskins should have scored 22.31 and given up 16.41, giving them a positive figure of 5.90.

"It looks like Washington without a home field advantage is 5.9 points better than their opposition, while Dallas is only 4.84. Now I add between two and three points for the home field advantage and I've got Washington by two to three points," he said.

Applying the same criteria to the Jets-Dolphins tilt, he came out with Miami as a one-point favorite.

So what happens if and when Miami meets Washington in Pasadena? Goode was reluctant to discuss the final battle before the semifinals were concluded. Too much room for statistical variance, too many unpredictable human foibles. Just Miami over Washington.



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Siggraph Wants Award Choices

DETROIT — The Association for Computing Machinery's Special Interest Group on Computer Graphics (Siggraph) is accepting nominations for two newly established special recognition awards. The awards will be presented here on July 25, during the opening session of Siggraph '83, the 10th annual Conference on Computer Graphics and Interactive Techniques.

The Steven Anson Coons Award for Outstanding Creative Contribution to Computer Graphics has been established to recognize an individual's long-term creative impact upon the computer graphics field. A $1,500 cash prize will be awarded.

The Computer Graphics Achievement Award carries a $500 cash prize and recognizes significant recent accomplishments of an individual in computer graphics. Areas of accomplishment to be considered when selecting this award recipient will encompass both theory and application. It will include, but not be limited to, works of art, algorithms and hardware designs.

Nominations for the awards should include why the person is being nominated, a professional biography and bibliography and the nominator's name, address and telephone number. They should be sent by March 1 to Jon Meads, Awards Chairman, 2516 N.E. 19th Ave., Portland, Ore. 97212.

GML Guide Covers Micro Offerings

LEXINGTON, Mass. — There are more than 800 microcomputers now on the market, according to the recently published "Microcomputer Review," from GML Corp., a reference text that covers commercial offerings ranging in price from $99 to $50,000 from some 325 companies.

The guide includes business microcomputers, process control units, scientific/engineering systems, personal computers, word processing micros, military systems and special applications microcomputers. It contains product reviews that list hardware characteristics, interfacing, packaging, communications, peripherals and software support.

Annual subscription to the 500-page loose-leaf review costs $175. Further details can be obtained from GML at 594 Marrett Road, Lexington, Mass. 02173.

McCormack & Dodge Updates Query System

NEEDHAM HEIGHTS, Mass. — McCormack & Dodge Corp. has released Hilite 2.0, which it called a completely revamped version of the on-line query system for its financial packages. Hilite 2.0, which runs on IBM and plug-compatible CICS systems, is also the first application to come-out under McCormack & Dodge's Advanced Financial Systems development methodology (story below).

The major enhancements to Hilite include a linking feature that allows an accountant to follow audit trails of current and historical activity across individual McCormack & Dodge data bases. For example, a user can follow an expense account from the General Ledger system through invoices in Accounts Payable to authorizing purchase orders in the purchasing system, the vendor explained.

Another facility added to Hilite reportedly enables end users to create their own screens, which can display one or many records on the terminal at a time.

In addition, Hilite 2.0 includes an on-line documentation feature that users can access via a single Help key on the keyboard. A McCormack & Dodge spokesman noted that this documentation feature is available for each field on the screen and/or each error message. Users also can add to or modify the documentation to meet their specific needs, the spokesman said..

Hilite 2.0 also features user-determined search fields, amount totaling and subtotaling, enhanced security and a "wild-card" capability that allows users to query information when only part of the identification is known (for example, EMPLOYNUM=3??5).

Hilite 2.0 is priced at $15,000 for the first application and $5,000 for each additional application, the McCormack & Dodge spokesman said. The enhanced facility is free to current Hilite users who are under the maintenance contract. McCormack & Dodge is located at 560 Hillside Ave., Needham Heights, Mass. 02194.

'Hilite 2.0' the First Application of AFS

By Lois Paul
CW Staff

NEEDHAM HEIGHTS, Mass. — Version 2.0 of Hilite, announced recently by McCormack & Dodge Corp., is the first application of Advanced Financial Systems (AFS), a design methodology that McCormack & Dodge is using to develop on-line real-time functions for its existing applications as well as new applications.

AFS applications will be a reality for McCormack & Dodge users in 1983, according to John Landry, vice-president of research and development. "We will probably replace, functionally, all the on-line facilities we currently have on the system. We will be releasing Fixed Assets, General Ledger, Accounts Payable, Purchasing, Payroll and Personnel — all on-line functions under the control of AFS," Landry said, stressing that this will not involve additional cost to users of these packages.

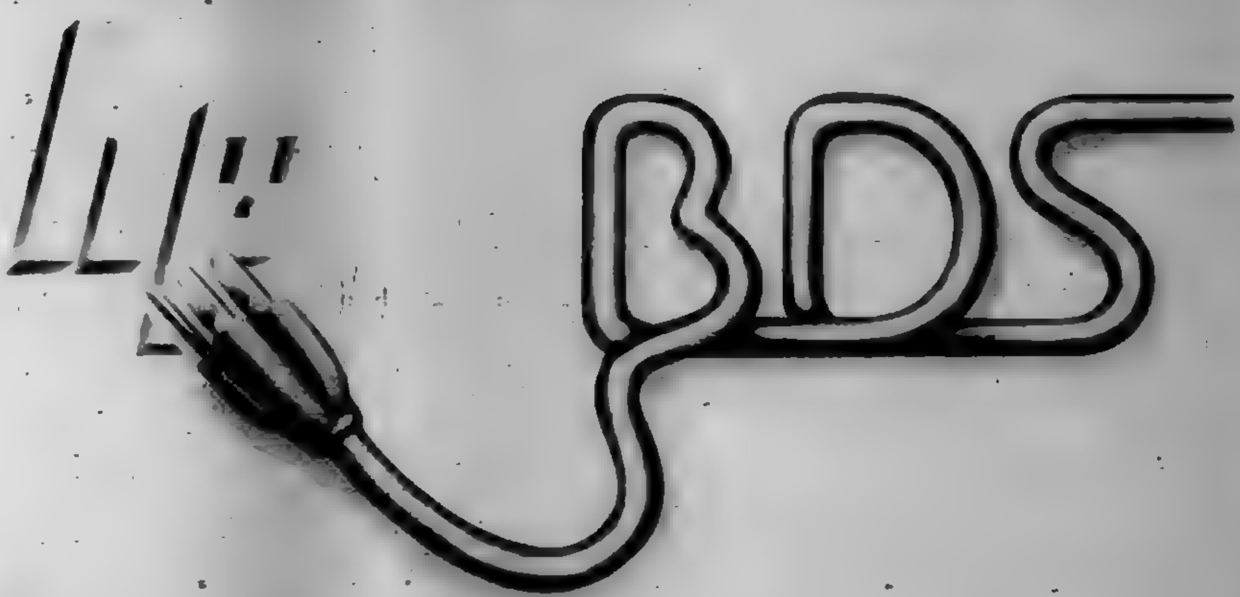
Also, if a General Ledger package user decides to add the Accounts Payable package, McCormack & Dodge will only have to deliver a data dictionary, high-level language procedures and screens.. "He will load all data into his AFS control file and be ready to process payables with no impact on the DP staff whatsoever," Landry said.

CW Photo by P. Gilin

AFS gave McCormack & Dodge 'the opportunity not to be required to develop a system, just to develop technology which we could then reuse in building systems,' said John Landry, vice-president of research and development.

This points to what the vendor feels will be a major impact of AFS — the ability to enhance its packages much faster than in the past.

"AFS is an outgrowth of what Hilite started out to be. We keyed in on selection as being the key component of on-line systems," Landry said. "What we were trying to do is create a very consistent way of defining files. Hilite is an application of AFS because it uses AFS techniques to build the information it needs to do queries and to store queries.



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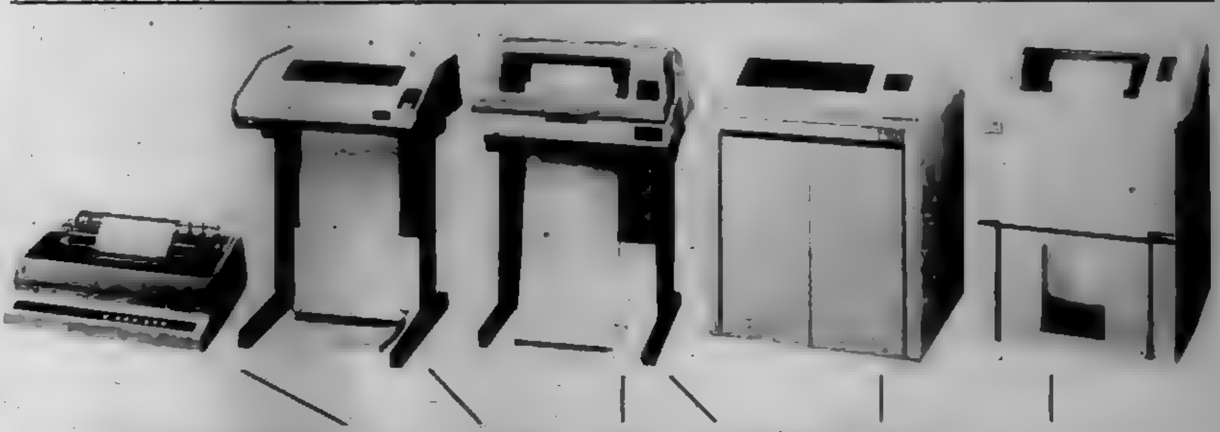

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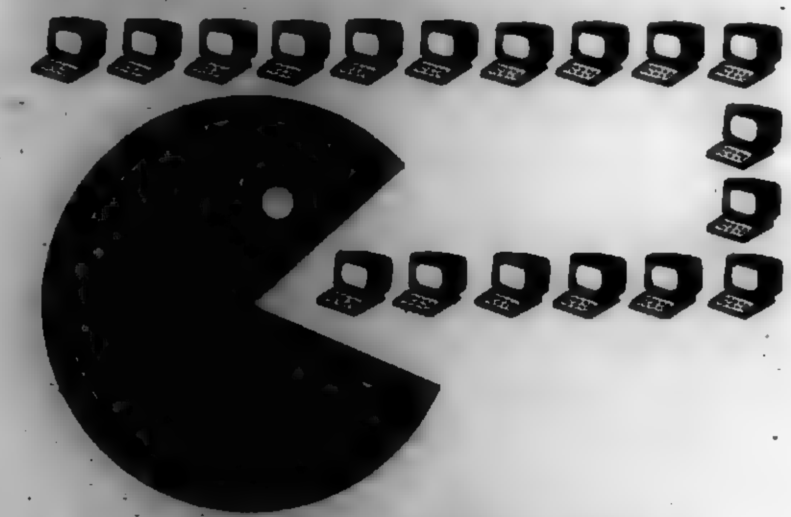

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Apple Enters Office Arena

(Continued from Page 1)

Several of these applications or their associated documents can be displayed on the system's 12-in. screen simultaneously, and users can switch at will from one package to another without having to swap floppy diskettes, Apple said.

Moreover, users can pass data back and forth among the various applications with the help of an electronic "mouse," which executes many of the same commands as Lisa's keyboard but reportedly does so more efficiently.

Great Lengths

Apple appears to have gone to great lengths to make its latest microcomputer system as easy to use as possible. With the company's flagship system, the Apple II, users typically need 20 to 40 hours of hands-on training before they can consider themselves technically proficient. But with Lisa, the same first-time users can learn how to run a given application in only slightly more than 20 minutes, an Apple official claimed.

Most of Lisa's purported ease-of-use features can be traced directly back to the system's software, which altogether consists of some two million lines of code that took roughly 200 man-years to write. Apple also attributes the ease-of-use capability to the mouse, which serves basically as a hand-held cursor-positioning tool and to Lisa's pictorial method of representing typical office functions.

Along the bottom of the system's display screen appears a series of drawings that resemble familiar office fixtures such as a file folder, memo pad and wastebasket. Each picture corresponds to a different office function such as retrieving the contents of existing files, creating new files, returning information to its rightful file and disposing of outdated information.

To perform a particular task, an individual uses the mouse to move the cursor to the appropriate drawing. Lisa automatically executes the task corresponding to the picture on which the cursor rests.

Built around a Motorola Corp. MC68000 microprocessor, the system comes with 1M byte of main memory and two 5¼-in. floppy disk units with a combined mass storage capacity of 1.7M bytes. Lisa also supports Digital Research, Inc.'s CP/M operating system and Microsoft, Inc.'s Xenix operating system as well as three widely used programming languages — Basic, Cobol and Pascal, a spokesman said.

Compatible With Apple-Net

In addition, the system is compatible with Apple-Net, which allows the machines to be interconnected to form local networks.

A Lisa system incorporating a 1M-byte CPU, two built-in floppy disk units, a 5M-byte hard disk unit, six integrated application programs and a display screen with keyboard retails for $9,995.

Shipments of the product begin this spring from Apple at 20525 Mariani Ave., Cupertino, Calif, 95014.

Enhanced Model Of Apple II Out

CUPERTINO, Calif. — Apple Computer, Inc. last week also announced the Apple IIE, an enhanced version of its Apple II.

The Apple IIE is intended as a replacement for the company's aging Apple II, volume shipments of which ended on Jan. 18. Billed as the first personal computer ever to incorporate very large-scale integrated circuitry, the Apple IIE requires just 31 electronic components compared with 110 for its Apple predecessor, a company official said.

In addition, the Apple IIE boasts up to 128K bytes of random-access memory (RAM) and 63 keys on its terminal keyboard, compared with 64K bytes of RAM and 52 keys for the Apple II, the official said. Both products, however, are said to run basically the same application software.

The IIE, available now, costs $1,395 from Apple, 20525 Mariani Ave., Cupertino, Calif. 95014.

IBM Prodding Users to Buy

(Continued from Page 1)

This marks the second reduction of this kind in this computer family [CW, Feb. 15]. When the 3080 series debuted in 1980, users could have 50% of their lease or rental payments count toward an eventual purchase.

Moreover, the announcement came in the wake of a number of other IBM price cuts and rental hikes for IBM's 3380 disk drives and 3880 controllers [CW, Dec. 27-Jan. 3].

The latest announcement is consistent with IBM's marketing strategy across its product board to make it more attractive for the user to buy than rent, Hart observed.

"The main motivation is to enhance the outright sale of the equipment up front as opposed to later. By dropping [the purchase percentage options] to 20%, you've really taken the incentive to lease away. This has a positive effect on swinging the rental/purchase decision toward purchase," he explained.

This strategy also serves to keep leasing companies from stepping in and taking business away from IBM in cases where lessees really do not want to buy, Hart maintained.

"Over time," he hypothesized, "you might see IBM *only* selling [as opposed to leasing]. I could see them moving in a direction where they would drop all rental and leasing options.

"Or," Hart added, "they could make the leasing prices extremely unattractive. Like with the 4320 machine: After 14 or 15 months of renting, you will exceed the [purchase] price of the machine."

Further details on the announced price changes, a spokesman said, can be obtained from IBM marketing headquarters at 4111 Northside Pkwy., Atlanta, Ga. 30327.

Promotion 'No Surprise' to Education Director

By Marguerite Zientara
CW Staff

BOSTON — What happens when a director of DP education for 800 DPers is suddenly catapulted into the role of director of corporate education for 8,000 corporate employees in 140 locations?

If the director is Roger Sullivan of Commercial Union Insurance Co. here, the move comes as no real surprise. After all, Sullivan has spent the last few years conducting an "informal marketing effort" to give upper management a general idea of how corporate hierarchies are changing and what their future educational needs might be.

"The things we have been doing in data processing — we've been dealing with ongoing education for 85% to 90% of our [DP] people — are what companies are going to face as they automate further and have a much larger proportion of professional people who are managers," Sullivan observed in a recent interview, "I see our role as managing an education process using any mix of options needed to effectively provide the education people need, after we've identified the need using a job analysis system and an individualized needs assessment system."

Sullivan believes "companies will . . . have to educate growing numbers of workers and, as they do, at all levels of the corporation, they are going to have to restructure their organization to be able to effectively manage and deliver the education needed on this scale."

Anticipated Changes

Before Sullivan assumed his new position as director of the Corporate Education Resource Center this month, he put a great deal of thought into just what those changes might be and the adjustments needed to accommodate them. In Commercial Union's case, "We have enfolded four separate corporate education departments in the various areas of the company together with a corporate education service organization we already had," he said.

In an operation that is "largely what I was doing on a smaller scale, now enlarged to a greater scale," Sullivan now works within a five-armed organization that "will allow us to implement on a corporate basis most of the methodology we had developed for data processing." Those five components are:

- A conference and education center.
- An audiovisual and instructional design unit.
- An education user liaison unit (in effect, an education marketing arm to the rest of the corporation).
- A supervisory management education unit.
- An education resource center that has five areas of responsibility: to put a job analysis and needs assessment system into effect; to recognize the option packages from the outside that might be available for the corporation and recommend their use where it would be effective; and to develop a learning package distribution center where self-learning educational materials (both technical and nontechnical) can be sent throughout the country to branch offices.

In addition, the education resource center is charged with setting up a prototype learning center in the home office — with classrooms, video center and library — to satisfy the third of the company that exists locally. Future plans call for a center in each of the company's 10 regions.

Moreover, the education resource center will do trending and forecasting of societal events that may impact the education process and "keep the corporation aware of what's coming down the pike so we can prepare for it," Sullivan said.

CW Photo by M. Zientara

Roger Sullivan

Bankers' Meet Set for Feb. 17-18

PALM SPRINGS, Calif. — Hogan Systems, Inc. is sponsoring a two-day conference focusing on competition in a deregulated environment. The conference is scheduled for Feb. 17-18 at the Rancho Las Palmas Resort here.

The conference, which is primarily for bankers, will address current issues and future trends. The format will enable senior-level executives from major financial institutions to exchange information on new banking products such as automated teller machines and banking software, according to the sponsor.

The cost of attending the conference is $495. Hogan Systems is located at Suite 400, 14951 Dallas N. Pkwy., Dallas, Texas 75240.

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Datacomm Briefs

AT&T to Add 900 Miles Of Optical Fiber by '85

BEDMINSTER, N.J. — Nine hundred more miles of high-capacity optical-fiber communications channels — able to transmit 432M bit/sec — will be put into service by late 1985, AT&T announced here last week. The specific routes will be disclosed next month.

The phone company already has 37,000 miles of optical fiber in service on more than 60 major routes. It plans next month to activate the first leg of the world's longest fiber-optic transmission cable, stretching from Mosely, Va., to Cambridge, Mass. The cable reportedly will be able to carry up to 80,000 phone calls.

The system announced last week initially will be able to carry up to 150,000 calls, but improved technology is expected to double this capacity, AT&T said.

Local Phone Company To Offer Financing

NEW HAVEN, Conn. — Southern New England Telephone Co. (Snet), which recently formed Sonecor Systems, Inc., a separate subsidiary, to market voice and data terminal equipment on a deregulated basis, announced here last week that it can also offer financing.

Snet has formed another subsidiary, Sonecor Credit Corp., in collaboration with Borg-Warner Acceptance Corp. Snet is owned 23% by AT&T. It is believed to be the first Bell operating company to begin marketing terminals through a separate subsidiary. Snet is reportedly selling equipment made by Western Electric Co., Northern Telecom, Inc., Mitel Corp. and Tie Technicon.

Rochester Phone Plans To Enter Net Business

ROCHESTER, N.Y. — Rochester Telephone Corp., an independent carrier, has announced plans to go into the network business. The company will initially offer voice, data, video and facsimile services to interstate private-line users in New York, Connecticut and New Jersey, but intends eventually to go nationwide.

Rochester Telephone expects its 6-GHz to 11-GHz microwave-based network to begin operation late this year.

Concurrent with the announcement of the new network, Rochester Telephone said it has requested authorization from the Federal Communications Commission to operate digital termination systems in Buffalo, Syracuse, Rochester and Albany, N.Y., in addition to Stamford, Conn., and Honolulu. The first five cities are among the seven that will be interconnected initially by the new microwave network (the other two are New York and Newark, N.J.).

Sponsors of Immigration Bill Considering Its Reintroduction

WASHINGTON, D.C. — The sponsors of controversial immigration reform legislation that would require a national worker identification system are now considering whether to reintroduce the bill, which failed to get final approval before Congress adjourned late last month.

The Immigration Reform and Control Act, a sweeping rewrite of the nation's immigration laws, easily passed the Senate last year before becoming bogged down in the House amid disagreements about its illegal alien amnesty provisions and its provision to penalize employers for hiring illegal aliens.

As part of the employer sanction plan, the legislation would direct the administration to develop a counterfeit-proof system to identify persons eligible to hold jobs in the U.S. Opponents of the system within Congress and the administration argue that it would cost billions of dollars and constitute a de facto automated national identification system subject to "totalitarian" governmental abuse [CW, Aug. 30, Oct. 18].

The considerable controversy surrounding the legislation could not be resolved during the final weeks of the last Congress. The bill's supporters should reach a decision on whether to reintroduce the bill within the next few weeks, according to Capitol Hill sources.

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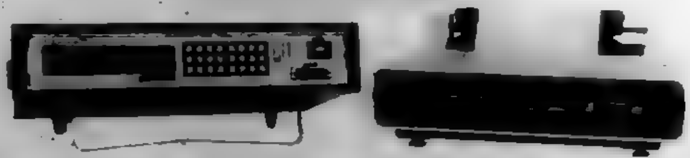

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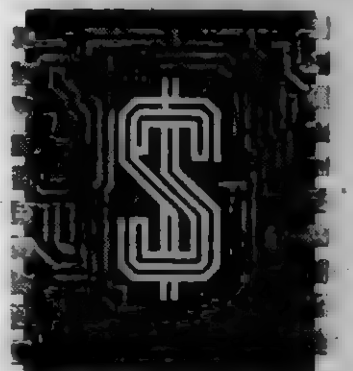

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$4,000 Executive Workstation

First Beta Test User Lauds Kontact for 'Smarts'

By Bruce Hoard
CW Staff

KANATA, Ont. — The first beta test user of Mitel Corp.'s $4,000 Kontact executive workstation said it has more "smarts" than the Northern Telecom, Inc. Displayphone and is more "truly" an executive workstation than the more expensive Xerox Corp. 8010 Star.

Kontact, the first member of Mitel's Executive Work System, will be available in the U.S. this spring. It combines electronic mail, time management, financial planning, data communications and word processing with voice telephony and works on analog telephone systems.

Its basic hardware features include a multiline telephone, dynamic keyboard, 12-in. display, 8-bit Motorola, Inc. 6809 microprocessor, 128K bytes of random-access memory, 5¼-in. 320K-byte diskette drive and built-in modem.

Kontact's first user is Statistics Canada, a federal agency. Statistics Canada is pleased with the terminal because it has done what it was expected to do, according to Dennis Harrington, technical analyst for the company's Production and Services Division.

Asked to compare Kontact with the $10,000 to $15,000 Xerox Corp. Star workstation, of which his division has three, Harrington replied, "It's a different thing altogether. The Kontact is more of a truly executive workstation, more so than the Star."

Although Statistics Canada did not test Northern Telecom's Displayphone, Harrington said he had looked at the device, but dismissed it. "It wasn't software driven and it didn't have the smarts Kontact does," he explained. "Kontact is really a micro, so it does have a lot more smarts to it."

Packages Arriving

Much more will be known about Kontact after three crucial applications software packages that Mitel is developing arrive and are tested, Harrington said. The three packages are Execucalc, an electronic spreadsheet package; Execuwrite, a word processing package; and Execubasic, a Basic language programming package.

If the three software packages are satisfactory, Kontact will be usable by executives, secretaries and programmers. Statistics Canada was told when it starting testing Kontact on Nov. 20 that the three would be available by April or May.

Harrington has spent considerable time working with the two Kontact terminals being tested, and he likes them.

"Everything that we got it for and the standard software that we got with it is doing the job up to this point," he said in a recent interview. "We would really like to get our hands on the Execubasic and the Execucalc."

However, Harrington is not totally pleased with the terminal. "The only weakness I see is I'd like to be able to download files," he said. "I want to be able to get into the system, download a table, store it on a disk and then transfer it to another Kontact."

Kontact Executive Workstation

The two terminals are being used by the division director and his secretary, both of whom are happy with their experiences. They are primarily using the electronic mail and time management (agenda) software.

"We didn't look at it [Kontact] as a microcomputer because we didn't have the software," Harrington stated.

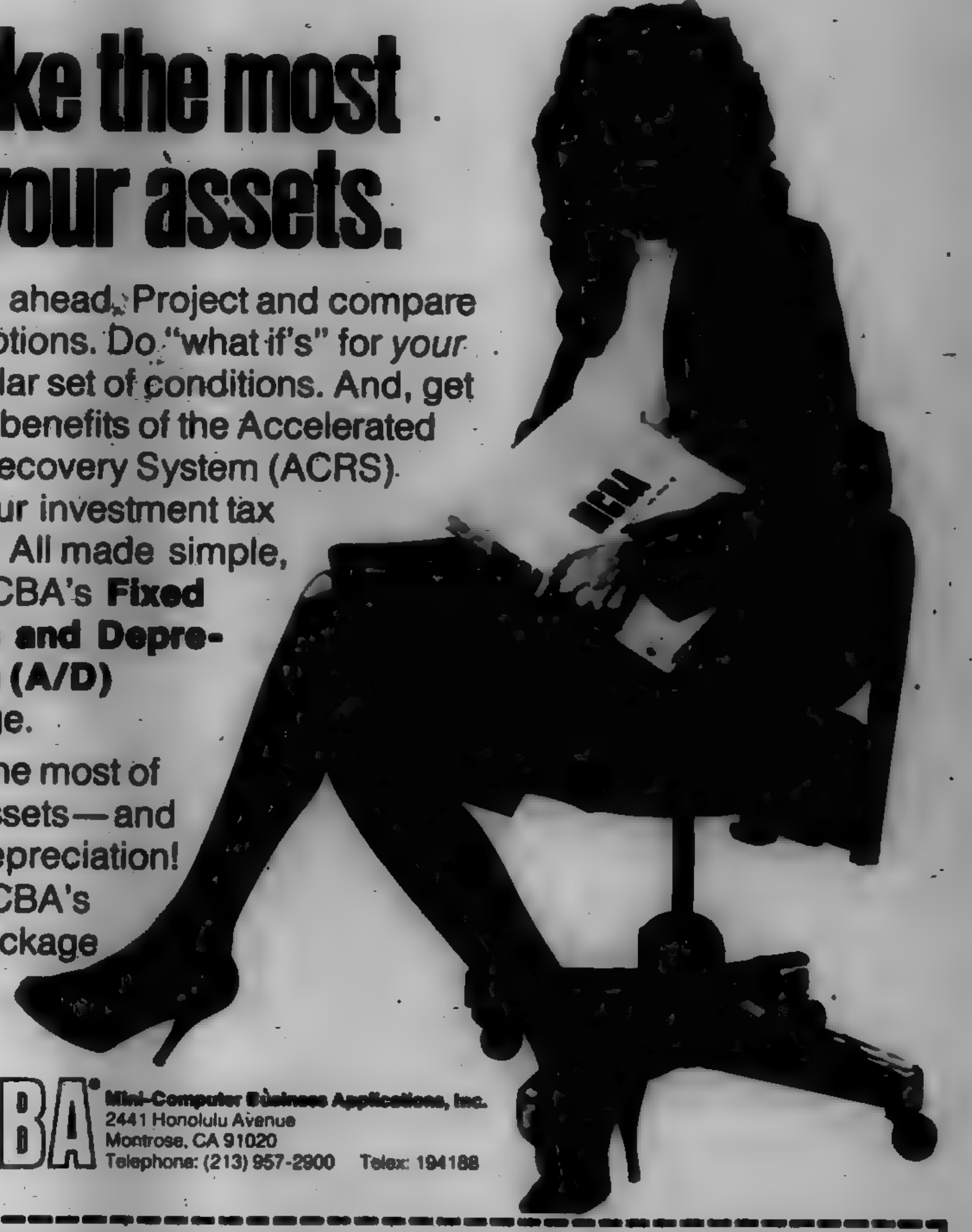
"We looked at it as a local-area office mailing network type of application mainly on the communications and agenda side. That is what we brought it in under," Harrington said.

Kontact's standard telephone features include autodial, display-based dialing, redialing, conference calling and speakerphone, which Harrington referred to as "quite handy."

In their Statistics Canada configuration, the Kontacts are linked to each other and the Datapac trans-Canada time-sharing network as dumb terminals.

Harrington said he envisions a future cluster of 25 intelligent Kontacts linked through a private branch exchange communicating among themselves and the outside world at 300 bit/sec via the telephone system.

Harrington disagreed with Mitel's assertion that Kontact is appropriate for use in the home. Using a Kontact at home, he declared, would be comparable to buying a microcomputer to balance a checkbook.



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Multiple Personalities 'Mapped' by Computer

By Marguerite Zientara
CW Staff

WASHINGTON, D.C. — Natasha is one woman with 127 different personalities or personality fragments. One day recently, as she sat quietly in a scientific laboratory here with electrodes wired to the top and back of her head, four of those personalities stared, one by one, at a strobe light that set off electrical signals in her brain. An electroencephalograph (EEG) recorded the signals transmitted by the electrodes and fed them to a computer for translation.

Out of the computer came different "maps" of each of Natasha's personalities — maps of brain wave patterns in different states of awareness, passive or during various cognitive processes.

Often sensationalized by the popular press, the disorder of "multiple personalities" has been decried by some mental health professionals as "faked" and "overdiagnosed." In the last few years, computers have helped prove its existence and are now helping researchers better understand and treat the phenomenon.

A leading researcher on "multiples" is Dr. Frank Putnam, staff psychiatrist for the Adult Psychiatry Branch of the National Institute of Mental Health (NIMH), who is treating Natasha. Putnam is "mapping" the brains of as many multiples as possible with the Digital Equipment Corp. PDP-11-based Richard Coppola Brain Electrical Activity Mapping (RCbeam) system, named after its creator (see story below). The RCbeam system calls for flashing a strobe light in the eyes of a multiple and measuring the resulting electrical signals in the brain.

"The multiples I use in my research are aware they are multiples and can switch personalities on command," Putnam noted. "Very frequently there are personalities who aren't aware of the existence of others within them."

Alternate personalities exhibit physiological differences said to be so profound that the syndrome cannot possibly be faked. Besides the brain waves, heart rate and blood pressure change with the personality, explained Putnam, who has compiled what is considered the most complete collection of statistics on multiples to date. He has found that:

- The brain waves of some alternate personalities of the same multiple vary as much as the brain waves from one normal person to another.
- Multiples can radically alter their voice patterns, accents and speech in ways experts consider unusual and once thought impossible.
- Alternates may have their own independent consciousnesses, intellects and memories.

Multiples — 90% of whom are women — have histories of "many years of being badly abused as children," Putnam explained. The abuse can be sexual or physical. Concentration camp victims have also been known to establish multiple personalities as a survival mechanism, Putnam noted, adding that most multiples are "very bright."

However, many victims of the disorder "have become reasonably successful while still multiples" and "at least half of all multiples who receive therapy can be cured within three to five years," Putnam noted.

How the Brain-Mapping System Works

WASHINGTON, D.C. — How does Dr. Frank Putnam of the National Institute of Mental Health (NIMH) "map" the brains of people with multiple personalities?

He uses a system designed in 1979 by Dr. Monte Buchsbaum, a neuroscientist formerly with NIMH, and Dr. Richard Coppola, a neuroscientist currently at NIMH.

The Richard Coppola Brain Electrical Activity Mapping (RCbeam) system is based on a Digital Equipment Corp. PDP-11 computer with a Matrox, Inc. black-and-white graphics display, Hewlett-Packard Co. 9876A printer/plotter and an electroencephalograph (EEG). Coppola wrote the software for the system in assembler, Fortran and Pascal.

For each personality of a "multiple," Putnam relies on a strobe light to stimulate the brain and set off a minute electrical signal capable of being measured by EEG electrodes. The electrodes are placed in various arrays — called "montages" — on a patient's vertex (top of the head) and occiput (back of the head). "Each electrode can give you the voltage directly underneath it," Putnam explained.

Putnam then puts the voltages indicated by the EEG into a matrix and calculates, through a "least squares" data-fitting method, what the voltages are over the rest of the subject's head.

His data is fed into the PDP-11 and what comes out are "the event-related potentials that are recorded off the scalp in response to visual stimulation," Coppola explained.

"That data is then massaged into a view of the brain" — a map — "either by coding it into a black-and-white gray scale or into a color display," Coppola continued. The map is an outline of the brain on a computer display "wherein each pixel is then gray-scale encoded to represent a particular amplitude of the response at [each] point on the surface of the brain."

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'How Can We Help You?' Senate Panel Asks Vendor

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Belying the electronics industry's impression that Capitol Hill policymakers undervalue its importance, Control Data Corp. President Robert M. Price was welcomed to a Senate finance subcommittee hearing last week with an earnest "tell us how we can help you."

Adding a strong note of urgency to the subcommittee's deliberations, the hearings began last Wednesday morning just as President Reagan was winding up meetings with Japan's newly elected prime minister, Yasuhiro Nakasone.

Appearing to discuss government policies to promote high-growth high technology industries, Price was repeatedly pressed by subcommittee chairman John H. Chafee (R-R.I.) for specific proposals to encourage high tech development. Price's major recommendation to the subcommittee could be summed up as "don't tie our hands."

Ambiguous Laws

In particular, Price called for legislation to remove the ambiguity of antitrust laws as they apply to cooperative research and development ventures by American firms. He pointed to the successful Magnetic Peripherals, Inc. joint venture and Microelectronics and Computer Technology Corp. (MCC), currently under development. MCC, comprised of 15 leading industry companies, got a qualified clean bill of health from the Justice Department's Antitrust Division just this month [CW, Jan. 17].

Despite the obvious need for R&D cooperation in the fast-paced computer and semiconductor fields, which face concerted, coordinated Japanese competition, Price remarked that "very little official guidance exists as to either what constitutes a lawfully structured joint R&D venture or what conduct will ultimately be considered lawful by the courts if challenged. Thus," he said, "participants in cooperative R&D ventures must proceed at their peril."

Price acknowledged that the prevailing attitude within the Justice Department and the Reagan administration as a whole is to promote such cooperation. But, he said, "a company interested in cooperation is deterred by ambiguity, uncertainty and great risk — all arising out of antitrust laws enacted in the economic context of the 19th century."

Support Legislation

The CDC president urged Chafee's Savings, Pensions and Investment Policy Subcommittee to support legislation introduced, in Price's words, to "clarify, not change, U.S. antitrust laws." The bills would do so by establishing criteria for organizing and conducting joint R&D ventures without fear of antitrust attack.

Price was asked by Chafee if there is anything else on the industry's "wish list," to which Price responded that CDC is concentrating on what it can do for itself and is not counting on "favors" from Washington. He did, however, comment that recent tax law changes increasing R&D tax credits have been "particularly helpful in a down economy" and urged Congress to do all it can to ensure free international trade and equal access to overseas markets without resorting to protectionism.

Similarly, newly elected Rep. Ed Zschau, a Republican representative of Silicon Valley and former chairman of System Industries, Inc., a disk and tape storage systems maker, suggested the role of the federal goverment should be to develop "an entrepreneurial industrial strategy" that fosters innovative new firms.

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NSF Calls for National Supercomputer Effort

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — A National Science Foundation (NSF) panel has called for a federally coordinated national program to stimulate U.S. development and use of supercomputers.

Stating that "U.S. leadership in supercomputing is crucial for the advancement of science and technology and therefore for economic and national security," the 15-member panel of scientists and engineers warned that large-scale computing in the U.S. may be eclipsed by Japanese research and development efforts by the end of the decade.

The NSF report, issued last week, stems from a workshop on supercomputing held last spring under the auspices of the foundation and the Defense Department. The panel, formed as a result of the workshop, said large-scale computing is "a vital component of science, engineering and modern technology, especially those branches related to defense, energy and aerospace."

Nonetheless, the report noted the slackening of U.S. government support of supercomputer R&D during the 1970s and concluded that "there is a distinct danger that the U.S. will fail to take full advantage of [its historical] leadership position and make the needed investments to secure it for the future."

The panel cited two major problems: access to supercomputers, which the report called "inadequate in all disciplines," and the uncertain outlook for U.S. development of the next generation of supercomputers.

"The capacity of today's supercomputers is several orders of magnitude too small for problems of current urgency in science, engineering and technology," the report said. "Nevertheless, the development of supercomputers, as now planned in the U.S., will yield only a small fraction of the capability and capacity thought to be technically achievable in this decade."

The NSF panel said the American computer industry's supercomputer R&D effort "reflects competitive commercial conditions" and not "the entire national scientific and security interest." Therefore, "it is not reasonable to rely solely on industry's own initiatives and resources in this area."

The panel noted the supercomputer development programs of France, West Germany, the UK and especially Japan, whose government-sponsored supercomputer project seeks to develop by 1989 a machine 1,000 times faster than current supercomputers. One fear is that if the next generations of supercomputers come not from American firms but from foreign organizations, next-generation U.S. scientific and military computing needs may go unmet.

Therefore, the NSF group recommended a four-element national program, supported by a system of computer networks linking government, industrial and university scientists and engineers, to foster R&D and expanded use of advanced computer technology. The four components of the proposed program are:

- "Increased access for the scientific and engineering research community through high bandwidth networks to adequate and regularly updated supercomputing facilities and experimental computers."
- "Increased research in computational mathematics, software and algorithms necessary to the effective and efficient use of supercomputer systems."
- "Training of personnel in scientific and engineering computing."
- "Research and development basic to the design and implementation of new supercomputer systems of substantially increased capability and capacity, beyond that likely to arise from commercial requirements alone."

The NSF report said the program should be coordinated within the federal government by an interagency policy committee assisted by an interdisciplinary advisory panel. The program will not be successful without funding exceeding the current U.S. level of supercomputer R&D expenditures, the NSF panel added.

CSC Loses Appeal In Supreme Court

WASHINGTON, D.C. — The U.S. Supreme Court has refused to overturn indictments against Computer Sciences Corp. (CSC) and several present and former CSC employees charged with defrauding the federal government in connection with a large 1972 DP services contract.

The indictments, handed down in 1980, charged among other things that the huge Infonet contract had been won by bribing a federal procurement officer. In 1981, the charges were thrown out by a federal court in Virginia, but most were then reinstated by an appeals court last summer [CW, June 28].

Because the defendants were unsuccessful in seeking a Supreme Court review of the reinstatement of those indictments, the case will go back to trial in the federal court in Alexandria, Va., probably within the next few months, according to the Justice Department.

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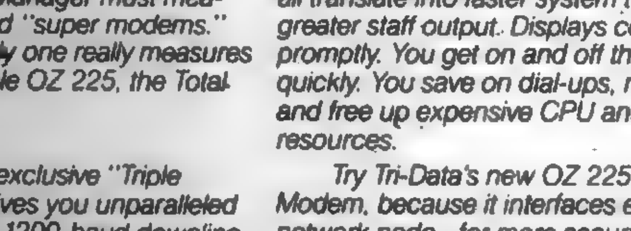

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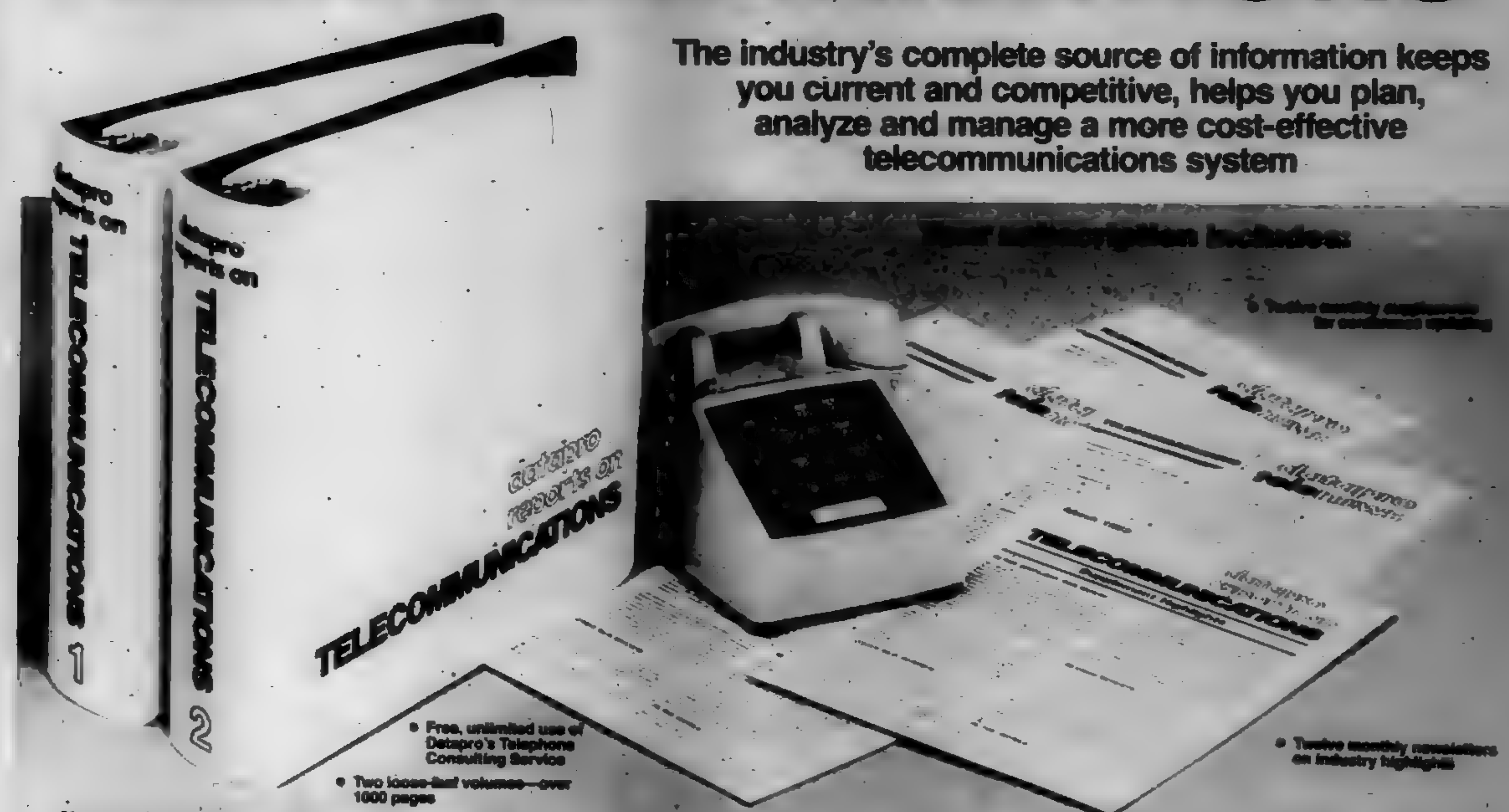
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Communications Chiefs Seen Under the Gun

By Bob Johnson
CW New York Bureau

NEW YORK — AT&T's divestiture of the Bell operating companies will initially cause a degradation of data communications service, pushing DPers to "jump down the throats of telecommunications managers."

That prediction came from Michael Kanthal, New York chapter chairman of the Association of Data Communications Users (Adcu), who spoke at a recent meeting addressing what the AT&T breakup will mean to data communications professionals.

Because telecommunications managers now deal with a number of different companies in the event of a communications problem, Kanthal said, data transmission will suffer because of lost time and added confusion when the Bell divestiture becomes effective. "Not only will data communications professionals have to figure out which company to go to concerning communications issues, but AT&T and the Bell companies themselves are going to have to sort out which company has responsibility for what," he pointed out.

Kanthal said he personally spoke to AT&T and New York Bell representatives prior to Jan. 1, and neither one knew what their specific responsibilities would include.

The speaker offered a typical data communications scenario as an example of what telecommunications managers can expect: "Say, for instance, that your company needs to transmit data from New York to Boston. You're not going to have your local area loop [lines, which connect AT&T Long Lines to the user site], the AT&T circuit or the New England area loop taken care of by one company anymore. Each will be separate, and you'll have to deal with each individually.

"Additionally," Kanthal observed, "if your hardware is from a different vendor, another company has to be called in. The creation of American Bell further confuses hardware matters."

Moreover, the engineering coordination involved in such a task will create additional work for telecommunications professionals if they do not want AT&T service at an additional charge. "Simply stated, you are going to need more bodies to get the same job done."

In addition to these problems, Kanthal noted that the divestiture will have a "trickle down" financial impact on companies. "As a manager at Nabisco said, 'If the price of my phones go up, I raise the price of my cookies.' "

Degradation of Service

All of these factors will take their toll on the DP manager as well as the communications manager, according to Kanthal, who noted that a degradation of communications service is sure to hit DP shops with a noticeable lack of efficient "uptime." It will directly affect on-line systems.

"DP managers will have to sit down with data communications managers and spend time learning what impact this breakup is going to have on communications lines and data transmission, so major interruptions can be avoided. A joint plan to reduce the negative impact from both the computer operations and network areas should be mapped out," Kanthal advised.

Part of this planning will mean that DP managers will be requesting more money for their budgets so they can hire the needed additional people. Kanthal called this another annoyance created by the new communications arena.

Although Kanthal painted a disturbing picture of the future of data communications, he did note that it has a bright side: "The divestiture has forced data communications and the telecommunications manager to become more visible within companies. And because there is more work to be done, more jobs will be available."

Author to Speak At ICCCM Meet

NEW ORLEANS — Prof. Ben Schneiderman of the University of Maryland will keynote the Fifth Annual International Conference on Computer Capacity Management (ICCCM), which will be held here April 18-21. Author of the recently published *Software Psychology: Human Factors in Computer and Information Systems*, Schneiderman will address "The Psychology of Serving the User Community."

Schneiderman will examine the concept of human performance in using computer and information systems. He reportedly will describe techniques to enable data center managers and management information systems directors to improve the human aspects of computer systems, so as to produce greater user productivity and satisfaction.

The conference is sponsored by the Institute for Software Engineering, the data processing education, publishing and research organization. The general registration fee is $445. The fee for members is $345, for speakers, $245, and for university faculty members, $150. Further details are available from Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

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N.Y. Bank Trying New Ways to Fire Up DPers

By Bob Johnson
CW New York Bureau

NEW YORK — Just as American corporations are turning to their management information systems (MIS) divisions to help cope with economic dilemmas, the MIS divisions are turning to their staffs for better productivity.

But DP productivity is for the most part intangible, making it difficult to measure a worker's output, observed Bruce Schultz, assistant manager for human resources in the Operations Division of Manufacturers Hanover Trust Co. here. "It's not like you're doing time studies on an assembly line. It's hard to tell if the DPer is using all of the resources available to him or if he is truly happy the way things are being done in his area."

Complicating that problem, Schultz pointed out in a recent interview, is the traditional perception of DPers as mavericks within the corporate structure who are generally left alone to do their "mysterious" jobs.

For those reasons, Manufacturers is implementing measures to make its DPers more aware of the job improvement opportunities within the company and help them feel that they are contributing to the overall good of the company. "We have a Special Systems and Programs Subcommittee of the company's overall Human Resources Productivity Committee, which specializes in the needs and problems of the DPer," Schultz said. "This group looks at the computer side of our Operations Division to see just what can be done to make people more efficient and satisfied in their jobs."

The subcommittee is also studying alternate types of work situations. A work-at-home pilot project that is being planned would allow both full-time and part-time DPers to work on projects at remote sites. "In situations where, say, 12 extra people are needed for a special job, a project like this can help us determine if work-at-home is feasible," Schultz maintained.

Another project undertaken by the subcommittee is a business systems strategy plan. Schultz said that this project addresses the allocation of the system and program group resources, attempting to link them with the business strategies of the company's user groups.

The outcome of such a project gives both sides a common goal, preventing people who aspire to the same thing from going off in different directions. "The DPer sees his work being applied to a project with a set goal. It's not just an anonymous program being installed as part of a greater system anymore. This enhances his professional identity," Schultz said.

"DPers are a bit more complex than the average employee, but they are still people," he added. "Productivity awareness pulls DPers back into the group. It shows them the things they can accomplish. And DP management once again recognizes that their employees basically want what all employees want — satisfaction and management recognition."

What Boosts Worker Morale?

NEW YORK — Just what are DP managers doing to boost the morale and productivity of their employees?

United States Trust Co. of New York encourages camaraderie among its workers. Vincent Stendardo, operations manager for the company, has seen many different changes in technology and personnel during his 15 years at U.S. Trust. The one theme that runs throughout all successful operations, he said, is workers working together to achieve a goal.

"If there isn't a pleasant working atmosphere where people get along and assist each other, things will not be accomplished smoothly," Stendardo said. "Basically, it's just human nature. People are more productive when they are happy."

U.S. Trust has some physical plans to try to boost productivity. It expects to install an automated job scheduling system and an automated tape management system to assist operators.

The most effective motivator, according to another New York DP executive, is competitive salaries. But, according to Ed Kahn, director of DP for New York's Mount Sinai Medical Center, "the key to productivity anywhere is good communication. You can't have people worrying about nonissues; they have to have their minds clear to get the job done.

"Good management-employee communication gives people the feeling that they are part of departmental goals and objectives. In this way, they have a chance to air gripes, identify problems and endorse what they feel is important so things don't come as a surprise later on."

A DP manager for a large New York-area manufacturing company who asked to remain anonymous said that a productivity issue of paramount importance is the competency of workers. More time and money is wasted on people who really do not know how to do their jobs the way they should be done, he said. He attributed that to either poor hiring practices or faulty management.

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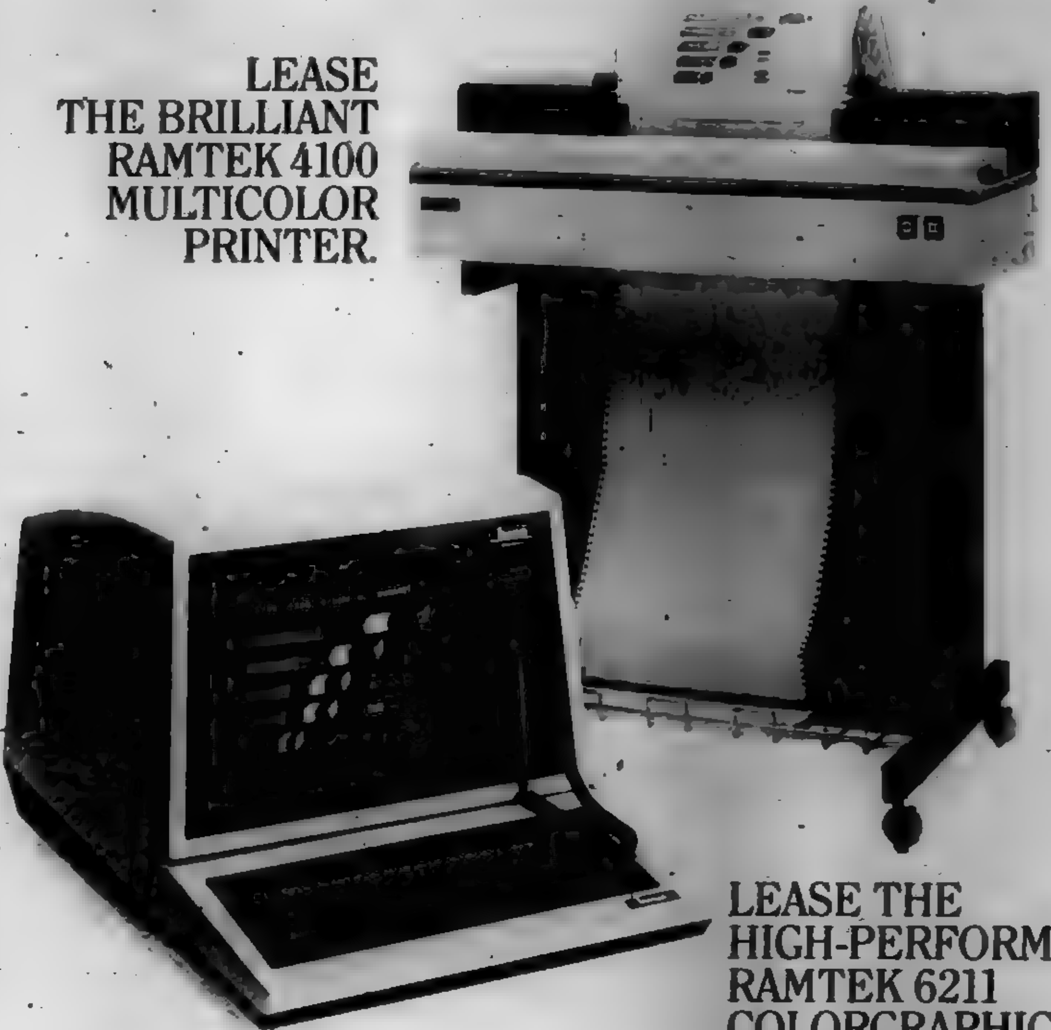

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IC4GL Conference Set for April 21

ANN ARBOR, Mich. — Database Design, Inc. will hold a conference here on "Information Centers and Fourth Generation Languages" (IC4GL) April 21-22 in association with the University of Michigan Graduate School of Business Administration.

IC4GL is geared toward helping senior managers make strategic decisions about the use of information centers and fourth generation languages within their environments. The conference will focus on user experiences to provide senior DP and general managers with an understanding of benefits, potential pitfalls and key success factors in the acquisition and use of these technologies.

Guest speakers will include author James Martin, head of Database Design; Dr. Dixon Doll of the DMW Group; Rick Crandall of Comshare, Inc.; and Ed White of IBM.

The registration fee for the conference is $1,000. More information is available from Database Design at 2020 Hogback Road, Ann Arbor, Mich. 48104.

Feb. 24 Meet to Address Performance Management

SCOTTSDALE, Ariz. — The Fourth Annual Conference on Electronic Data Processing Performance Management, sponsored by Applied Computer Research, Inc. (ACR), is slated to take place here Feb. 28-March 4.

This conference will focus on the productivity of human and machine resources in serving user needs, with primary attention on managerial aspects. Topics to be covered include DP/user relationships, communicating with management on performance issues, long-range and capacity planning, problem/change management and interpersonal communications.

Registration for ACR clients is $525 and $600 for nonclients. More information can be obtained from ACR through P.O. Box 9280, Phoenix, Ariz. 85068.

Nucon Meet Set for April

KANSAS CITY, Mo. — The 1983 NCR Corp. User Conference (Nucon '83) will be held here April 24-27. This year's theme is "Information Management: The Bottom Line."

Six concurrent tracks will provide 66 sessions at the conference. Major speakers will include William Anderson, chairman and chief executive officer of NCR, and Dr. Gerald Bell, professor of organizational behavior at the University of North Carolina's School of Business.

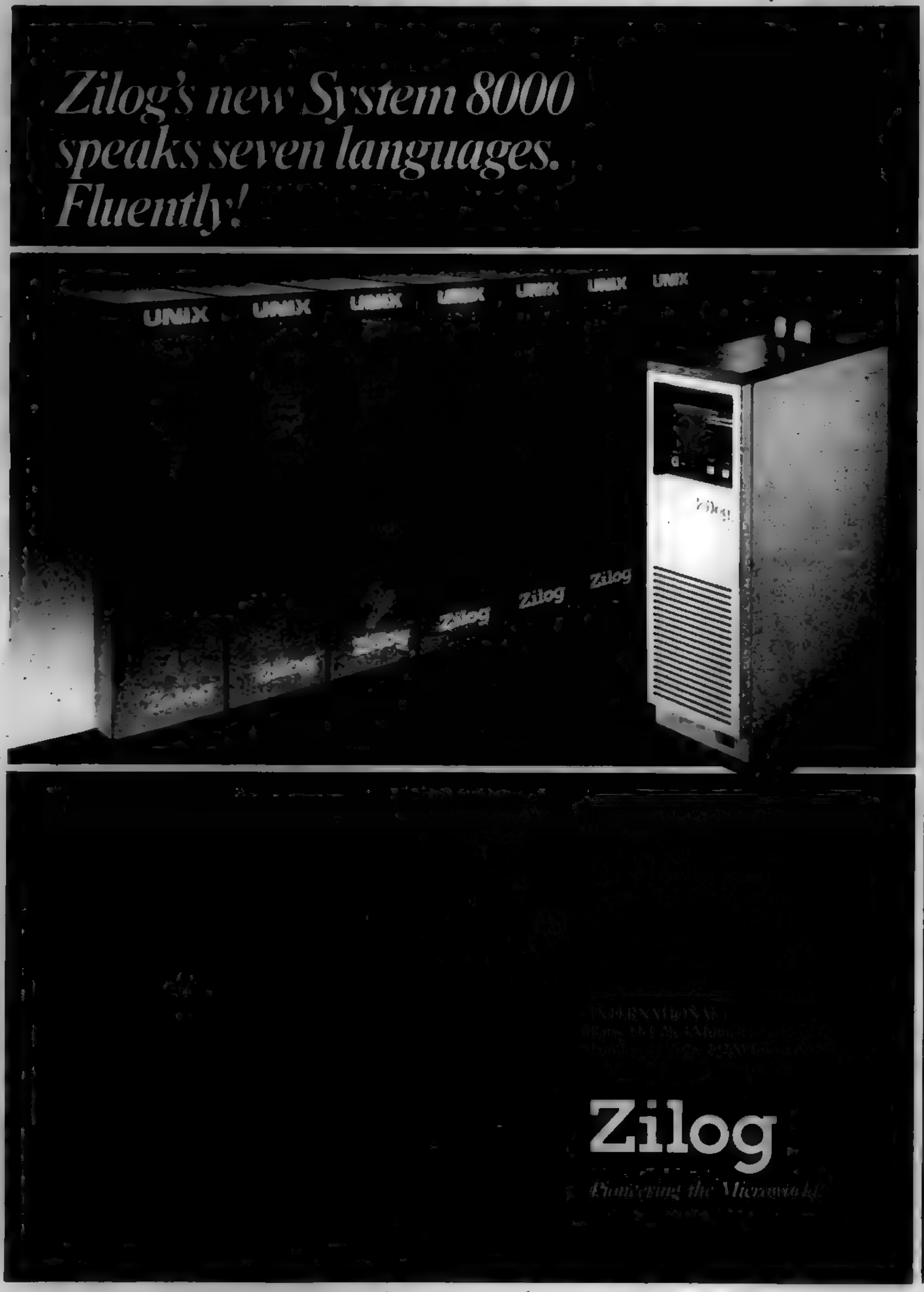
Registration for Nucon '83 is $290 before March 15. Further details are available from the Federation of NCR User Groups, Mail Station SDC-2, Dayton, Ohio 45479.

Houston ICCA To Hold Seminar

HOUSTON — The Houston Chapter of the Independent Computer Consultants Association (ICCA) will cosponsor a seminar titled "How to be a Successful Computer Consultant," here Feb. 12.

Led by Walter E. Ulrich of Walter E. Ulrich Consulting, the seminar will discuss the development and management of a computer consulting practice.

Registration for this event is $95. Further details can be obtained from Steve Glagow at Walter E. Ulrich Consulting, Suite 450, 2626 South Loop W., Houston, Texas 77054.



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No Recession for This DPer As Hughes Plays Catch Up

By Robert Batt

CW West Coast Bureau

LOS ANGELES — For Chuck Bates, manager of systems and operations at Hughes Helicopters, Inc., the past 12 months have held no evidence of recession. Instead they have been the most frenetic period of change and expansion in his varied 16 year career as a DP professional.

"In the last year we have trebled our CPU capacity, increased our disk storage by about 60%, doubled our printing capability and added 120 CRTs," said Bates, adding, "We have been overwhelmed by what is going on. All you can do is keep people reassured that we have an overall plan and we know where we are going."

Bates joined Hughes Helicopters after working for 11 years at Dart Industries, where he held the position of systems programming manager at the time of his departure. He spent the four years before that working as a systems programmer at IBM.

Playing Catch Up

"Hughes Helicopters is a company that is trying to play catch up," Bates said in a recent interview. "For a long time it was seen by some people simply as a hobbyhorse for the Howard Hughes empire. Now we are trying to develop into a fully mature company, which means providing a tremendous amount of user-friendly DP tools for senior management."

Hughes has benefited from the Reagan administration's push to increase the nation's defense capabilities, which has ushered in a period of tremendous growth for the company. For example, Bates was one of several new managers when he joined the company just over a year ago. "No one was in their present management job 18 months ago. Approximately 60% of the managers are new to the company and the rest switched to new job classifications," he noted.

Those wholesale changes in management came with problems. "We were faced with a need to get a team effort going and to integrate our different management approaches, so there were a lot of human engineering problems to confront," Bates recalled. But, "at the same time, the mass of new faces allowed for some fresh thinking to be injected into the company."

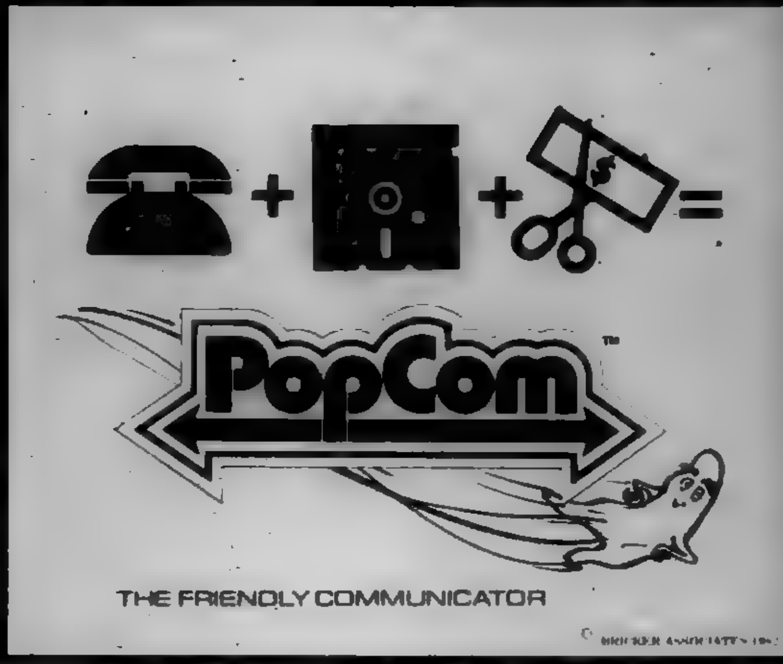
Bates decided the best approach would be to "jump in with both feet and pray I was right." Bates, who had managed five systems programmers in his last job, had to learn how to manage 55 people of diverse backgrounds in areas such as computer operations and telecommunications, where he had little hands-on experience.

Moreover, "I was immediately confronted with a shortage of personnel in computer operations. Capacity planning and performance analysis functions were not in place. My job was to bring these things together and make them operational."

Among the changes Hughes has overseen in the past year are:

- A major software environment change to an IBM telecommunications package, the Multiple System-Network Facility.
- The implementation of new modeling, graphics and reporting packages.
- A switch in printing systems from a Honeywell, Inc. Page Printing System to two Xerox Corp. 9700 machines.
- The addition of a new scanner and storage lines to the company's IBM 3705 telecommunications controller.

In addition, Bates is planning to replace his Amdahl Corp. 470V/8 and IBM 3031 mainframes with faster processors from the same two companies.



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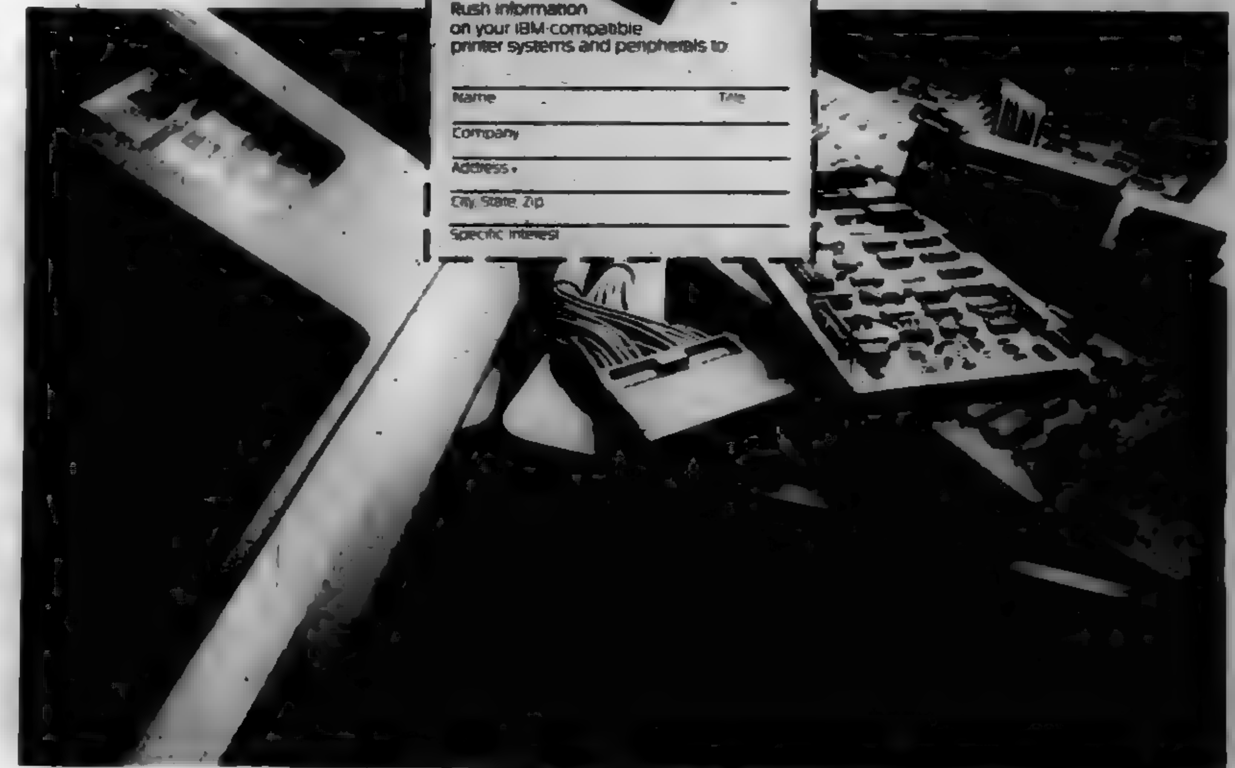

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Specific Interest

Stanford Gets Top Grade in Grad School Poll

WASHINGTON, D.C. — Stanford University, MIT, the University of Illinois and the University of California at Berkeley have the best reputations of all graduate educational institutions in the field of computer science, according to a recently released survey.

The survey, "An Assessment of Research-Doctorate Programs in the United States," ranks the top 10 graduate institutions in 32 academic fields in terms of reputation and faculty publications. The reputation ratings were drawn from surveys of 5,000 faculty members at 228 colleges and universities. The publications category rates the colleges according to the number of articles published by members of the department.

The top 10 institutions in the field of computer science in both categories are:

- ***Reputation:***

1. Stanford University.
2. MIT.
3. Carnegie-Mellon University.
4. University of California at Berkeley.
5. University of California at Los Angeles.
6. University of Illinois.
7. University of Washington.
8. University of Southern California.
9. University of Texas.
10. University of Wisconsin.

- ***Publication:***

1. University of Illinois.
2. University of California at Berkeley.
3. MIT.
4. Stanford University.
5. University of California at Los Angeles.
6. University of Southern California.
7. Ohio State University.
8. University of Maryland.
9. University of Minnesota.
10. University of Wisconsin.

Officials stressed that the study rates the programs on the basis of their success at turning out scholars. It does not attempt to rate their value to private industry.

The survey was sponsored by the Conference Board of Associated Research Councils, a coalition of the American Council of Learned Societies, the American Council on Education, the National Research Council and the Social Science Research Council. It follows up on similar studies published by the American Council on Education in 1968 and 1970. This was the first time the computer science field was included.

Fose '83 Slated For March 14

WASHINGTON, D.C. — Based on the theme "Office Systems Integration: Myth or Reality?", the Federal Office Systems Expo (Fose) '83 is slated to take place here March 14-17.

The conference will host 61 sessions, including one by industry guru James Martin. The concurrent exposition will showcase product offerings from some 150 vendors.

Early registration for the full conference costs $225, and one-day-only registration is available. Further details can be obtained from Fose '83 sponsors at National Trade Productions, Inc., Suite 206, 9418 Annapolis Road, Lanham, Md. 20706.

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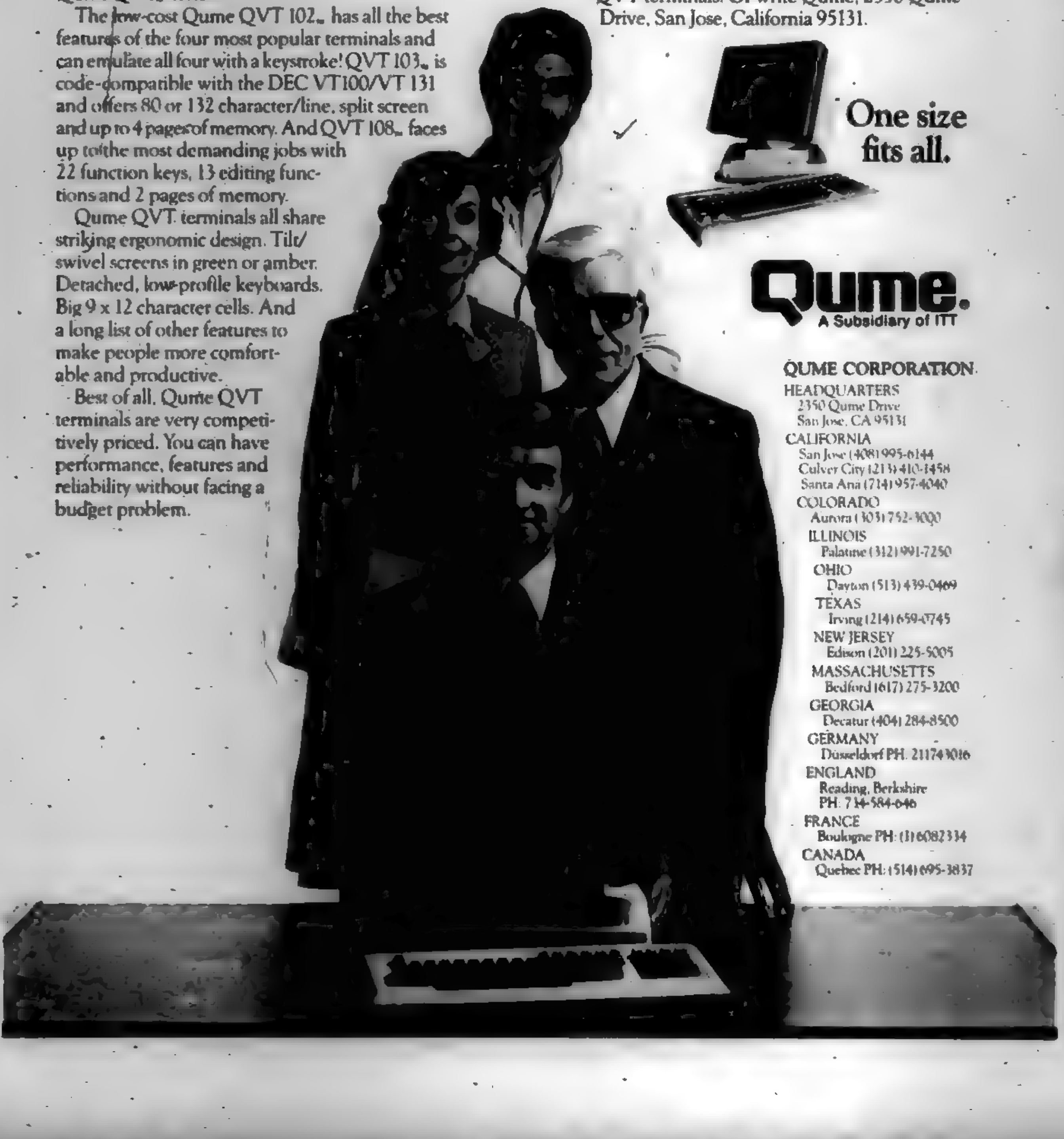
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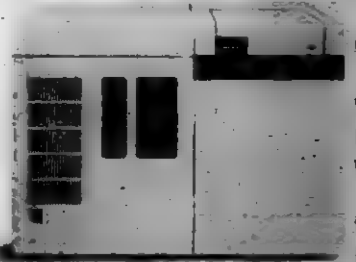
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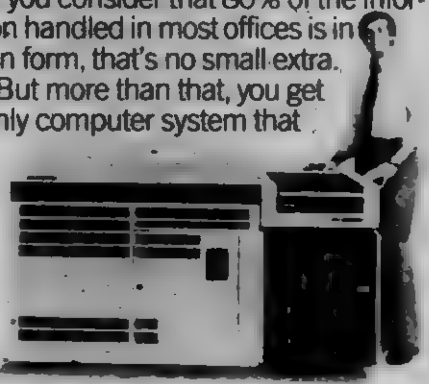
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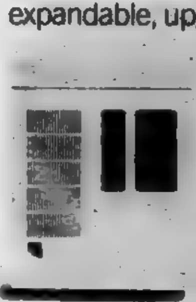
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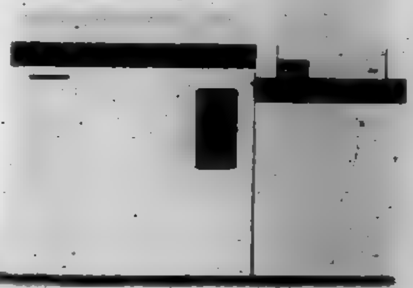
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Trace Package Helping to Teach Assembly

BOISE, Idaho — It is more difficult to teach assembly language programming than any other language, basically because it requires handling a lot of details. These details can overpower a novice programmer.

However, once a person is experienced at programming, use of assembly language provides greater flexibility. With this rationale in mind, the Idaho Transportation Department here set out to find and train new assembly language programmers. A training class was set up and 16 state employees were selected to attend.

Joel Gyllenskog, a general partner with Packaged Software of Idaho here and a former university professor, was chosen to teach the course. He decided to enlist the help of a computer and selected Psitrace, a software package from his firm, to monitor the execution of the students' programs.

The trace program shows each assembly language instruction as it is executed. The trace includes the hexadecimal code, the disassembled instruction (including mneumonic and decimal equivalents of the fields), the condition codes and the registers, which are modified by the execution of the instruction. For instructions that access the computer's memory, the contents of the affected cells are also printed.

One training technique Gyllenskog used successfully was to provide sample programs to the students for modification or enhancement. By seeing how the original instructions worked together, the students were able to see where the changes needed to be made. He explained that by tracing their modified programs, students could quickly see if the changes they had made affected the desired results.

"Very often it was back to the drawing board," he noted, adding, that the rapid feedback allowed successful results sooner, so that more material could be covered and understood.

"Traces, such as the one used in this class, are helpful since they show details which may otherwise be overlooked," Gyllenskog said.

Although the class is over, the trace is still used. Both the trainees and the veterans use it: "Illusive bugs in assembly code, Cobol, Fortran and even third-party software packages are tracked down," he noted. "Once the problems are isolated, the solution usually follows easily."

Unit Set Up to Aid Disabled In Selection of Computers

NORTHVILLE, Mich. — With the widespread use of computers as aids to the handicapped comes the problem of choosing the computer that is right for a particular individual.

The Handicapped's Source, a division of Intelligent Consumer Electronics (ICE) here, has been established to help solve that problem. The Handicapped's Source provides sales and distribution for computer products and services for the handicapped.

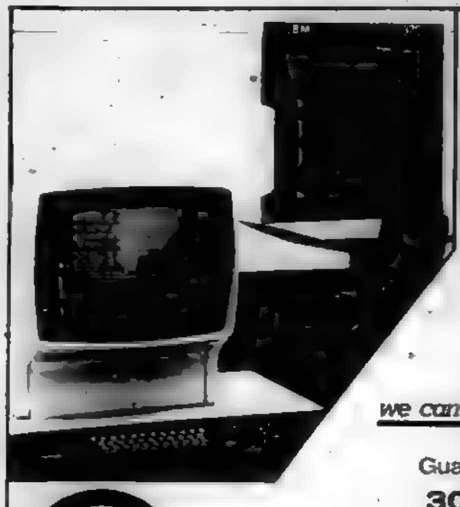
The first step in its process of aid is to help the disabled understand how computers can help them and eliminate any fears they might have about the technology. "The sophistication of computers these days can be frightening to people who don't understand how they work," observed ICE director James Abbey.

"Our goal is to help the disabled in their daily functions, help them become more productive and valuable in employment and help in the diagnosis and treatment of the disability," he continued.

ICE offers products, services and customization of products to suit individual needs. The latter includes software customization, physical hardware mounting services, conversion of systems to different computers and matching complementary products from such companies as IBM, Apple Computer, Inc., Radio Shack and Texas Instruments, Inc.

ICE handles systems that include hearing, speech and language aids; learning disability and mental retardation aids; vision aids; and movement and neuromuscular support systems. ICE also provides consultation services, information searches in most areas of handicapped aids and rehabilitation products and services.

ICE is located at 526 Langfield, Northville, Mich. 48167.



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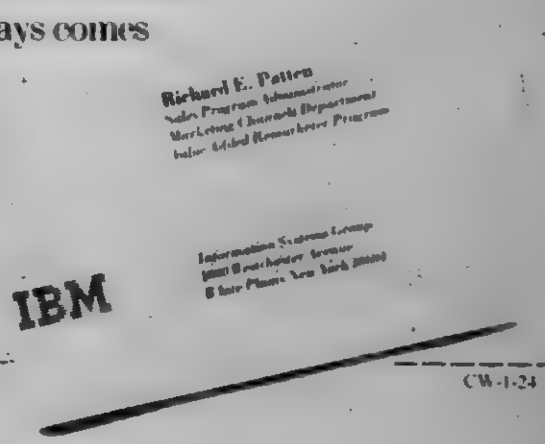

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Softcover, 1,472 pages, $120, ISBN 0-914236-97-0. Knowledge Industry Publications, 701 Westchester Ave., White Plains, N.Y. 10604,

CORPORATE INFORMATION SYSTEMS MANAGEMENT: The Issues Facing Senior Executives
By F. Warren McFarlan
And James L. McKenney

Aimed at senior-level management, this work is an outgrowth of research projects at the Harvard Business School designed to develop strategic planning for information systems. In addition to covering technological issues, the book describes managerial controls, portfolio management in information systems and organizational issues.

Hardcover, 211 pages, $17.95, ISBN 0-87094-347-2. Dow Jones-Irwin, Homewood, Ill. 60430.

CONTROLLING SOFTWARE PROJECTS: Management, Measurement And Estimation
By Tom DeMarco

DeMarco, who has written other books on software systems, provides a pragmatic and objective set of tools and criteria "to replace the traditional wet-finger-in-the-air" technique. He shows how to quantify software systems with *function metrics,* seemingly a combination of operations research and flowcharting, which elicits good models. DeMarco writes clearly, interestingly and often with humor.

Softcover, 284 pages, $29.25, ISBN 0-917972-32-4. Yourdon Press, 1133 Ave. of the Americas, New York, N.Y. 10036.

SOFTWARE MANUAL PRODUCTION SIMPLIFIED
By Richard Zaneski

This book explores software documentation from soup to nuts. Zaneski begins with chapters on creating a documentation policy and developing standards for software manuals. All aspects of research, writing, rewriting, reviewing and revision are covered. This should be a useful book for technical writers, editors and publications managers.

Hardcover, 190 pages, $20, ISBN 0-89433-180-9. Petrocelli Books, Inc., 1101 State Road, Princeton, N.J. 08540.

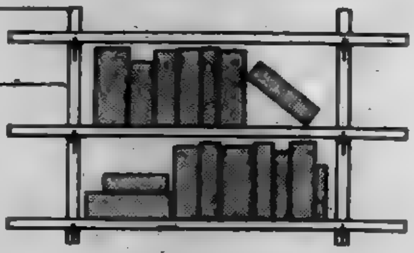
GRAMMATICAL MAN: Information, Entropy, Language and Life
By Jeremy Campbell

This is a fascinating study of information theory, which evolved with the development of radar during World War II. Campbell asserts that information theory disputes the concept of entropy in that we can make order and sense out of life — whether organic or man-made — using information theory tenets. Symbols, messages and codes are common not only to computers and communications, but to living organisms and the essential nature of human knowledge. The author thus defines the universe as "grammatical" — hence the title. A challenging, thought-provoking work.

Hardcover, 319 pages, $15.95, ISBN 0-671-44061-6. Simon & Schuster, 1230 Ave. of the Americas, New York, N.Y. 10020.

SHORT TAKES

THE COMPUTER ESTABLISHMENT
By Katharine Davis Fishman



A definitive work on the computer industry, excerpted in *Computerworld's* "In Depth," Oct. 19, 1981, is available in paperback.

Paperback, 470 pages, $7.95, ISBN 0-07-021127-2. McGraw-Hill Book Co., 1220 Ave. of the Americas, New York, N.Y. 10020.

ITT: THE MANAGEMENT OF OPPORTUNITY
By Robert Sobel.

The inside story of ITT, the world's largest conglomerate, by the author of *IBM: Colossus in Transition.*

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ACM Schedules Sigcomm '83 On Protocols

AUSTIN — The theme of Sigcomm '83, slated here March 8-9, is "Putting Protocols to Work." Sponsored by the Association for Computing Machinery (ACM) in cooperation with the University of Texas at Austin, the conference will feature 12 technical sessions and panels on the status of network architectures and implementation experiences.

Session speakers include Vinton Cerf of MCI Communications Corp., Louis Pouzin of Cnet-France and John Shoch of Xerox Corp.

The fees for tutorials are $70 for ACM members and $85 for others who register before Feb. 11. The symposium fees are $110 for members and $125 for nonmembers after Feb. 11. More information is available from Rebecca Hutchings, Honeywell Information Systems, FSD/MS1003, 7900 Westpark Drive, McLean, Va. 22101.

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DOS to MVS:

Not Just a Technical Change

By Peter Tanquay

An aging operating system poses a threat to DP management, just as the crumbling foundation of a building threatens its owner's investment. Granted, years of hard work have contributed to the stable DOS environment at many installations. And migrations are notorious for project (and problem) overruns, often shooting the budget sky-high.

But how much more growth can the business absorb under its current system software and associated hardware? Will this resource allow expansion into new dimensions of data processing, such as multiple on-line systems, distributed data processing and the latest hardware? How long will it be before the operating system threatens all other areas of DP and the business?

Most DP departments that are using IBM or IBM-compatible mainframes are using either a DOS-based (DOS/VS or DOS/VSE) or an OS-based (OS/MFT, OS/MVT, OS/VS1 or MVS) operating system, of which MVS is the most advanced release. IBM has made a significant effort to relieve as many

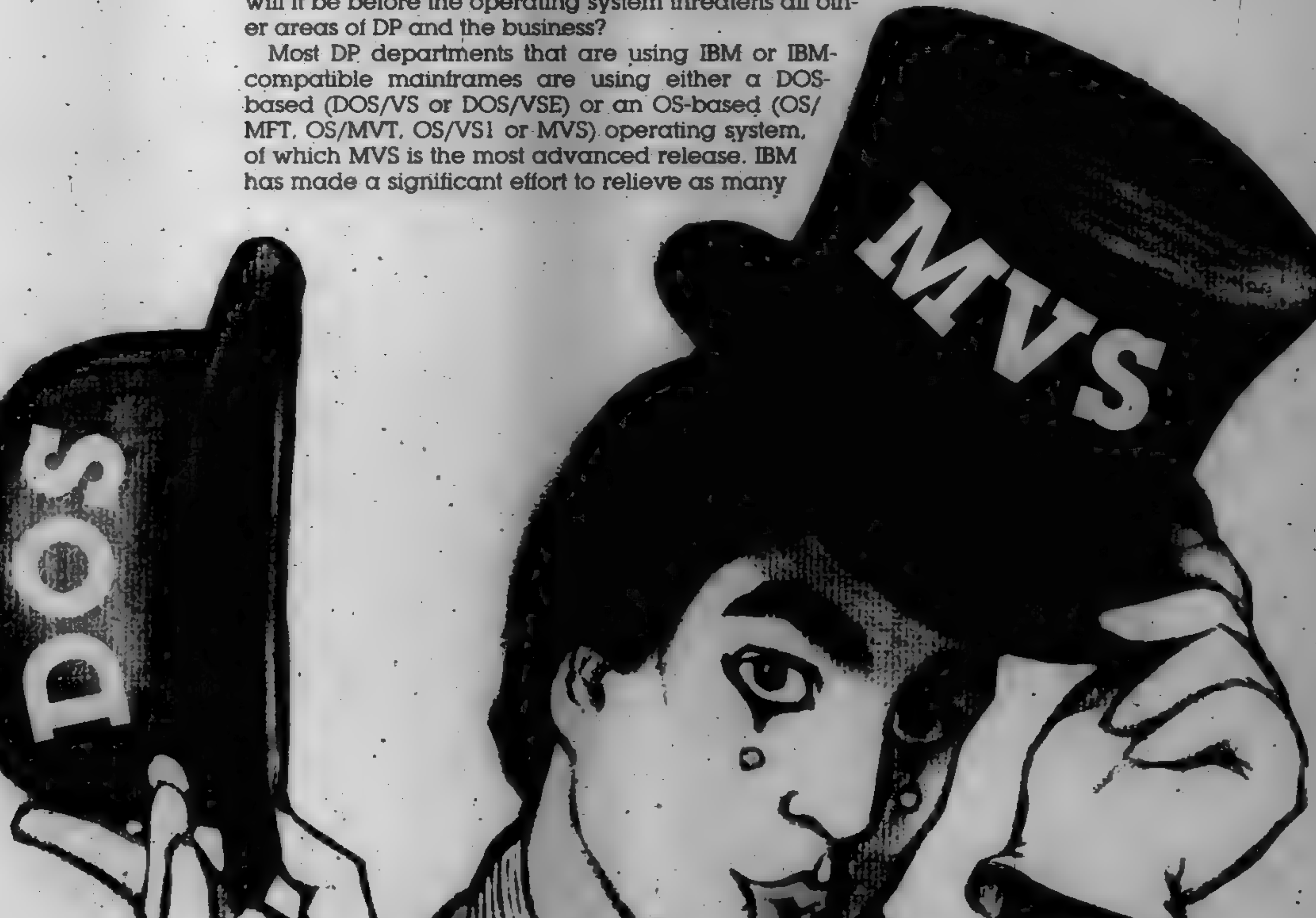

ILLUSTRATION BY JAMIE HOGAN

people as possible of the DOS operating system in favor of MVS and this effort has been complemented by major software and consulting firms.

IBM is looking to MVS to provide the base for future information processing. Distributed processing, fourth-generation application development tools, information centers and the automated office cannot depend on a DOS-based system to provide a firm foundation.

MIS managers considering a DOS-to-MVS conversion often concentrate their attention on systems software considerations. After all, there is plenty of information available in this area. But a sound migration plan is more than simply a technical project. It encompasses philosophical issues, training and production requirements and management concerns such as the budget, long-range planning and user satisfaction.

The amount of upper management foresight in the business is directly related to how difficult the DOS-to-MVS conversion will be. From a management perspective, technical considerations will fade fast alongside issues of budget, staffing, user demand and satisfaction, direction and business philosophy.

Long-Term Planning

A migration from DOS to MVS poses many challenges to a DP five-year plan. First, consider the budget:

- The OS version of most software products (whether from IBM or an independent company) costs significantly more than the DOS counterpart (if one exists).
- Experienced applications and technical staff demand a higher salary, in some locations are harder to find and cost more to train.
- The MVS system will require more hardware resources, especially direct-access storage devices (Dasd) and memory. It may also be necessary to add staff to support the same application systems that were supported by the DOS system and staff.

These and other areas of the budget will probably increase during a migration to MVS. The budget increase, however, coincides with additional requirements and growth in other areas of data processing that were supporting factors for considering MVS in the first place.

A second consideration, timing, may be the most critical element of a DOS-to-MVS migration in terms of business needs and the ability of the information systems to respond to them. Timing will also influence the DP staff's acceptance of the operating system change. One of the best reasons *not* to migrate to MVS is a DP staff that is split over the issue. If the business will be patient, it may be wise to postpone the migration in order to educate the staff and establish a consolidated management direction. Migrations require everyone's support.

Timing from the business standpoint will be led by an individual or small group of individuals who anticipate the system requirements so that migration is either complete or nearing completion when the DOS system reaches the point of diminishing returns. The daily responsibilities of most of the staff usually keep them from projecting their future requirements with the lead time necessary for this project. The migration will challenge many areas of the shop (some of which are taken for granted) so there must be time for people to digest the changes, consider and accept the new environment.

User satisfaction and cooperation (in this case at the higher levels) are a third management consideration. Upper management's support is essential, because the migration project is filled with long-term promises and few short-term advantages, especially to people outside of DP. The effort to stabilize application systems while the operating system is being changed is in direct conflict with the dynamic user environment. People expecting application changes may become frustrated and in some cases will pursue alternative methods to fill their requests, such as using their own programming staff, microcomputers and so forth.

In addition, an operating system migration often gets "real old" before it is over. The need to obtain upper management support at the outset will become obvious when the project is two-thirds complete and

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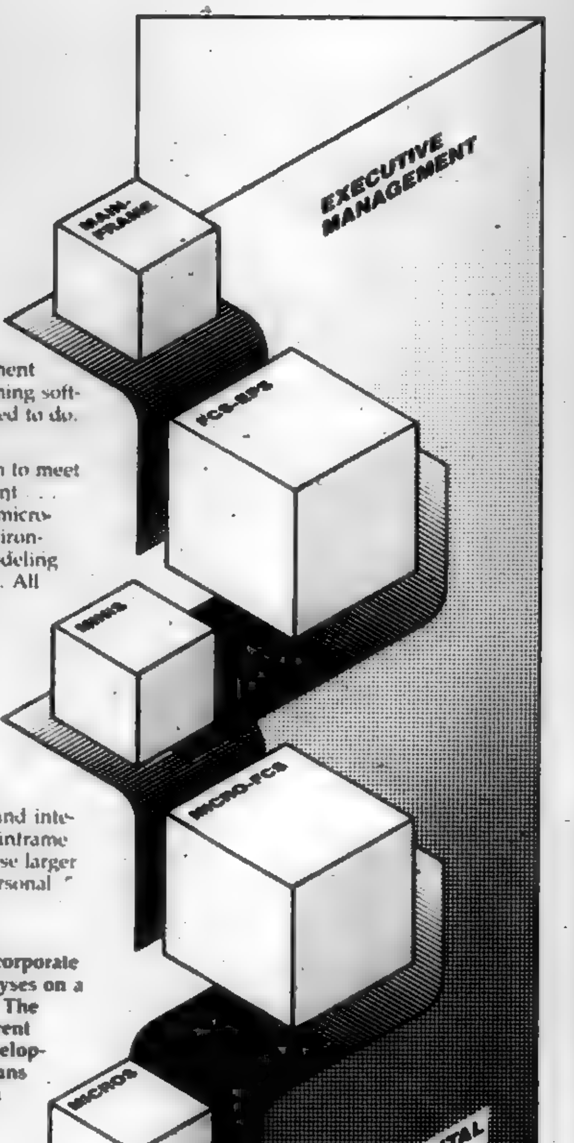

user management is getting anxious about the time it is taking and the lack of any tangible results.

Meeting these challenges requires a good understanding of the information processing direction of the organization, the limitations of the DOS system in pursuing this direction and why an MVS system is the best operating system on which to build your future. If you are not comfortable in these three areas, either postpone the migration or keep DOS.

Principles and Guidelines

Once a preliminary review of the situation has been completed and the decision has been made to evaluate a migration to MVS, there are a few guidelines and principles that should be considered. The first step must be to allocate resources to a planning effort. The objectives of this planning phase are to assess the current environment, analyze the migration requirements and set up a migration plan. The decision to convert or not is made at the end of the planning phase.

Following are the essential guidelines in planning:

1. Allocate a small team to do the planning. Don't involve everybody. Assign the best resources that can be committed 100% of the time. Focus on tomorrow.

2. Take your time. Challenge the assumptions of the current environment. Understand what it is that is being converted. Be objective; get support from MVS people in the community and from your vendors.

3. Identify the business risks that must be minimized and the areas of greatest exposure (length of project, availability of on-line systems, support of current systems, cost and so on). Identify how these risks will be minimized. It is not uncommon to spend six months to a year in planning, so begin early.

4. Define the scope of the migration, which will be dictated by timing, the need for MVS and the corporate setting. Some firms want, above all, to begin operating under MVS as soon as possible. Then a new project is defined to convert the "DOS" systems running under MVS to systems that use the features of MVS. Other companies can afford the time to convert each system to an MVS system, rewriting and modifying programs to conform to new standards and application development guidelines and to take advantage of MVS features. It is important during planning to fence in the migration and develop a well-defined set of major steps for getting there.

As a second guideline, focus on the production perspective. Assume that we divide the DP department into two areas: the systems development and maintenance area and the operations or production group. In most cases, the migration will be led by someone in the systems development area. The changes and challenges resulting from the new environment will be very different to these two groups.

'In the planning group, be sure there is strong representation from someone who focuses solely on the production perspective. This helps keep the migration fenced in to produce first a system that will meet current production requirements.'

In addition, it is not uncommon in a small shop (which would tend to be a DOS shop) for the systems development area to be in the driver's seat for most aspects of data processing.

Furthermore, you can expect to find a difference of opinion about the current environment if the two groups are approached separately. With the above in mind, be sure there is strong representation from someone who focuses solely on the production perspective. This helps keep the migration fenced in to produce first a system that will meet cur-

(Continued on Page 31)

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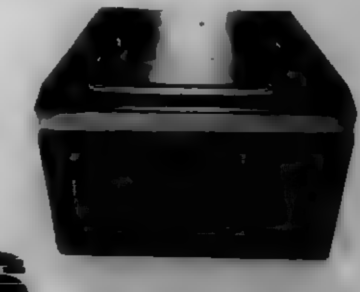

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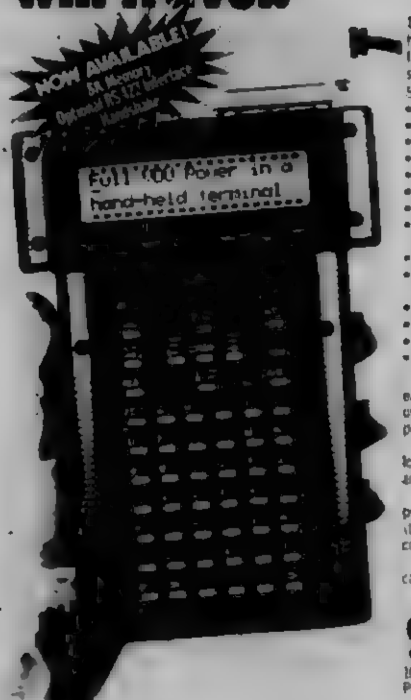

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How a Health Care System Handled MVS Migration

Following is the author's account of his installation's recent DOS-to-MVS conversion.

The Baptist Medical System is an expanding regional health care system serving the state of Arkansas from corporate headquarters at the Baptist Medical Center in Little Rock. In addition to four hospitals in a 50-mile radius, the system includes training facilities in many areas of medicine and handles referrals statewide for complex diagnoses.

The system's fourth hospital opened in 1981, the same year a $23 million addition was completed at the main facility. In November 1982 the system broke ground for a $40 million retirement community.

Automated information reaches almost every function within the hospital system. A teleprocessing network of more than 300 on-line devices at four locations is CICS-based from an IBM 4341-II at a central site running MVS. A backup IBM 3031 provides security in case of a CPU outage and also serves as an applications development machine.

The decision was made to migrate to MVS from DOS/VS in the fall of 1980, before we added our fourth facility. We had to upgrade from DOS/VS to DOS/VSE or consider a migration to an OS operating system. Expansion plans, security demands, the importance of system reliability and the capability for distributed processing made MVS the clear choice.

In a meeting in February 1981, we identified our potential constraints as follows, in order of magnitude:

- The existing operating environment presented problems. The CICS network provides on-line service 22 hours a day, seven days a week. Batch processing had filled up the production schedule, leaving little room for additional work. An error, rerun or system outage often produced a ripple effect in the rest of the production schedule.
- The organization planned to grow (the first addition turned out to be the fourth hospital that summer).
- IBM support had run out for the DOS/VS operating system and the Vtam release we were running (which could not be upgraded without a new operating system). This situation put our systems software in a tenuous position.
- It was clear that we would have to add more Dasd, memory and available CPU cycles to complete the migration.

We reviewed the constraints and drew up a project plan using the IBM DOS-to-MVS Structured Support Plan (SSP). We felt that the following objectives should be met in order to minimize the risk and the impact on the user environment:

- Complete the migration by fall 1981.
- Convert the systems as they were, not rewrite or modify them during the migration.
- Freeze application changes where possible.
- Dedicate a project team 100% to the migration.
- Use existing personnel where possible and add some people with MVS experience and skills.
- Keep the migration transparent to the user community.

Of an application staff of 10, we dedicated four to the migration full-time. When the new facility was added in the summer, the effect on the migration was kept to a minimum. We were not able to dedicate this level of resources in the technical area, which was to our disadvantage.

We chose to use the UCC product, Duo, which allows us to run DOS object code under MVS. I feel that this was a very good decision, especially considering the time frame in which we expected to convert. We are now converting programs that are using the Duo interface without the time pressures and exposure that existed during the conversion.

Once the migration began, rather than freeze all of the changes, we found that a good method of tracking changes kept the migration more transparent to the user community and kept the exposure from changes to a minimum. In addition, when MVS became the production system, our backlog of requests was smaller.

Our largest variance from our initial objectives was in the length of the project. Our final cutover did not occur until May 15, 1982. However, the cutover had minimal impact on the user community. The delay had many causes, but the key is that we did not cut over until we had great confidence that there would only be one cutover.

In terms of hardware, we began with a 3031 with 4M bytes of memory and 6G bytes of Dasd storage running DOS/VS under VM. Our intent was to migrate to MVS using the 3031 with MVS and DOS running under VM. As the migration progressed, it became clear that this configuration would be inadequate. We completed the migration with a 3031 and a 4341, both with 8M bytes of memory and 11G bytes of Dasd storage, running two copies of MVS in a shared catalog environment.

MVS is providing the systems software base for our application systems that we had expected. Operations and applications personnel have come through the migration quite smoothly. The technical support area is where it has been most difficult to find qualified personnel.

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(Continued from Page 29)

rent production requirements.

Here, production refers to batch systems and on-line system monitoring by DP personnel. The on-line network from the users' perspective is buffered by the teleprocessing software, which is not a big change from the DOS operating system to MVS. The batch production arena requires well-defined training programs and will feel the effect of DOS-developed systems running on a new operating system. The operations group tends to be less educated in DP in general and will not be able to allocate people to the new system as easily.

New development can be postponed much more easily than current production requirements. This is emphasized because the production personnel and production issues are often forgotten as the applications personnel convert "their" systems. In some cases, a phased applications approach may be best to ease the changes on the operations staff.

No Substitute for Expertise

A third guideline is to get MVS experience. Don't expect the DOS-trained people to be able to establish an MVS environment. There are too many basic differences and techniques that will cause the new system to be awkward and too much of a hybrid. In addition, the staff will be very protective of the methodologies that worked well with DOS, but may no longer be suitable.

The process of acquiring MVS experience could be the most significant part of MVS migration planning. Do not exclude current staff members, but do make sure that the MVS experience is strong enough to support the design and objectives of the MVS system and to counter the leading personnel in the shop if their DOS allegiance poses a conflict. If it takes an expensive consultant, hire one. If the migration must be delayed to educate personnel, take the time.

To illustrate the magnitude of the difference, compare DOS to a fast car and MVS to a jet plane. If the objective is to go from New York to San Francisco, the old mentality would drive the plane at 400 miles per hour on the ground. It takes a new perspective and set of techniques to lift the nose off the ground and fly.

A fourth principle: Don't try to track the migration manually. The planning phase fenced in your objectives and defined your areas of exposure. In the next phase, fully define the migration at a task and program or system level. Again, be sure to look at the tasks from both a production and development perspective.

Then automate! When the applications systems are disassembled, you should not have to rely on manual methods to give your status. Automated tracking and status reports are essential to maintaining control of the project. There are many software tools for project planning on the market, but in some cases, developing your own may be the best approach. Moreover, as the MVS environment becomes more defined through implementation, it is important to cross-reference systems running on both operating systems.

As for Hardware . . .

In the area of hardware, here are a few suggestions. Do not underestimate the need for hardware resources, especially memory and Dasd. Remember, for a while, there will be two systems running. On-line editors used for MVS program maintenance will provide more functions than the DOS counterparts, but they will also use more resources. With deadlines for system conversion, the on-line work load will also increase. This may put a strain on your existing system.

For testing, on-line editing and compiling, the need for Dasd, memory and CPU time is staggering. Evaluate how much the current environment can afford to be degraded during testing of the new system. Also, how well can they be scheduled around one another? An MVS environment running with a DOS environment during a conversion will require much more than twice the DOS environment. Exactly how much more depends on the shop.

In summary, a DOS-to-MVS migration should begin with an exten-

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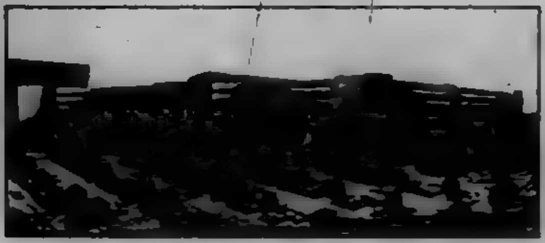

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sive planning phase, when the DOS environment and the costs and results of an MVS migration are fully analyzed.

Be sure to focus on the production environment in the short term as well as the application systems in the long term.

Automate the conversion process where possible to increase your understanding of what is happening and to provide status information throughout the project.

Resources

What is the most painless route to restoring the technical foundation for application systems that will allow for the organization's growth and long-range DP plans? An examination of the resources available to assist in a conversion will tell a story in itself.

During the planning phase, an extensive review of the services and tools available will provide a foundation for understanding the tasks and issues at hand. Following is a partial list of resources:

1. Consulting firms will send information-gathering forms and/or spend time with you to evaluate your situation. This process is helpful whether you decide to enter into a contract for their services or not. They will help put a fence around the migration and allocate resources for the conversion.

2. The DOS-to-MVS Structured Support Plan (SSP) from IBM is a tool that walks through the planning and preparation stages by using the Project Evaluation and Review Technique (Pert). This tool is a result of IBM's recent emphasis on converting as many DOS customers to MVS as possible. The product takes advantage of the experiences of some of the foremost authorities within IBM on the topic. The package includes a sample MVS standards manual, a conversion team users' guide, a project managers' guide and a Pert chart with sample migration activities and events. These are all available in machine-readable form to be tailored to your installation and they focus on the managerial and project leader aspects of the migration.

3. There are a number of conversion tools for job control language (JCL), and these should be reviewed closely. One of the major changes for the applications personnel is in the area of JCL. A conversion tool will relieve most of the manual effort in converting the JCL and will provide an excellent framework for training and cross-reference of DOS to MVS JCL. Conversion tools are also available for source programs.

Many documentation tools will provide flowcharts, cross-reference reports and so on from conversion activities and/or JCL. These are very important. MVS JCL has much more job information in it than DOS and can be analyzed to provide high-level system information. When looking for these tools, review those designed for the MVS environment in addition to tools that are marketed specifically for a conversion.

4. Take a close look at MVS system management software such as tape management systems, disk management systems, job scheduling systems and restart/rerun control systems. The MVS environment handles these activities much differently than DOS, and an examination of these products can illuminate many of the differences to help change your mode of thinking to match the assumptions and opportunities of MVS.

5. A final product worth mentioning is the UCC2 product (Duo) from University Computing Co. This enables DOS object code to be "Duo-linked" under MVS and run on MVS using Duo as an interface. This has many benefits for companies that have distributed DP centers and do not want to convert all of them to MVS; companies that have time restrictions for eliminating DOS; companies with very dynamic or extremely critical exposure levels; or companies that have many systems that will be replaced in the near future and do not merit the conversion effort.

In summary, many people have invested a lot of energy toward providing a means for migrating from DOS to MVS and managing the MVS environment. Take the time to understand these offerings. The education and documentation alone will

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make the process worthwhile. And again, IBM is most interested in your conversion and has much to gain from it. Be sure to utilize its resources: at this time of hardware and software expansion, the leverage with your vendor is at your advantage.

Final Cutover

There are various methods for cutover to MVS: by system, by groups of related programs, by schedule and so on. Two recommendations here: Give adequate lead time for testing to uncover inconsistencies and make one cutover for each unit. Do not straddle the fence too long or go back and forth between systems. If you do, you will get stuck and the integrity of your data and the momentum of your staff will be endangered.

Postpone the cutover until the probability of success is very high. The on-line systems at first appear to be more difficult than the batch, but my experience was that the batch systems involve a greater change and are more difficult.

Once MVS becomes the host operating system and DOS is history, the opportunities open wide. Management is presented with putting together a new organization to develop and exploit the new DP environment. This may mean new positions and responsibilities and increased staff.

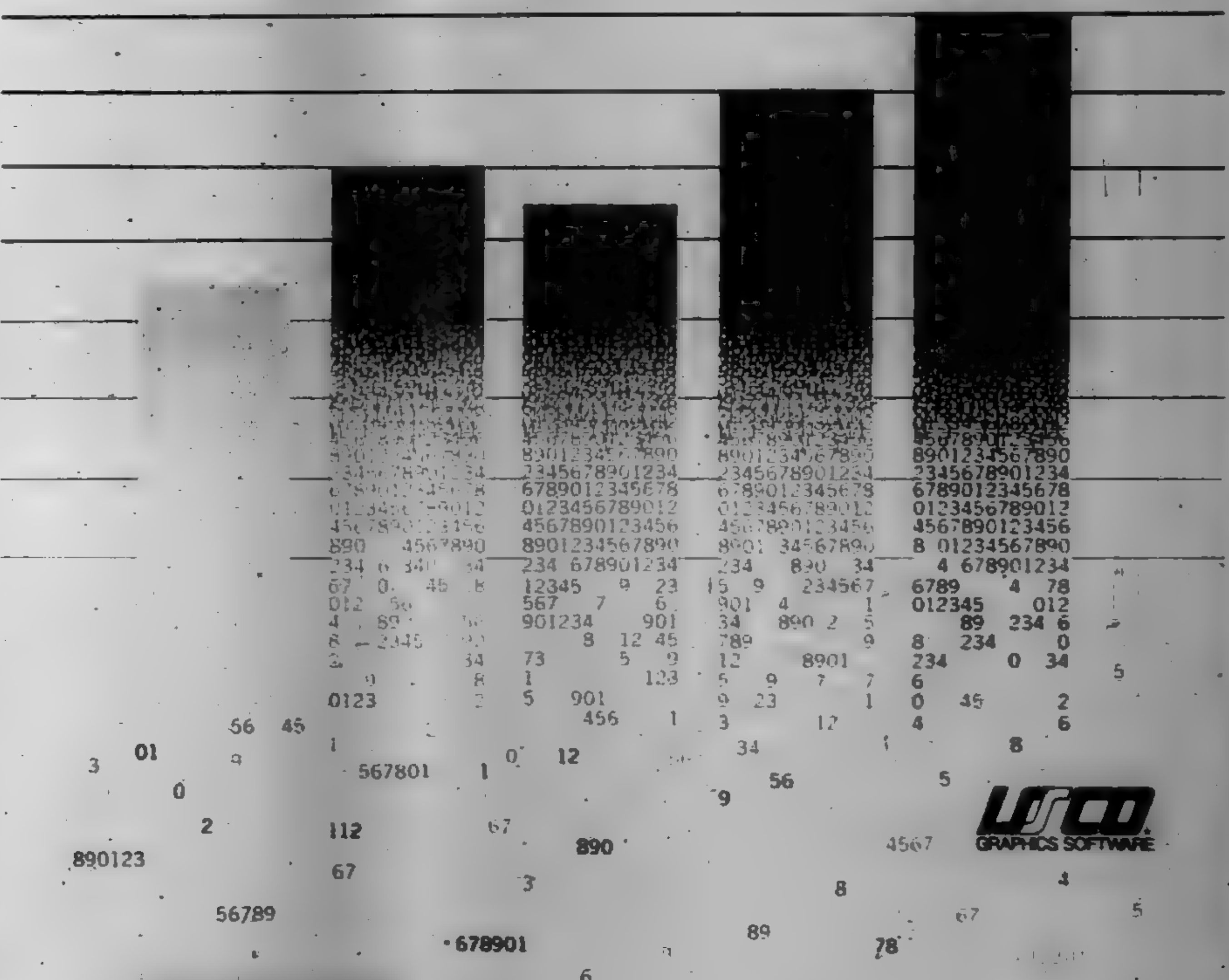
Operating system standards and procedures, capacity planning, change management, and system performance and accounting issues are very important. Whether or not these were adequately dealt with in the DOS environment, the system has changed and they must be reviewed along with the other DOS assumptions and procedures. The basis for review should be one of the migration's results.

Management must realize that the learning curve and the processes of refinement in these areas were quite mature in the old environment from years of experience. Don't try to cement all of these procedures, standards and policies until the MVS learning curve begins to level off and the personnel in your shop have had an opportunity to participate in refining the environment in which they will work. It takes time to change completely those familiar habits and techniques that worked so well under DOS and to develop sound methodologies to use the features of MVS.

Remember, the objective of the migration was to provide a foundation on which to build your systems future. That task is now at hand.

About the Author

Pete Tanquay has worked in data processing since 1976. He is currently supervisor of special projects at the Baptist Medical System in Little Rock, Ark., where he recently was responsible for a DOS-to-MVS conversion. Previously he worked for Storage Technology Corp. in Louisville, Colo., doing data base design and programming.



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EDITORIAL

In Search of a Measure

Productivity has become to DP what team spirit has long been to sports: something everybody wants, but nobody knows how to measure.

A majority of DP managers recently surveyed by *Computerworld* said that although they are actively looking for ways to improve programming productivity, they know of no definitive way to evaluate those improvements [CW, Jan. 17].

In the salad days of computing, productivity was effectively measured by counting lines of code or measuring the time required to produce an application. But application generators and high-level and nonprocedural languages have rendered such measures useless. "We've got some small programs that are absolute bears and large programs that we can give to trainees," the manager of one large installation said.

Attempts to develop a standard of measurement continue. One method proposed by Allan Albrecht, IBM's program manager for application development and maintenance measurements, and endorsed by productivity authority T. Capers Jones, involves counting the number of external user inputs, inquiries, outputs and master files delivered by the development project. The counts are weighted according to a formula developed by Albrecht which, he said, gives "a dimensionless number defined in function points, which [is] an effective relative measure of function value delivered to our customer."

Albrecht's function point method is probably as good as any. But from a practical standpoint, we question whether the benefits of a standardized productivity measure warrant all the fuss.

Anyone who works in DP today is familiar with the syndrome known as the "software bottleneck." The volume of applications demanded by users simply exceeds the amount of programming and machine resources the DP shop can offer. Managers needing productivity aids are too busy finding something to relieve the backlog to worry about quantifying the benefits of new technology. They are not likely to fiddle with formulas while Rome burns.

We believe large shops increasingly will come to emulate the methods of smaller installations. In many of those, the ability of programmers to meet goals on time and within budget is weighted far more heavily than lines of code produced.

"We're expected to produce 100%, even if it means working weekends and nights," said the director of a small installation at a California lumber company. "All results have been what they should be: no downtime, no reruns, no edit runs and no blackouts because of errors."

Of course, the job of evaluating performance is easier for the small shop. But the objective approach is one that could benefit even the largest installations. DP managers need a productivity measure that evaluates results, not input.

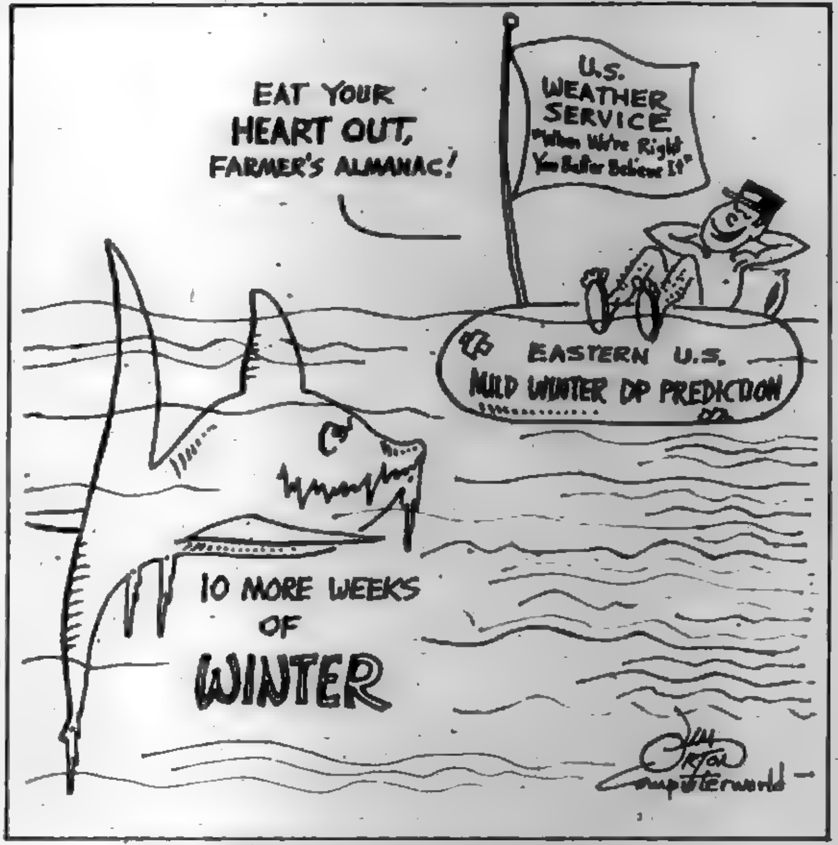
DATA PAST

Five Years Ago
Jan. 16, 1978

NEW YORK — After three years of harassment that included six lengthy police interrogations as well as apartment searches and seizure of personal papers, Dr. Valentin Turchin, a noted Soviet computer scientist, arrived here with his family.

Ten Years Ago
Jan. 17, 1973

GAITHERSBURG, Md. — No single interface standard should be developed for all peripheral equipment, but the government should develop selected standards in the tape and disk area, a National Bureau of Standards draft report said.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The Premature Prognosticator

LETTERS

Validity Studies

It is not surprising that a test publisher like myself would find the editorial "How Unfair Is Testing?" [CW, Dec. 6] enlightened and insightful. I would like to add some factual words of hope and comfort to would-be programmer aptitude and proficiency test users who are concerned with validity studies and legality.

First, "validity generalization" is a procedure for relying on the combined results of previous validity studies conducted by diverse organizations on the same test.

Use of validity generalization was successfully supported in at least two court cases that I know of: Friend v. Leidinger (1977), which involved racial discrimination charges against a fire department in Virginia; and Peques v. Mississippi State Employment Service (1980), which involved race discrimination and sex discrimination charges.

These cases did not involve programming tests, but I am sure that validity generalization (if high) is an appropriate procedure to support the use of tests for selecting programmer trainees and experienced programmers. (Validity generalization for our Berger Aptitude for Programming Test, for example, based on 16 validity studies, is very high: .74.)

If you select a test with a high validity generalization, then you should not have to conduct your own validity study.

Second, "consortium studies" are another means of avoiding costly and time-consuming within-organization validity studies. An association of banks, for example, can do a joint validity study with just a few programmers from each bank participating. The cost is fragmented and small for each participating organization.

Finally, "validity transportability" is an Equal Employment Opportunity Commission-approved option in which one organization can use the test validity results of a study done by another organization because essentially, the programmer job descriptions of the two organizations match.

I believe that these alternatives to large-scale test validity studies make the DP personnel testing situation much less grim.

Frances R. Berger
Co-Publisher, The Berger Series
Of Computer Personnel Tests
Psychometrics, Inc.
Santa Monica, Calif.

DP Library Tips

As a holder of an M.A. in library science and a B.A. in computer science with experience in both fields, including setting up a library, I would like to expand on the answer given by Larry E. Long regarding a DP librarian in Turnaround Time [CW, Dec. 13].

There are many trade journals and other sources in library science that will help identify relevant literature dealing with DP and information systems.

In addition to this, there are indexes available that cover many of the current issues of journals.

With regard to acquisition, there are vendors and library journals that regularly announce forthcoming books and other materials prior to publication, often with reviews of prepublication copies.

Perhaps consideration should be given to sending the DP librarian to school to pick up some of the basic courses on cataloging, reference and acquisitions.

Felix T. Chu
Systems Division
Nebraska Department of Revenue
Lincoln, Neb.

LECHT ON SCIENCE /Charles P. Lecht

Rebundling — This Time It's Here to Stay

Rebundling — or, perhaps more precisely, "de-unbundling" — is taking place before our very eyes. And this time, it's for keeps. Usually reserved for the process of packaging hardware and software for sale as a single unit, bundling, this time, will encompass a lot more. Because of this, we may not recognize today's bundle as such, but a bundle is a bundle! If you have trouble identifying one, retention of a local hobo as an expert consultant may not be a bad idea (if each bundle-buying employer hired just one unemployed hobo . . .).

In 1969, IBM was pressured to unbundle its software — an act that, in the event, does not seem to have caused it too much pain. Separate pricing emerged.

That the "no bundling" adjuration applied only to the eminently successful companies offers a (doubtless unintended) insight into what our regulatory watchdogs thought of other companies in our industry. Either much smaller, or faltering, these relative "small-timers" were left alone on the assumption that their bundled operations were more threatening to themselves than to anything or anyone else.

It came as no surprise when they, too, eventually saw the wisdom of unbundling, but this spoke less to the kind of companies they were than it did to the kind of company they aspired to keep!

It had become impolitic for a really successful computer systems manufacturer to offer hardware, software and services in a bundle without indicating separate pricing for each and allowing purchasers to buy any one without prejudice to those purchasing all.

A Fragmented World

After 1969, we lived in a world that could only be viewed by our government's regulationists as beautifully, even opulently, fragmented. Our data was processed and/or communicated courtesy of a commune of manufacturers linked by commercial necessity. Product offerings were delineated according to supersets of their components: peripherals, software, CPUs, services and communications. And we've sold these on a separate pricing basis for so long that it's possible we've forgotten what bundling was in the first place.

For example, however large or small in number or differing in nature the parts in today's computer systems hardware environments, their packaging and sales literature never use (or even imply) the unseemly word "bundle" (perhaps it should henceforth appear in our text as "b——"). Even if each part were made by a different manufacturer, from a marketing and sales standpoint, the need for a unified product image would never admit to stooping to the undignified level evoked by the term "b——."

Succumbing at worst to the "package" label, today's products are usually described in more elegant terms, like "synergetic systems," suggestive of the kind of interactive harmony encountered only in organic life. If "package" must be used, "integrated package" is generally preferred, in order to imply that its parts are not just lying about in a box, nor enjoying the same relationship to an organizing principle as a Russian granny's collectivized brain does to her babushka.

A Conceptual Boundary

This issue is one of such sensitivity that we have created a conceptual boundary for ourselves, within which our definitions of computer technology components must fall if they are, when taken together, to qualify for the more highfalutin "system" title.

Take, for example, IBM's System/38. Sold with one piece of software alien to its product definition, honest persons would be compelled to refer to it as the "Bundle/38." Can you imagine an IBM salesman speaking of b——s to manicured corporate management disdainful of anything so conceptually haphazard or unkempt?

But unlike the past, today's reb——ing isn't happening to aid the conduct of pricing shell games by our industry's leader. For as our computer industry races into synthesis with our communications industry, a lot of heretofore independent, but computer-technology-related, things will be tied together in integrated services digital networks (ISDN).

By its very nature, ISDN technology integrates into a unified whole previously disparate technologies, bringing to users the power that computer systems provide. The reb——ing results, therefore, from a natural synthesis of previously individualized services, with products both hard and soft, affording great economy of scale. And as the products and services of parties contributing to the creation of dial-tone or power-line hum have been lost from view, so will the now-familiar unb——ed product definitions vanish as our reliance upon massive service bureaus of ISDN origin inexorably grows.

AT&T with NET/1000, IBM with Information Network, Warner-Amex, Citicorp, General Electric Co. and others are creating ISDNs; their embryos are now in place. Users will be compelled to abandon the do-it-yourself-kit nature of past computer systems offerings for the highly potent and inexpensive services in these networks. The relief these services will inject into DP environments will far outweigh whatever measure of comfort users might derive from their purchases of competitively priced, unb——ed alternatives.

Die-hard holdouts and other skeptics will become converts when they realize that great savings can be achieved through network access to data bases whose creation and maintenance on an individual, data center basis is prohibitively costly.

Creative Tie-In Plans

Until that glorious day when the promise of ISDN technology is realized, accelerated reb——ing will occur. And in our new, free-swinging competitive economy, creative tie-in plans are inevitable.

Appearing first as liberalized contractual terms, reb——ing will eventually come to include free personnel support, a promise to upgrade on-premises hardware at no apparent

(Continued on Page 36)

HUMAN CONNECTION /Jack Stone

Collegians Not Worried About Job Prospects

This is the second article in a six-part series, "Computers and the Collegians," coauthored with Joanne Barker.

With all the sorry news about the worst unemployment since the Great Depression, one would think that job uncertainties would have college seniors shaking in their boots. Not so, much to our surprise. In this column, we describe how some seniors are, using their vernacular, "cool" with respect to job prospects.

Pearl Marshall, a computer science major at a small private college, chose a major in computer science because the field is "where it all is."

"Computers are amazing machines and supply valuable services. From all the recent advertising hullabaloo surrounding micros, I assume they're being purchased in vast quantities. Obviously, a lot of people are needed — now and in the future — for systems design and programming of these machines, and this motivates me to enter the profession.

"My interests in the field are not based on fads or considerations of glamour. I believe that just as electrical engineering, accounting and other vocations lost their glamour after they started to mature, so too will the area of computers. After all, computer applications in the public sector have been routine for a long time and represent, in a sense, only the latest technological happening of our society. No, I truly believe that a computer career is the best vehicle for meeting my professional aspirations and salary goals."

Widespread Talk

"I'm also encouraged by the widespread talk about computers," Marshall said. "Everyone seems to have computers in his conversation. I don't mean just on campus, either; I hear about it at home from my dad, who still believes they are too expensive for his business, and from such people as the pharmacist in the corner drugstore who wants me to help him install one to keep track of orders. Computers, I believe, are the wave of the future job market."

Robert Stewart, a philosophy major at a private college, had a different view, based on his desire both to concentrate in a liberal-arts field and to take some computer courses along the way only because of their general utility.

"Today, computers are a given part of our campus, our home life and our working environment. They are not perceived by students as they are by many in the population at large, namely, as mysterious creatures that swoop down on the nations of the world and subjugate the minds of men.

"The cold facts are that most students, except perhaps the computer science majors, are totally cognizant of the many computer-type jobs 'out there' and want to expand their knowledge of the new technology and improve job skills. But the typical student will not go much beyond the basic courses if the instructional program is so poorly organized as to jeopardize his grade point average."

Twenty Years Ago

"Twenty years ago, deciding on a computer career was like deciding on a career as a physician: In both cases, you were looking at a lot of hard work, long hours and great expense," Stewart said. "Now, we look at computer people as operators of electronic steam shovels, pushing trash heaps of data around from one pile of information rubble to another. Frankly, I'm not too enthusiastic about becoming a data mechanic even if it does pay well, and if my dad takes me into his business, maybe I won't have to.

"College is too important to me to waste my time fooling around with some Fortran program in a course taught by an instructor who would prefer being away from the classroom spending his time fooling around with his own Fortran program. I would rather invest the few precious years I have in college reading Socrates and discussing his perceptions of morality. Sure I'm sorry I didn't do better in the DP intro courses I've had so far, but they were not very practical anyway.

"I figure I can always pick up the basic skills I need to run one of the electronic shovels after graduation by taking some adult education courses at the local junior college or spending a few weeks on a friend's Apple [Computer, Inc.] computer. What's more, I would expect my future employer to train me in what I don't already know."

LETTERS

Burying Myths

I enjoyed reading the article "Computer Industry Layoffs Widespread, Varied as Electronics Unemployment Jumps to 13.1%" [CW, Dec. 27/Jan. 3]. A very clear cross-sectional picture is given in the article of what has been happening to DP "job stability" as people in the industry would have us believe.

Yet, the plight of those 40 years old and older is tougher than the conditions that are indicated by the article, though Ron Armstrong of Armstrong & Associates in Houston hinted at their fate.

There were also several employment myths restated by Jo-Anne Rudolph, account executive with Compusearch Agency recruitment firm, and the Boston employment counselor. The first myth is "Generally speaking, those laid off are deadwood or incompetent."

A number of questions can be raised with respect to this myth: What is the definition of "deadwood" and "incompetent?" What constitutes evidence of being deadwood and incompetent? Upon what basis is this evidence adjudged?

Other myths brought out in the article are "those who are really good are not part of the layoff picture" and "the good people will have no trouble finding a suitable position very quickly."

These comments, however, beg the question of what "good" means. Other questions that come up are: Who decided who is "good" and who is not? What standard of measures was used? How were judgments made, and by whom were the judgments made? What was the caliber of those that were doing the judging?

Before these myths are bandied about as though they represented both valid and sound judgments, a close analysis of them, in addition to perceptive thinking about them, is necessary.

If there is no such analysis, the fallacies of these myths will continue to deceive and mislead us and to generate incorrect conclusions.

It is high time such myths were understood as the cliches they really represent and be buried with enlightened perceptions once and for all.

John Callahan
Arlington, Texas

Rebundling Here to Stay

(Continued from Page 35)

cost, discounted software, free on-line/real-time diagnostics for those who wish to dock their computer systems at ISDN ports and preferential treatment for ISDN clients who bought the whole kit and kab-----.

The latter group, provided with the benefits of "green-stamp" credits, the redemption of which will entitle them to reach out and touch someone for the cost of a gherkin, constitutes the vanguard of 21st century computer systems users.

For before the year 2000, we will have decommissioned today's corporate data processing facilities, replaced them with a mass of function-specific terminals and, through the function-specific terminals, linked our companies, our homes and ourselves to massive ISDN supercenters.

The process of reb----ing will have reached its logical conclusion. And, with ourselves woven into the resulting bundle, we may pronounce it, at last, respectable.

Charles P. Lecht is president of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

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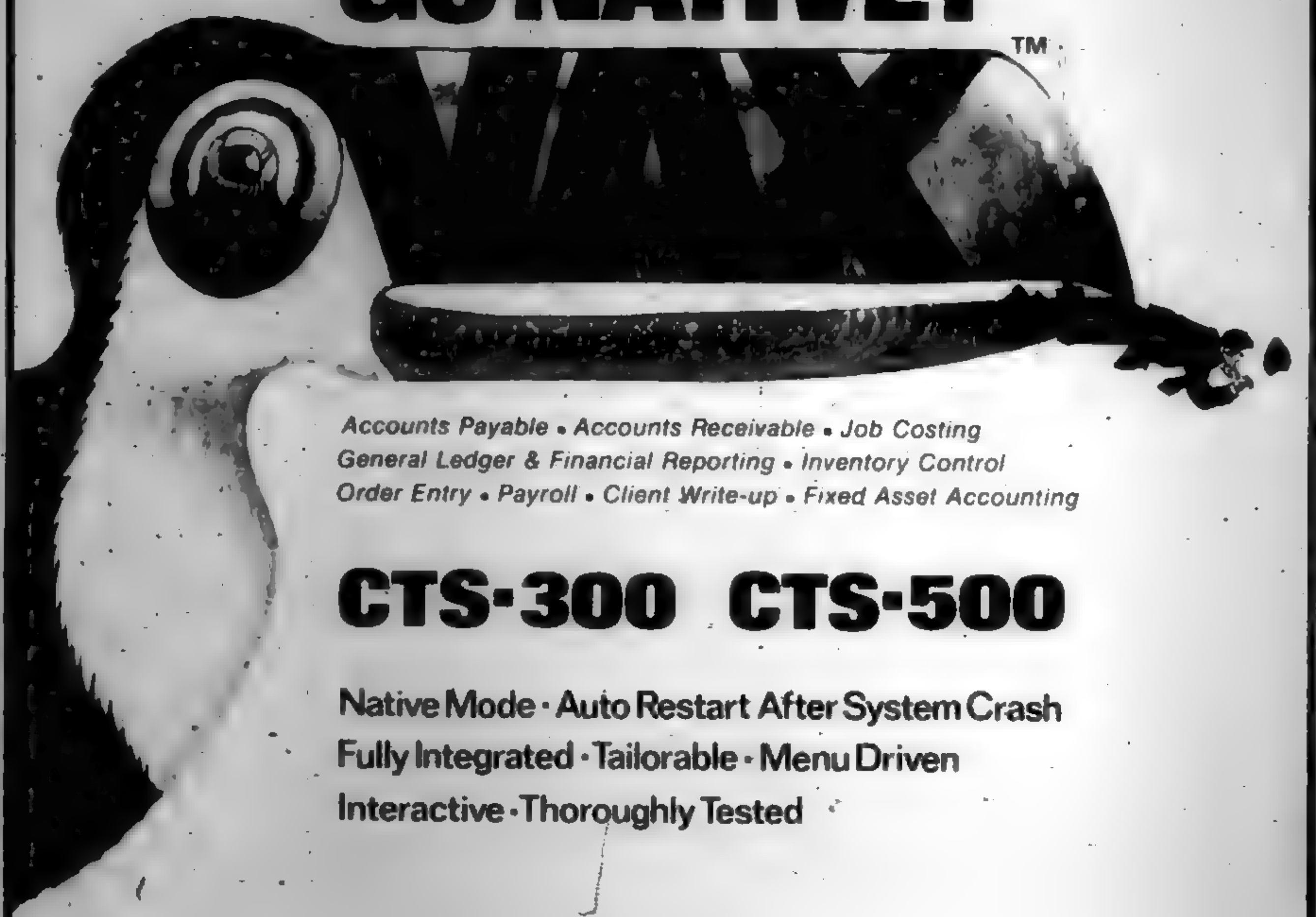

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Handles Money Market Accounts

Bank DP Service Firm Weathers Change

By Lois Paul
CW Staff

BRAINTREE, Mass. — When deregulation allowed banks and savings and loan institutions to introduce money market savings accounts and Super Now checking accounts in December and January, a group of New England banks were ready — in fact, they had been ready for nearly two years.

Mutual Services, Inc. (MSI), a firm that provides DP services for many banks in New England, had anticipated the move toward money market accounts and had begun work on changing the software to meet these requirements as early as January 1981, according to Executive Vice-President John Tenuta. Assisting this effort was a group of contract programmers from Atlantic Data Services, a services firm based in Quincy, Mass.

Tenuta explained that two years ago several of the MSI banks got together and said they wanted to offer a combination of a demand deposit account and a repurchase agreement. Determining through legal experts that this would be possible, they described to MSI what they would require. "We went out and designed how we wanted to interface with our current demand deposit software, and we said we were going to integrate this repurchase agreement logic into our system, but allowing them to establish interest rates to be changed by the bank on a daily basis," he said.

In January 1981, MSI began working with Atlantic Data Services on the project, and by April, the firm was ready to meet the requirements of a Sweep account that the federal government considered releasing at that time. "It would have been another coup right there to be ready to come out when they were offering it," Tenuta said. "But the whole bill fell through and Sweep account never went into effect. So our banks started to offer the Now account, called Accelerate in the area." He explained that this was basically a Now repurchase agreement, the latter referring to a type of uninsured 30-day certificate.

As the concept of Now and Super Now money market accounts began to evolve in

(Continued on Page 40)

Financial System Introduced For IBM 370, Univac Systems

DOWNERS GROVE, Ill. — Circle Software Corp. has introduced a financial planning and modeling system for use with IBM 370 or Sperry Univac computers.

Called C-Fast, the package produces most business reports requiring calculations or numerical tables including financial forecasting, budget vs. actual, variance reports, inventory reports, job costing, price quotes, sales commissions, population projection and market share analysis, the company claimed.

Features include unlimited data base size; three ways to enter data, including collecting information from other data bases; checks for missing data; consolidation; two levels of error messages; and customized report generation. Built-in functions provide rate of return, compounding, net present value, lead and lag and spread and round, the company said.

Instructions are similar to those used in preparation of manual worksheets, a spokesman said. Reports are obtained by using English-like commands to specify data and format required.

C-Fast costs $4,500, including one year's maintenance, from Suite 240, 1100 31st St., Downers Grove, Ill. 60515.

Sun Offers DOS/VSE Service

RADNOR, Pa. — Sun Information Services Co. (SIS) has added an IBM DOS/VSE service to its VM processing line.

The new offering, called VSE/VM, includes all basic facilities of DOS/VSE and other program products including CICS/VS, DOS/VS Cobol, Interactive Computing and Control Facility and VSE/Vsam. IBM program development tools available include CMS, Xedit, Development Management System and Script, according to a spokesman.

Each client company receives its own DOS/VSE system.

VSE/VM is provided at no charge to SIS/VM users. Average monthly usage charges for SIS/VM start at $1,000 with no sign-up fee or minimum usage charge, the spokesman said from 280 King of Prussia Road, Radnor, Pa. 19087.

'Model' 6.0 Bows

NEW YORK — Lloyd Bush and Associates has announced Release 6.0 of its Model financial planning package. The software runs on Honeywell, Inc. DPS 8, Level 66 and 6000 series processors.

The package features capabilities for basic budgeting, an on-line editor, What If analysis and a full math library.

The package costs between $9,000 and $130,000, depending on the modules purchased, the vendor said from 156 William St., New York, N.Y. 10038.

'MIS/OL' Adds DL/1 Interface

OAK BROOK, Ill. — Pansophic Systems, Inc. announced the release of Version 8.0 of MIS/OL, the on-line application development tool designed to operate in an IBM CICS environment.

Version 8.0 will feature an interface to IBM's DL/1 data base management system, large screen support, unlimited number of screens and an unlimited number of fields on a screen, the vendor said. In addition, the product offers new command level interface support, multiple batch load and an increased number of maximum data sets. It also is said to incorporate improved error messages as well as support for IBM 3375 and 3380 disks and Vsam alternate key processing. MIS/OL reportedly provides a security system and input source screens.

MIS/OL is priced at $18,000 for DOS systems and $26,000 for OS systems. Pansophic is located at 709 Enterprise Drive, Oak Brook, Ill. 60521.

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CW 1/24/83

'Sourcemanager,' 'Designmanager' Announced

LEXINGTON, Mass. — An on-line, dictionary-driven Cobol application development system and a data base modeling system for IBM OS and DOS environments have been introduced by Manager Software Products, Inc.

Sourcemanager is said to include a program view dictionary that contains the definition of available programs, a program generator, a reusable source language and a quality assurance facility which can detect and correct violations of standard or style. Programming aids include ability to shorten and expand automatically frequently used keywords, a spokesman said.

Designmanager is based upon a modeling dictionary which allows input and output with user-defined features, the spokesman said. Features include Help screens and definitional query and documentation facilities to support data analysis from the top down and the bottom up. Additional support features include control facilities, memory management with a disk overflow facility and interfaces to popular teleprocessing monitors, the vendor said.

The nucleus price for Designmanager is $13,500 with user-selectable units for interactive front-end processing, user-formatted output and integration to the company's Datamanager data dictionary priced at $4,300. Sourcemanager costs $13,500 with selectable units for reusable source language, an interface to Applied Data Research, Inc.'s Librarian, interface to Pansophic Systems, Inc.'s Panvalet and an integrator to Designmanager priced at $4,300 each. The company is located at 131 Hartwell Ave., Lexington, Mass. 02173.

'DB-Analyze' Updated For Intel System 2000

ELGIN, Ill. — Garman Consultants, Inc. has announced a new release of its DB-Analyze performance monitoring and tuning aid for Intel Corp.'s System 2000 data base management system.

Release 1.1 reportedly adds three new reports for record scattering. One gives a bar graph view of record scattering for each node in the hierarchical and data tables. A second depicts record scattering if the data base were reloaded and the third gives the I/O savings if the data base were reloaded.

Also added are three reports that analyze Intel's Multiple Occurrence Table (MOT) padding for each key in the data base. The first shows current padding, the second predicts padding if the data base were reloaded without changing the current padding specification and the third reveals the padding for each of four specifications if the data were reloaded.

DB-Analyze is available for IBM OS installations. The current license fee is $7,000 from the firm at 143 Brookside Drive, Elgin, Ill. 60120.

Due-Out Factor Added to 'DCMS'

CHERRY HILL, N.J. — A new release of the Data Center Management System (DCMS) has been unveiled by Value Computing, Inc. Major enhancements are said to include the addition of a "due-out factor" to the scheduling component and the ability to validate job control language (JCL), with the JCL validation option operating independently of the system's on-line job submission facility.

DCMS runs on IBM and plug-compatible mainframes, as well as equipment from Burroughs Corp., Sperry Univac and Honeywell, Inc.

The due-out factor reportedly allows users to submit jobs to the current day's schedule even though the job may not be processed until a later day. The newest extension to the JCL validation option enables users to perform syntax checks on jobs that are not part of the production schedule.

Prices for the full DCMS package, consisting of scheduling, on-line data base maintenance and job tracking and automatic job submission, start from $39,000 (IBM VSE version) and $64,000 (MVS). The JCL validation option costs an additional $5,900 from the vendor at 498 N. Kings Highway, Cherry Hill, N.J. 08034.

Point 4 Enhances Iris

IRVINE, Calif. — Point 4 Data Corp. has brought out Version R8 of its Iris operating system for the firm's Mark 3, Mark 5 and Mark 8 computers and compatible machines such as Data General Corp.'s Nova 3 and Nova 4.

Iris R8 introduces Polyfiles, an upward-compatible extension of Point 4's indexed random data files, said to support multiple-volume files of up to 2T bytes. Each file can have up to 16 directories that store keys up to 121 bytes in length. Search statements permit records to be located on a random or sequential basis by matching a search key against keys stored in any of the directories. Polyfiles addresses the limitations on the Iris directory that had become a problem for users with very large files, the vendor said.

Also provided is an improved software security system through the support of coded Pico-N, a new version of the firm's proprietary software protection device. The security system reportedly permits users to control the distribution and use of their proprietary application packages.

Iris R8 was designed to operate on all Point 4 computers that support earlier versions of Iris and Point 4 products such as the Stylus and Typist word processors, the Force application generator and the Lotus cache memory.

Iris R8 costs $5,400 for volume buyers. Point 4 is located at 2569 McCabe Way, Irvine, Calif. 92714.

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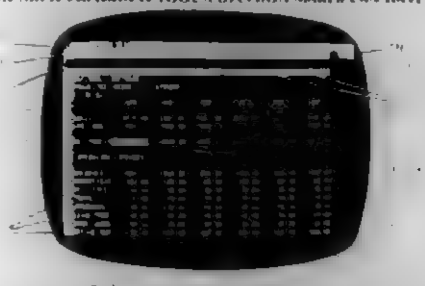

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VCI Adds SMF Link, Dasd To Billing System for 370s

CHERRY HILL, N.J. — Value Computing, Inc. (VCI) has announced Release 8.0 of Comput-A-Charge, its job accounting and billing system for IBM 370 and larger systems, as well as plug-compatible mainframes running under OS/VS. Major enhancements include a redesigned System Management Facility (SMF) interface and the Direct Access Storage Device (Dasd) Space Accounting subsystem, the vendor noted.

Comput-A-Charge's SMF interface reportedly now handles very long-running jobs completely, is automatically restartable and provides diagnostics. Its tailoring language allows end users to define configuration and job characteristics directly to the Comput-A-Charge data base. Tailoring statements can be stored in the data base for automatic execution with each interface update, the vendor said.

The Dasd Space Accounting subsystem is said to gather and report track and volume statistics for resident volumes and handles Vsam as well as non-Vsam files. It also makes available disk usage information that the SMF was not designed to capture, the vendor said.

Comput-A-Charge (OS/VS) costs $14,000, a spokesman said. Optional subsystems for IMS, CICS and CMS are also available from VCI at 498 N. Kings Highway, Cherry Hill, N.J. 08034.

Documentor Fits OS/VS, DOS/VS

ESMOND, R.I. — An Automated Documentor for systems running under IBM OS/VS and DOS/VS has been developed by Paul Newcum Business Applications.

The documentor will reportedly provide documentation directly from source programs and JCL. The user feeds in untouched BAL, Cobol, CICS and DL/1 programs and their JCL.

Jobs, programs, data sets and records are listed in summary fashion for reference to the major elements in the user's system, the vendor claimed. Processing details include the size of the application program, kinds of file organizations used, blocking factors, I/O processing and the source of data sets from previous steps in the same job.

Until April, the software is available at a 35% introductory discount price of $5,525, after which time it will cost $8,500. The firm can be reached through P.O. Box 5185, Esmond, R.I. 02917.

'Soft-Aids' Out For Wang's VS

SEATTLE — Software Extraordinaire, Inc. has released Soft-Aids, a series of software utilities for the Wang Laboratories, Inc. VS line of computers.

Thirteen separate utilities are available including print queue enhancement; a computer-assisted messenger service; hard-copy message capabilities for background tasks; IBM 3270 emulator cluster sharer; batch and on-line file scheduling/transfer with autorecover; enhancement to backup and restore capabilities; tape management system; enhancement to system security administration; disk space management system; autoscheduling/run of batch jobs; advanced menu generator with computer use/time accounting; remote workstation manager and executive secretary functions.

Prices vary from $160 to $3,680, the vendor said from 1419 8th Ave. W., Seattle, Wash. 98119.

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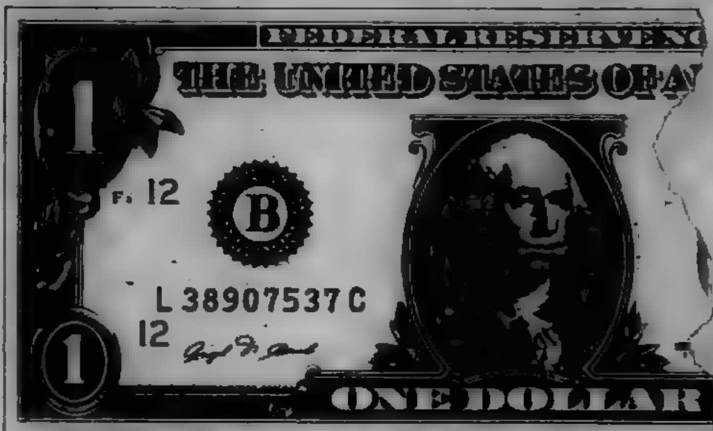

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General Ledger Fits HP 3000

OTTAWA — Quasar Systems Ltd. has developed an on-line general ledger (GL) package for the Hewlett-Packard Co. HP 3000 minicomputer.

The Multiview GL package is said to allow users to view business information from multiple perspectives at any user-defined level of detail without recoding.

Comparisons, multiple consolidations and project, product or line-of-business reporting are said to be possible. A major feature of the package is the Multiview Financial Report Writer, a built-in spreadsheet-type report writer.

The software costs $18,000 from Quasar at 275 Slater St., Ottawa, Canada K1P 5H9.

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DEC, Softool Unveil VAX Facility

MAYNARD, Mass. — Digital Equipment Corp.'s Laboratory Data Products Group here and Softool Corp. of Goleta, Calif., announced the availability of the Softool interactive software development and control facility for VAX systems.

The Softool Programming Environment represents a methodology for software management, development and maintenance. Running under DEC's VMS operating system, the package is said to support a distinction between the host environment, where the software is developed and controlled, and the target environment, where programs are executed.

A Fortran programming environment is currently available, with a Cobol version forthcoming. A permanent license costs $60,000 from both vendors and includes one year of maintenance by Softool.

DEC is based in Maynard, Mass. 01754. Softool is located at 340 S. Kellogg Ave., Goleta, Calif. 93017.

For IDS-II, Pride-ASDM

Honeywell Users Get Link

CINCINNATI — M. Bryce & Associates, Inc. has announced an interface between the Honeywell, Inc. Integrated Data Store (IDS-II) product and its Pride-Automated Systems Design Methodology (Pride-ASDM).

At the heart of the Pride-ASDM software is the Information Resource Manager (IRM), which catalogs and cross-references data, systems and organizational components, according to the vendor.

Based on the specifications residing in the IRM, the IDS-II Interface reportedly generates the schemata and subschemata necessary for the implementation of an IDS-II data base.

Pride-ASDM is currently operational on more than 20 machines, including Honeywell Series 60 L66, Series 6000 and DPS-8 mainframes. Pride-ASDM costs $80,000. The IDS-II Interface costs $7,000 from 1248 Springfield Pike, Cincinnati, Ohio 45215.

Firm Handles Super Nows

(Continued from Page 37)

the banking industry, MSI started talking with Atlantic Data Services about the various changes to software that would be necessary. "Not until the beginning of November 1982 did we actually have the changes defined, and they began programming on them," Tenuta said.

MSI met the dates for the Now account changes by Dec. 15, so its banks were able to begin advertising the new offerings by Dec. 1. Tenuta credited the work on the original Accelerate product for its early start. "Customers were able to put the money into those [Accelerate] accounts and transfer it into the money market accounts as of Dec. 15."

Tenuta described the implementation of the changes for the current Now accounts as a "chess move" for MSI. "Instead of us making only two moves, we had planned that whole thing to evolve into a very flexible rate change system where what we considered multiple groups of accounts could be associated by what we call the plan code." The latter basically defines how an account or a group of accounts will function. MSI and Atlantic Data Services associated groups of accounts with a rate that could be changed daily, if necessary. The Now and Super Now accounts involve weekly or monthly changes in interest rates.

"The changes in April were very extensive," Tenuta said. "The project itself was a major rewrite, an interface to the demand deposit package. We did not set up two separate accounts. We set up a single account and interfaced it to our demand deposit package. The changes that were made in December were additions to those changes made in April."

Tenuta stressed that the changes could not have been made in such a timely fashion without the help of Atlantic Data Services and its familiarity with the MSI system.

MSI has a history of using outside programmers to assist its core staff of 10 programmers with the myriad of software changes they frequently are asked to make. "One of the things we found out is that banking regulations have had a tremendous effect on our ability to meet the dates our customers wanted. If a regulation comes out in January, it has to be in by February," Tenuta continued. "If we try to go in and use our own staff, the time frames themselves don't always allow us to do that. Sometimes it takes a little bit longer to analyze and schedule the people."

For this reason, MSI spends between $100,000 and $200,000 per year on contract programming services. About three years ago, the firm began working with Atlantic Data Services. "Any contract programming group is not a solution to your problem of resources," he cautioned. "It has to be someone who understands the software and your business." Atlantic Data Services provides technicians with banking and financial backgrounds.

FRS/34 Released For System/34

ROCK ISLAND, Ill. — Valley Software, Inc. has announced a financial reporting system (FRS) for the IBM System/34 Manufacturing Accounting and Product Information Control System, Construction Management Accounting System and Distributors Management Accounting System general ledger modules.

Called FRS/34, the system is said to provide financial statements for up to 11 months into the new fiscal year without closing the previous year. It also provides inquiry into general ledger master files for details by period, current budget, current only and history, a spokesman said.

The package maintains four working budgets and three complete years of history and can produce trial balances and financial statements by company or by company and account or groups of accounts.

A one-time license fee costs $1,250 from Valley Software, Inc. at 708 34 Ave., Department B, P.O. Box 909, Rock Island, Ill. 61201.

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User satisfaction? 33% of DMS users said they would *not* recommend their system to others. Among UFO users, 6% would *not* recommend theirs. For MANTIS users, not one single user said no.

Further evidence of MANTIS' superiority is the overwhelming industry acceptance. In only 18 months since its introduction, MANTIS has gained 11% of the total ADS market share. That's a substantially higher growth rate than all of the other seven systems studied.

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These are merely the highlights of the conclusive Merlyn Study. But the findings are clear. When it comes to application development systems, MANTIS is in a class by itself.

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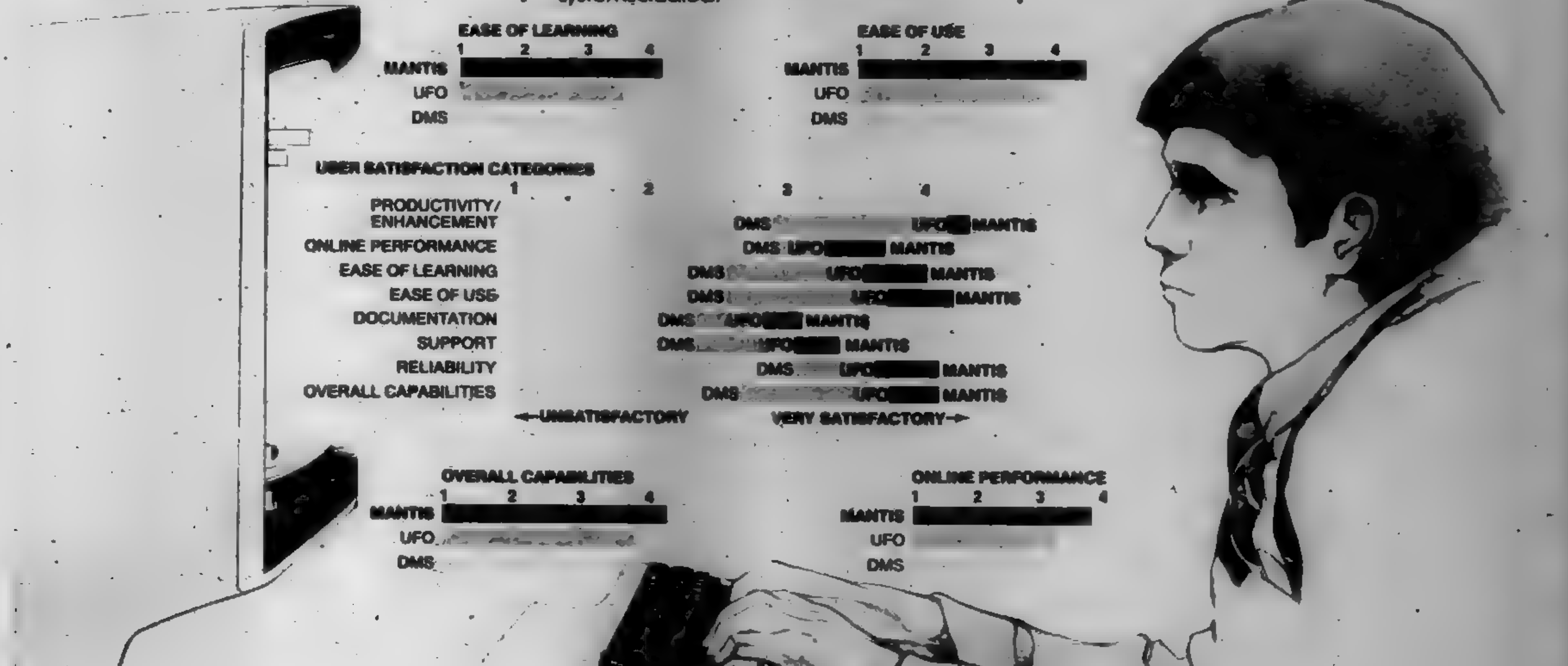

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*"CICS Application Development Systems: The Comparative Consumer Report." Written and published by MERLYN CORPORATION. Survey data from Focus Research Systems, Inc. 1982.

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Data Service Converts IBM System/34 to /38

DURHAM, N.C. — Sysgen, Inc. has announced a service to convert IBM System/34 data and programs to run on a System/38.

The company accomplishes the conversion through direct code conversion, external definition of files for use in a data base environment, rewrite of interactive programs and redesign of application programs.

A firm with a well-structured program package and documentation can anticipate a cost of 15 cent/line to 20 cent/line of code. Redesign and writing of RPG programs may cost from $1/line to $1.50/line. Sysgen is located at Suite 110, 3001 Academy Drive, Durham, N.C. 27707.

Utilities Released for Wang's VS

RALEIGH, N.C. — Southern Data Systems, Inc. has released three utilities for the Wang Laboratories, Inc. VS line of computers.

Ezscreen creates and modifies user-defined screens. The package works in conjunction with Wang's Ezformat utility and allows users to make screen changes without redefining the screen. The product remembers all field names and their positions and prompts the user for only the modified field names.

Ezscreen allows full 32-char. field names. Default library and volume names can be specified for automatic saving of Ezscreen-generated files. The utility costs $249.

Backlib and Backfile operate as system utilities and require two steps to back up the desired libraries or files. They allow the user to "check off" the material to be backed up from a display of all the libraries or files on the specified source volume. The utilities then perform complete backup of all selected libraries or files to the specified volume.

Backfile and Backlib are available together for $99, the vendor said from 5109 Holly Ridge Road, Raleigh, N.C. 27612.

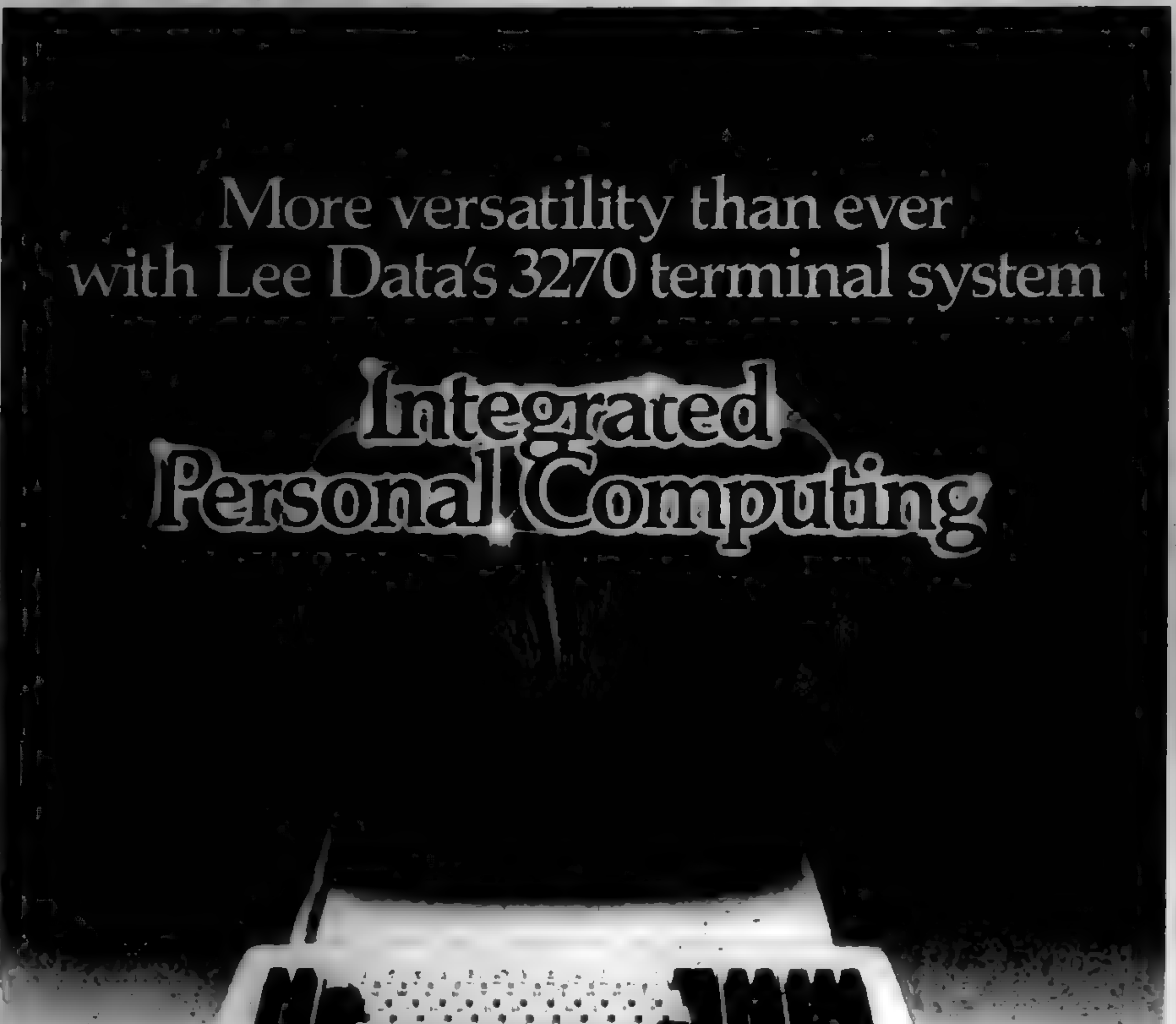
System/38 Gets Package

INDIANAPOLIS — Packagedeal, Inc. has announced an accounts payable and general ledger package for IBM's System/38.

The accounts payable segment of the package feature multilevel company accounting and inquiry features.

The general ledger package includes multilevel accounting and a full-function report writer.

The package costs $2,450, the vendor said from 4810 Graceland Ave., Indianapolis, Ind. 46208.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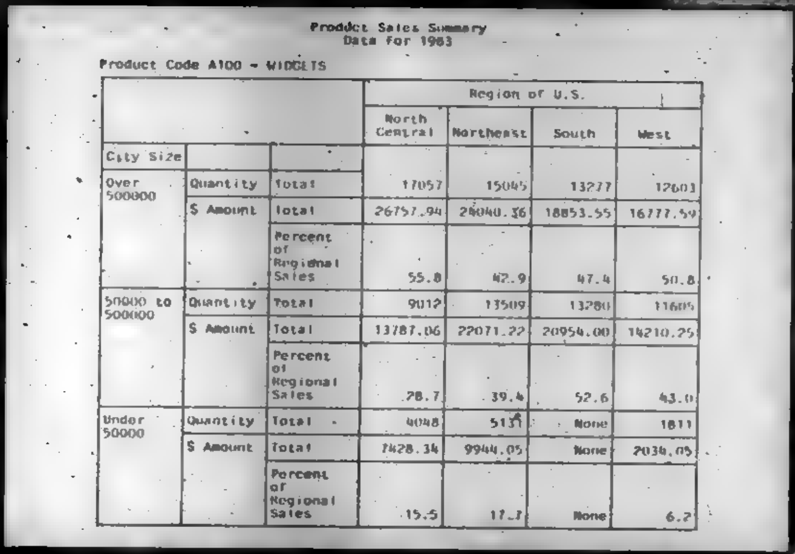

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Data for 1983

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			Region of U.S.			
			North Central	Northeast	South	West
City Size						
Over 500000	Quantity	Total	17057	15045	13277	12603
	$ Amount	Total	26757.94	28040.36	18853.55	16777.59
		Percent of Regional Sales	55.8	42.9	47.4	50.8
50000 to 500000	Quantity	Total	9012	13509	13280	11605
	$ Amount	Total	13787.06	22071.22	20954.00	14210.25
		Percent of Regional Sales	28.7	39.4	52.6	43.0
Under 50000	Quantity	Total	4048	5131	None	1811
	$ Amount	Total	7428.34	9944.05	None	2034.05
		Percent of Regional Sales	15.5	17.7	None	6.2

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SAS Institute (NZ) Limited, PO Box 10-109, The Terrace, Wellington, New Zealand. Phone (4) 727-595. Telex NZ 31626.

SAS Software Pty. Ltd., Level 60, MLC Centre, 19-29 Martin Place, GPO Box 4345, Sydney, NSW 2001, Australia. Phone (02) 235-2199. Telex AA 71499.

IEEE Approves Test Documentation Standard

NEW YORK — A software test documentation standard has been approved by the Institute of Electrical and Electronics Engineers (IEEE) for submission to the American National Standards Institute. The standard reportedly describes a set of basic test documents and specifies the form and content of each document in the set. The set includes test plans, test design specifications, test case specifications, test procedure specifications, test item transmittal reports, test logs, test incident reports and test summary reports. A complete example of each document is included in an appendix. The documents are intended to be used at all levels, from module testing through user acceptance.

The standard will be available in the first quarter of 1983 from the IEEE Standards Board, 345 E. 47th St., New York, N.Y. 10017. IEEE also announced that a working group is being formed to examine the feasibility of standardizing one level of the process itself. The group will focus on unit testing and attempt to determine if consensus can be reached on a standard for the various tasks involved in testing a computer program.

IEEE membership is not required for membership in the working group. The first meeting will take place Feb. 16-18 at the National Bureau of Standards in Washington, D.C. The second meeting is scheduled for May 23-25 in San Francisco. Further details can be obtained from David Gelperin, Software Quality Engineering, 2425 Zealand Ave. N., Golden Valley, Minn. 55427.

I.P. Sharp Adds Disclosure II to Library

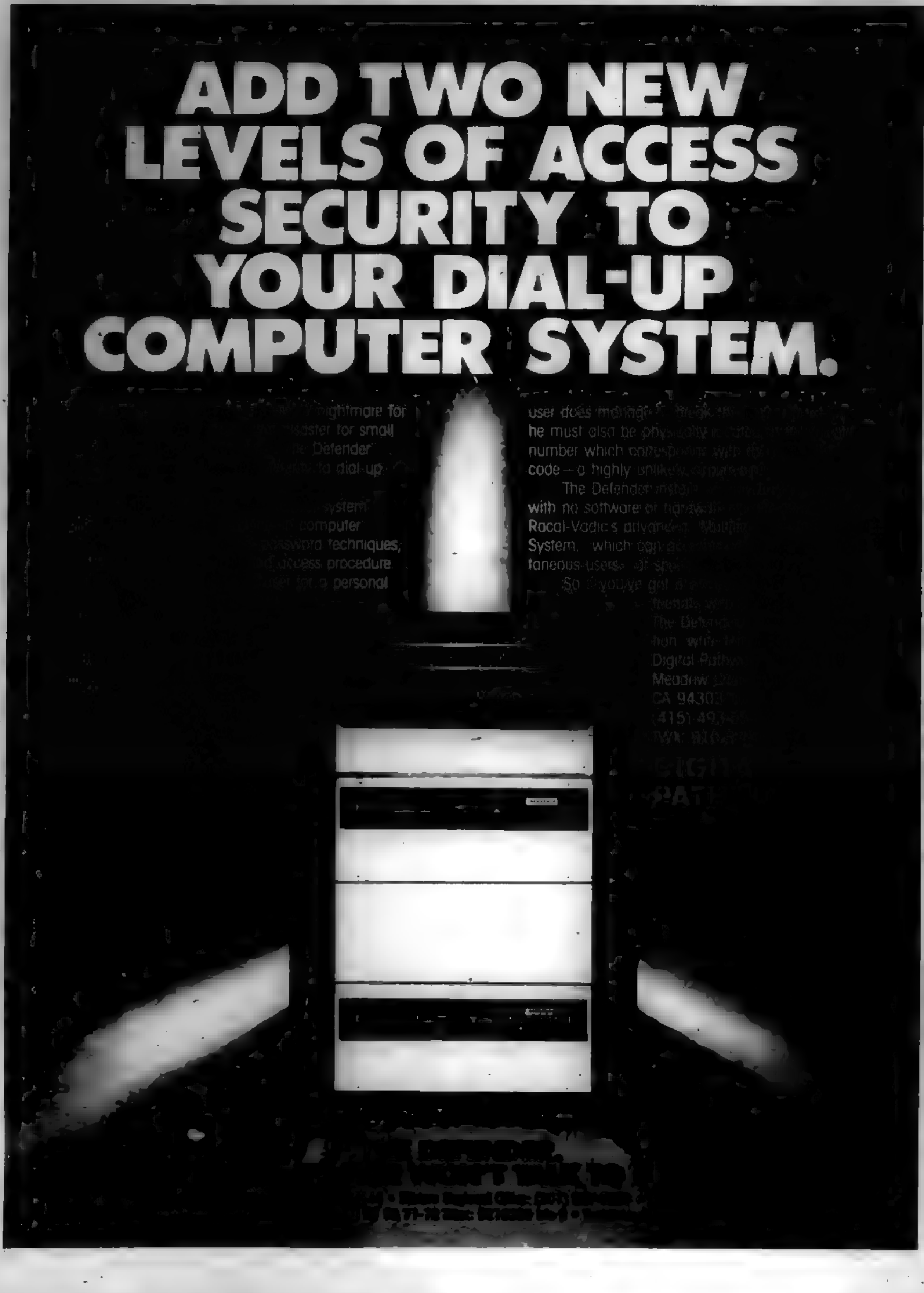
TORONTO — I.P. Sharp Associates has enhanced its financial data base library with the addition of Disclosure II.

The Disclosure II data base includes current and historical corporate statistics and textual information for over 8,500 publicly owned companies that have files with the U.S. Securities and Exchange Commission. The data for each company in the Disclosure II data base is composed of two types of information — numeric and textual.

The numeric portion contains two years of annual balance sheet items and three years of annual income statement items as well as quarterly income statements for the current filing year. The textual portion includes company name and address, details on officers and directors, segment data, auditor's names, subsidiaries, exhibits and corporate events, the vendor said.

There is no up-front subscription fee for the use of the Disclosure II data base. Users are charged a small surcharge only for the items of information actually retrieved. Timesharing rates of $1/hour connect time, 25 cents to 45 cents per/CPD used and 70 cents per thousand characters are paid to I.P. Sharp Associates, with no minimum monthly fee.

I.P Sharp is located at Suite 1900, 2 First Canadian Place, Toronto, Ontario, M5X 1E3.



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SEL Users Get Debugging Aid

GOLDEN, Colo. — Interactive Solutions, Inc. has announced a debugging and instrumentation package for users of the Gould SEL computer system.

Called AID, the package reportedly includes a subroutine call stock, which lets the user know the currently executing routine and complete calling sequence. The package also includes automatic program instrumentation, recording of instruction history and monitoring of program variables without modification of source code, the vendor said.

The package costs $8,400 from Interactive Solutions through Box 10648, Edgemont, Golden, Colo. 80401.

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Mega System's DDS Gets Graphics Module

EAST LANSING, Mich. — The Prime Computer, Inc. minicomputer version of Mega Systems, Inc.'s Decision Support System (DSS) now includes a printer graphics module.

The module provides graphics representation of data without requiring additional specialized hardware. It offers 14 different varieties of bar, line and pie charts.

An overlay option allows the combination of bar and line graphs within a single graph presentation.

Mega DSS Graphics is available as an addition to Mega DSS for $1,000/package licensed to Prime users.

Mega can be reached through P.O. Box 151, East Lansing, Mich. 48823.

Budget Time-Share Offers VIP Service to Its Users

MARINA DEL REY, Calif. — Budget Time-Share, Inc. is strengthening its emphasis on service and support with interactive service programs designed to meet the general and specific needs of the user.

The service will feature user questionnaires; electronic suggestion box with return mail response; on-line documentation; charge code accounting; and electronic conference calls.

There is no additional charge to users. The vendor has no initial start-up fee and charges $8/hour for connect-time, a spokesman said from 4739 Alla Road, Marina Del Rey, Calif. 90291.

On-Line System Out for Farmers

MILWAUKEE — Agridata Resources, Inc. (ARI) recently announced the operation of its on-line interactive Agristar information system for "one of the last untapped areas for computing" — the agricultural community.

Agristar was developed to meet this growing market and reportedly can be used with any Ascii-based communicating microcomputer or data terminal to give farmers, ranchers and other agricultural businesses instant access to financial, business, marketing, weather and news information.

Users reportedly are able to access this information from ARI's central data base in Milwaukee via telephone lines connected to the company's Honeywell, Inc. mainframe.

ARI receives its information from various data-gathering organizations, including agriculture industry publishers, meteorological services, commodity brokerage houses and selected corporations, associations and colleges, according to the company.

Agristar also offers users an electronic mail function called Stargram; a time-sharing farm management analysis and forecasting program; an agricultural encyclopedia; and a library of agricultural production technology. A product and service electronic "yellow pages" is planned for system integration later this year.

Agristar will be distributed through Radio Shack retail stores by an exclusive agreement with Tandy Corp., ARI said. The cost to an average farmer, excluding hardware, is reportedly about $100/mo on a daily use basis. ARI is located at 205 W. Highland Ave., Milwaukee, Wis. 53203.

System/38 Users Get RPG/3-Rule

HUNT, Texas — A programming/debugging ruler for users of RPG/3 or data description specifications (DDS) on the IBM System/38 is available from Hexco, Inc.

The stainless steel RPG/3-Rule has scales for underlaying all eight specifications.

The ruler costs $24, with personalization available for an additional $6, from the vendor through P.O. Box 199-RO, Hunt, Texas 78024.

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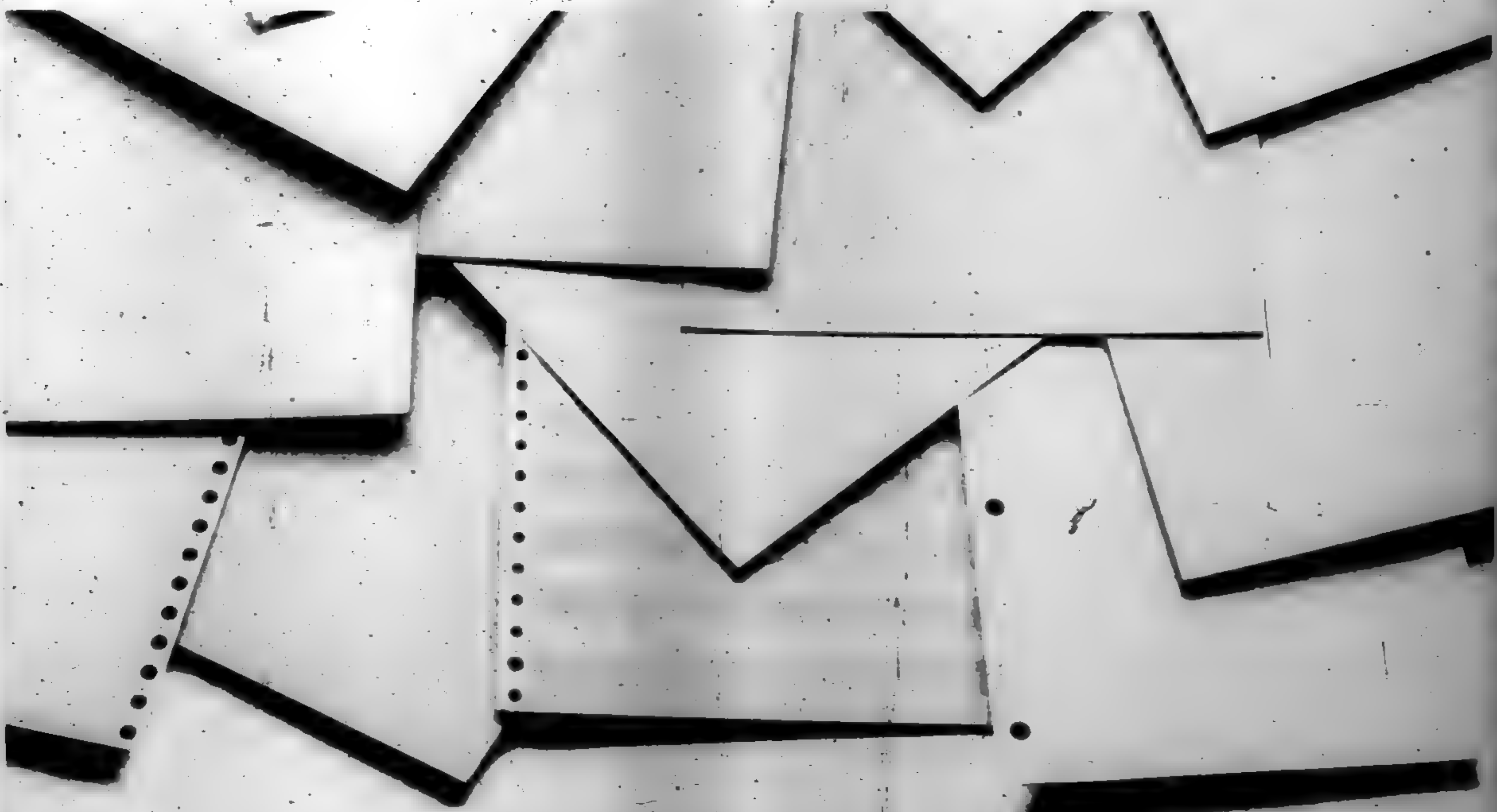

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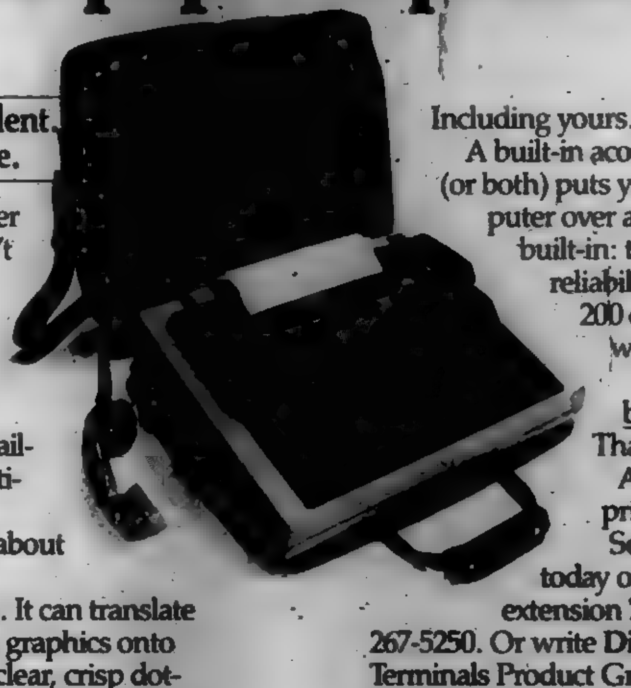

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For Financial Specialists

ARA Data Base Announced

CLEVELAND — Predicasts, Inc. has announced an Annual Reports Abstracts (ARA) data base with applications for marketing, planning and financial specialists.

Available in February through Dialog Information Services, Inc.'s and in April through Bibliographic Retrieval Service, Inc.'s BRS, ARA is said to be accessible through "most terminals," the vendor said.

ARA reportedly will provide abstracts of information in the annual reports of thousands of U.S. and international companies.

ARA will initially contain 27,000 abstracts covering 3,000 companies. Pricing will be based on hourly usage plus a per-record charge, a spokesman for the vendor said.

The data base is available from 11001 Cedar Ave., Cleveland, Ohio 44106.

Realty Aid Fits Wang VS

RIVER EDGE, N.J. — Cliff Data Systems, Inc. has unveiled a commercial/industrial retail real estate package written in Wang Laboratories, Inc.'s Cobol for the Wang VS line.

Leasetrak-II is said to be fully integrated; to tie together accounting, leasing and operational management departments off the same data base; and to interface with accounts payable, payroll and general ledger packages.

A single-CPU license costs $10,000, and a multiple-CPU license costs $15,000 for the first two CPU installations with a subsequent use royalty fee of $5,000/CPU installation. Prices include user manual and Cobol source code. The package is available from the vendor at 111 Kinderkamack Road, River Edge, N.J. 07661.

Designer Layout Package Out

HOUSTON — A heating, ventilation and air conditioning duct layout automated drafting package said to increase designer productivity is available from Engineering Graphics Technology.

To use Ductsys, the designer selects a duct fitting symbol from the Ductsys menu and places it at the desired location on the drawing displayed on the computer-aided design (CAD) terminal.

Ductsys reportedly will automatically draw the fitting and the connecting duct from previous fittings. Selection of fittings includes transitions, tees, splits and curved bends for any user-specified angles.

Usable on CAD systems from Intergraph Corp., the package costs $2,500 from Engineering Graphics Technology at Suite D106, 11231 Richmond, Houston, Texas 77082.

Plato Offered For DEC CPUs

NEW YORK — Operations Research/Management Science Dialogue, Inc. has announced that it is offering a version of its Plato decision support system for Digital Equipment Corp. VAX and Decsystem-20 series processors.

Plato, an integrated language that incorporates analytical routines, three data management packages, a report generator and graphics package, already is available on Prime Computer Corp. and IBM VM/CMS processors, the vendor explained. The language is written in Fortran and can be transferred to other processors, according to a spokesman for the vendor.

The DEC-compatible version of Plato is priced from $30,000, the vendor said from 35th Floor, 19 Rector St., New York, N.Y. 10006.

'NDS' Allows On-Site Updates

NORCROSS, Ga. — Digital Communications Associates, Inc. has introduced a software package that is said to allow users of the company's System 355 Master Network Processor to create or update network configurations on-site.

The Network Design System (NDS) Processor is implemented as three-code modules that can run as part of the customer's on-line System 355.

The NDS is available for $4,995, which includes training for up to two people and documentation. More information is available from Digital Communications Associates, Inc., 303 Technology Park, Norcross, Ga. 30030.

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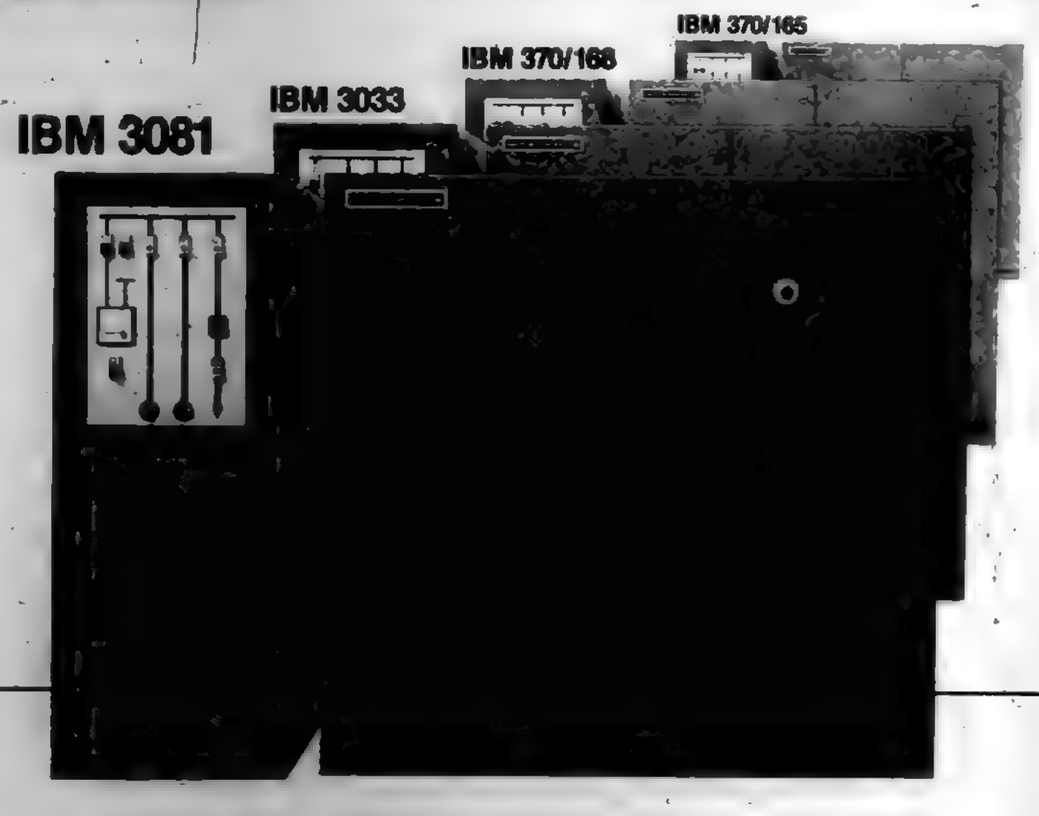

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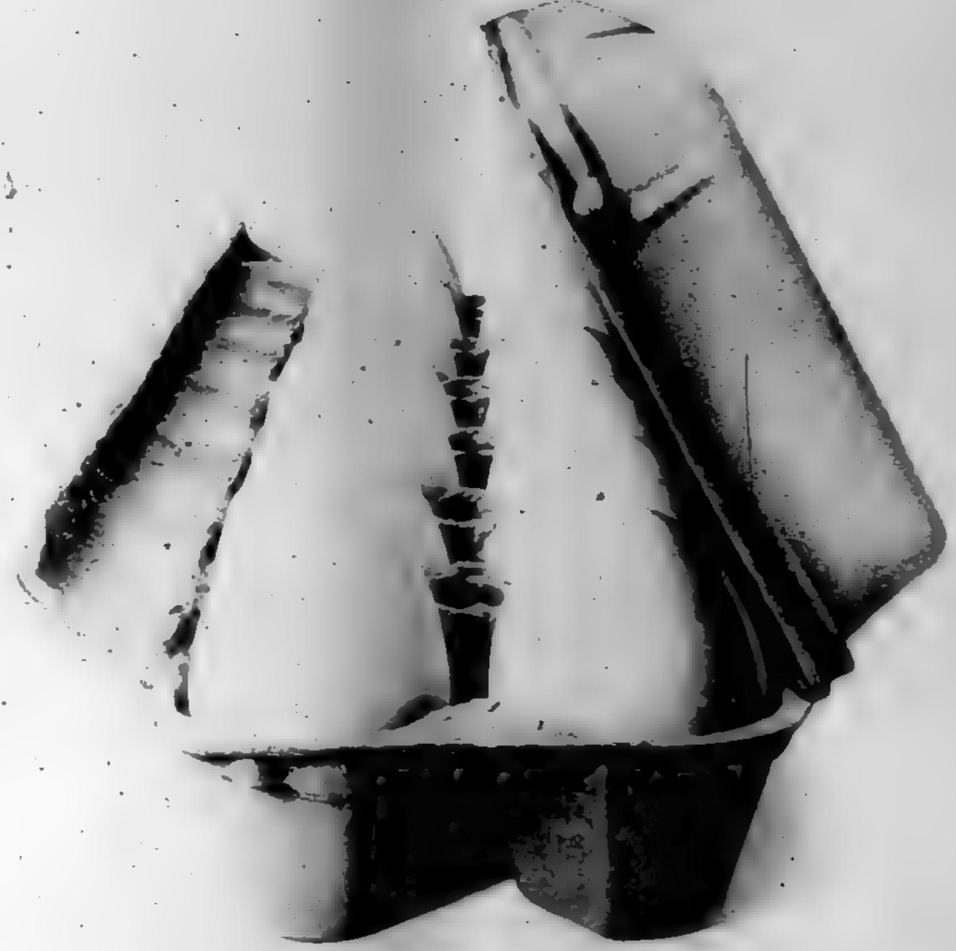

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Micro Notes

Information Unlimited Software, Inc. announced a package offering a programmable spreadsheet capacity for IBM Personal Computer users. Called **Easy Planner**, the system reportedly allows the user to specify the steps he needs to take in performing worksheet calculations, in addition to performing other standard spreadsheet functions. The product is available for $250, according to the vendor at 2401 Marinship Way, Sausalito, Calif. 94965.

Bytek, Inc. has announced a menu processor for microcomputers that support RM/Cobol.

Called **Menu Master**, the menu processor is said to provide multilevel menus with built-in security. Menus require no compilation, a spokesman said. Other features include interactive menu editing, ability to create a general network in which other menus and user-written processes can be called from a menu item, ability to traverse the menu network in any direction and automatic generation of documentation on the menu networks. Menu Master is priced at $245.

At the same time, the company announced that Computhink, Inc. will distribute Bytek's Cogen RM/Cobol generator on Computhink's family of Motorola, Inc. 68000-based Hawk microcomputers.

Bytek is located at 1714 Solano Ave., Berkeley, Calif. 94707.

A Forth language compiler for the IBM Personal Computer has been introduced here by Armadillo International Software. **PCForth** is based on the Fig model of Forth and comes with a 75-page manual and diskette. It costs $59.95 and the vendor can be reached through P.O. Box 7661, Austin, Texas 78712.

Science Research Associates, Inc. has announced a new software package that introduces the user to Basic. **Discovering Basic** reportedly teaches fundamental programming concepts via a series of exercises and comes with a diskette, a workbook and an instructor's guide. It runs on Apple Computer, Inc.'s Apple II microcomputers and costs $210, the vendor said from 155 N. Wacker Drive, Chicago, Ill. 60606.

Money Decisions Volume II for the IBM Personal Computer has been announced by Eagle Software Publishing, Inc. This product is a collection of 36 business and financial problem-solving routines, with integrated graphics support enabling the user to perform business calculations and financial analysis with ease, according to the vendor. It costs $229, the vendor said from 110 W. Lancaster Ave., Wayne, Pa. 19087.

An operating system called **CP/M Plus** for business and commercial applications has been developed by Digital Research, Inc. This system is reportedly fully compatible with all other 8-bit Digital Research operating systems. It is designed to enhance performance of 8-bit microcomputers with one or more banks of 64K bytes of random access memory. This system also features error trapping and recovery, the vendor said. Prices start at $350. The vendor can be reach through P.O. Box 579, 160 Central Ave., Pacific Grove, Calif. 93950.

Superfile reportedly solves text data organization problems by letting users of IBM Personal Computers cross-reference and retrieve information with up to 250 personal keywords. This product was formerly only available to Digital Research, Inc. CP/M- and MP/M-based systems with Zilog, Inc. Z-80 central processing units. It costs $195 from FYI, Inc. through P.O. Box 10998, No. 615, Austin, Texas 78766.

A software development tool consisting of a **Host Operating System** and the **Snapple Hand Held Computer** simulator for Apple Computer, Inc. Apple II and Apple II Plus users has been unveiled here by Panasonic Co. In addition to facilitiating software development, this product reportedly allows debugging and testing of Apple II systems. This product costs $1580 through Panasonic at One Panasonic Way, Secaucus, N.J. 07094.

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TI Reduces Prices On Silent 700 Terminal Line

DALLAS — Texas Instruments, Inc. has announced price reductions of 10% to 24% on selected models of its Silent 700 data terminal product line.

The reductions affect the list prices of the 30 char./sec Models 743 Receive Only, 743 Keyboard Send-Receive (KSR) and 745 Portable Data Terminal. The price reductions affect unshipped backlog, new orders and existing purchase agreements, a company spokesman said.

The price changes are as follows: 743 Receive Only, from $995 to $895 (10%); 743 KSR, from $1,195 to $995 (17%); 743 KSR with compressed print option, from $1,490 to $1,250 (16%); 745 Portable Data Terminal, from $1,695 to $1,295 (24%); and 745 Portable Data Terminal with compressed print option, from $1,990 to $1,550 (22%).

TI also announced a 14% price reduction on its 136-col. compressed print option for the Models 743 and 745 when factory installed and 18% when field installed. The field-installed price for the option is now $350, down from $425. The factory-installed price is $255.

Further information is available from TI's Data Systems Group, P.O. Box 402430, H-637, Dallas, Texas 75234.

Choosing Local-Area Net Focus of Users' Seminar

By Phil Hirsch

CW Washington Bureau

ORLANDO, Fla. — The factors that users should consider when choosing a local-area network were discussed at length during a four-day seminar here last week on "Local-Area Networking and Beyond," sponsored by the International Communications Association, a user group made up of most of the nation's largest companies.

According to one conference speaker, consultant Harvey Freeman, the local-area network evaluation process should begin with the application, which must be examined in terms of several variables.

For example, Freeman said, the user must decide how important it is to prevent the application from being interrupted by a network failure. Ring-type local-area networks are less vulnerable to total breakdown than bus- or private automatic branch exchange-based systems, he noted, although some suppliers of the latter architectures have found ways to minimize this problem.

Private branch exchange-based nets can employ multiple, distributed switch modules, and at least one vendor of broadband-type local-area networks — Amdax Corp. — guards against failure of the head end by providing a standby head end.

Traffic mix is another selection factor, Freeman said. Because they provide multiple channels, broadband local-area networks can carry voice, video and data concurrently: baseband systems are restricted to data.

However, baseband systems are cheaper, according to Charlie Bass, vice-president and co-founder of Ungerman-Bass, Inc. A 1M byte/sec baseband transceiver costs approximately $100 vs. about $500 for a 1M byte/sec broadband modem, he said.

Moreover, the baseband system can transmit up to 50M bit/sec vs. a maximum channel rate of 10M bit/sec for broadband, added Bass, who also spoke at the conference.

But such figures can be misleading, Freeman said, because they represent only the node-to-node transmission speed. Because of delays between those points and the terminal — delays caused by the need to process incoming bits before they can be delivered to the receiving terminal and outgoing bits before they can be transmitted — the end-to-end throughput on a local-area network, regardless of type, is generally only about 10% of the node-to-node speed and is dependent for the most part on other factors, Freeman said.

There are several ways to maximize throughput on a local-area network, but the cost-effectiveness of these methods is controlled largely by the traffic pattern, both speakers pointed out.

One way is to use Carrier Sense Multiple Access/Collision Detection to allocate access to the channel. Simpler, cheaper schemes may be adequate if there is not much chance that one terminal will try to transmit at the same time as another.

According to the speakers, additional variables to consider include:

(Continued on Page 52)

For Micro-to-CPU Link

Release 2 of 'Context MBA' Out

TORRANCE, Calif. — Context Management Systems has introduced Release 2 of the Context MBA software package for micro to mainframe communications. The current version of the package contains a telecommunications and conversion feature.

The package allows communication between an IBM Personal Computer and any other host, including mainframes, a vendor spokesman claimed. Models, reports and other data produced on the MBA can be sent electronically to a central computer in a mail system or to another MBA-equipped personal computer.

Context MBA is said to integrate modeling, graphics, word processing, data base, forms and telecommunications in one program. A version without telecommunications capabilities is available for the Hewlett-Packard Co. 9816 microcomputer-based desktop.

The price for the IBM version of the release is $695; the HP version costs $795. More information is available from Context Management Systems, Suite 101, 23864 Hawthorne Blvd., Torrance Calif. 90505.

Aztek's 'SIM3278' Links Micros to IBM Mainframes

OTTAWA — Aztek Computing, Inc. has introduced a software package said to link microcomputers and asynchronous terminals to IBM mainframe computers and have them appear as local IBM 3278 terminals.

Named SIM3278, the protocol conversion software provides the full-screen functions of a 3278 while using an Ascii terminal without any hardware or operating-system modifications or additions..

Existing full-screen software can be used without modification by both microcomputer and dumb terminals. The package translates 3270 data streams into Ascii control sequences valid for the specific type of CRT terminal and vice versa.

The package is available for a one-time purchase fee of $5,000 from Aztek Computing, 969 Bronson Ave., Ottawa, Ontario, Canada K1S 4G8.

System Access Security Offered

PALO ALTO, Calif. — Digital Pathways introduced a computer access security system that reportedly allows traditional computer logon procedures and functions as an authorization point through which users must receive clearance prior to accessing the computer.

Defender provides a solution to the problem of access security over dial-up data lines. The user calls the system on any standard Touch-Tone telephone.

A digitized voice response asks the user to enter an identification code number using the telephone's numeric key pad, according to a vendor spokesman.

After receiving the identification number, Defender reportedly checks its validity and instructs the caller either to hang up or to reenter the identification number. If after three attempts or 30 seconds the identification number has not been successfully entered, Defender automatically disconnects and sends an alarm message to its printer, according to a vendor spokesman.

Following a successful identification transaction, Defender tells the user to hang up and then determines the user's speed class and priority and retrieves from its memory the user's authorized telephone number. Once this has been done, its automatic dialer calls the user back at the authorized number and then transfers control of the phone line over to its central modem.

Configured for 14 outgoing lines, Defender is priced at $14,975. Further information is available from Digital Pathways at 1060 E. Meadow Circle, Palo Alto, Calif. 94303.

CRC Modem Works Via House Wiring

SEATTLE — Communications Research Corp. (CRC) has introduced a 100-line carrier modem said to utilize existing house, factory or office power wiring to connect terminals and printers to a computer.

The LCM-100 transmits at 9,600 bit/sec and consists of two units. One unit works with the computers, while the other handles printers and other devices, according to the vendor.

The LCM-100 is available for $365/set from the firm at 1720 130th Ave. N.E., Bellevue, Wash. 98005.

Efficient Local-Area Nets to Grow: Consultant

ORLANDO, Fla. — The use of local-area networks will increase significantly during the '80s because they represent the most efficient way of interconnecting a growing population of data terminals, a speaker at last week's International Communications Association conference maintained.

According to consultant Harvey Freeman, the growth of local-area networks is being spurred by a growing awareness of the data terminal's cost-avoidance potential. The salaries and fringe benefits paid to middle-level executives represent a major part of office costs; data terminals usually enable them to do significantly more work in less time, he noted.

Also spurring the use of local-area networks is rising communication costs, Freeman said, observing that local-area networks often save money compared with carrier-provided services. He expects rates for local-exchange services to increase dramatically after AT&T divests the Bell operating companies, making local-area networks even more attractive.

Freeman predicted that:

- Future local-area networks will employ hierarchical architectures, enabling ring-, bus- and star-type private automatic branch exchange networks to be interconnected.
- Local-area network costs — which have been coming down — will decrease further because of very large-scale integration technology.
- The popularity of fiber-optic cable-based local-area networks, which now represent a minority of the installations, will rise dramatically within the next few years, fueled by decreasing prices and improved installation techniques. By 1989, most local-area networks will be using fiber-optic transmission media, Freeman forecast.

PBX Costing Called 'Different'

ORLANDO, Fla. — Determining the cost of a private branch exchange-based (PBX) local-area network involves factors "quite different" from those associated with dedicated data networks, according to William LaFlamme, a speaker at last week's International Communications Association conference here.

"The basic cost of the PBX will be justified by the telephone requirements of the organization," explained LaFlamme, director of product marketing for Lexar Corp., a maker of voice/data PBX equipment. "Potential savings in [this] area alone may well pay for the switch."

Designing a system that is considerably larger than the one that is required for current needs is "a normal procedure," LaFlamme said. In addition, adding data communications capability to a PBX network requires a data interface at the switch port and may call for upgrading the switch central equipment. However, the PBX-based system "has inherent in its architecture the ability to reduce some of the long-distance charges created by off-site communications," he noted.

"The ability to allocate or rebill communications costs can also result in substantial savings in many cases," he said.

Local Net Discussed

(Continued from Page 51)

- The maximum number of terminals that have to be served at any station on the network. Some local-area networks require a minimum distance between connection points ("taps"), which could limit the number of devices that can be attached within a single office.
- Terminal protocols. Since each local-area network vendor does not support all terminal protocols, the user must determine which ones he will need during the life of his network.
- Interfaces to other networks. The user has to determine the external networks with which he will need to interface since no local-area network vendor currently provides universal interconnection.

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Fiber-Optic Links Created For Pronet Net Systems

WALTHAM, Mass. — Fiber-optic links, usable in place of wire on any Pronet network system, are available from Proteon Associates.

The links are available in lengths up to 2.5 km as standard catalog items and up to 10 km (node-to-node distance) for special units. Advantages include no degradation of either network performance or reliability due to the linkage and security provided by fiber-optic links, which are very difficult to tap. Proteon fiber-optic links are suitable for connecting distant clusters of machines, serving as links between Pronet wire centers, according to a vendor spokesman.

Priced between $1,350 and $1,600 depending on the size and number of units purchased, the links are available from Proteon Associates at 24 Crescent St., Waltham, Mass. 02154.

Sprinter Unit Allows Editing Before Printing

CARROLLTON, Texas — Computer Language Research, Inc. has introduced a previewing terminal designed for use with the company's Sprinter software, a text and form composition system for the production of insurance policies, technical manuals, documentation, proposals and directories.

The Sprinter Previewing Terminal, combined with the Xerox Corp. 9700/8700 Electronic Printing System and the software, offers an alternative to traditional typesetting, a vendor spokesman said.

The terminal is designed for proofing copy before printing and the CRT screen displays a duplication of the output. This allows composition and editing of documents before the printer is used.

The terminal is available for $12,000 from Computer Language Research, Inc., 2395 Midway Road, Carrollton, Texas 75006.

Phalo Enhances Fiber-Optic Line

CHATSWORTH, Calif. — Phalo/O.S.D. Corp. has announced an addition to its fiber-optic line of products, a high-speed asynchronous/synchronous time division multiplexer. It was designed for computer-to-terminal link, secured communications link and links between process control equipment.

The OMX-5600 provides eight full-duplex channels, will support data rates up to 57.6K bit/sec on each input channel and features remote and local loopback testing paths for data on a channel-by-channel basis. It is available in a stand-alone/rack-mountable configuration.

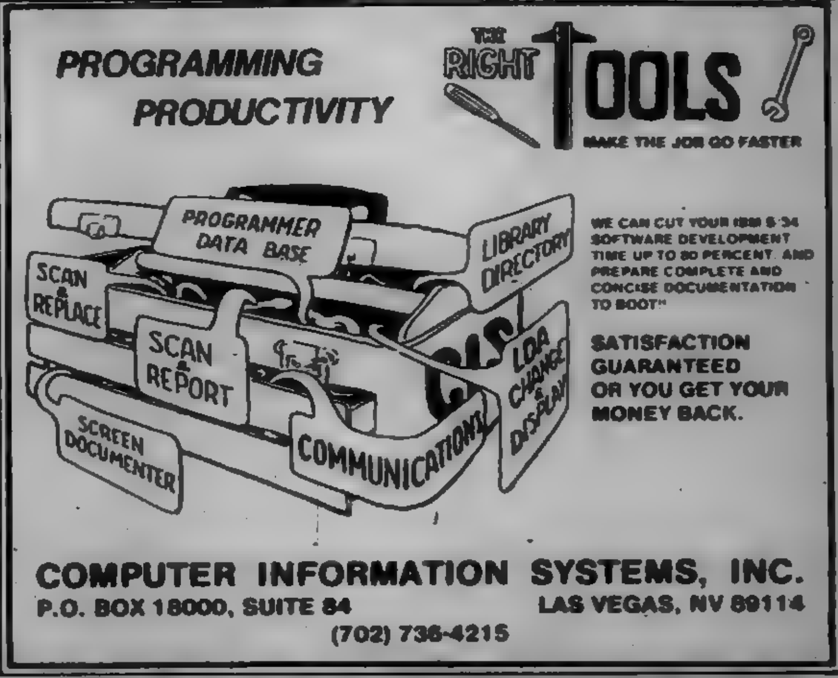
The base price for eight channels is $6,000. More information is available from Phalo/O.S.D., 9240 Deering Ave., Chatsworth, Calif. 91311.

Brochure Describes Selection of Cables

LINCOLN, R.I. — International Data Sciences, Inc. is offering a six-page brochure describing a selection of data communications cables.

The brochure includes standard and long-distance EIA RS-232C cable, Null Modem cable, EIA RS-449 cable, V.35 cable, 25-Wire ribbon cable and four types of coaxial cable. Cable descriptions and detailed electrical specifications are included.

The "1982 Data Interface Cable" brochure is available at no cost from the vendor at 7 Wellington Road, Lincoln, R.I. 02865.



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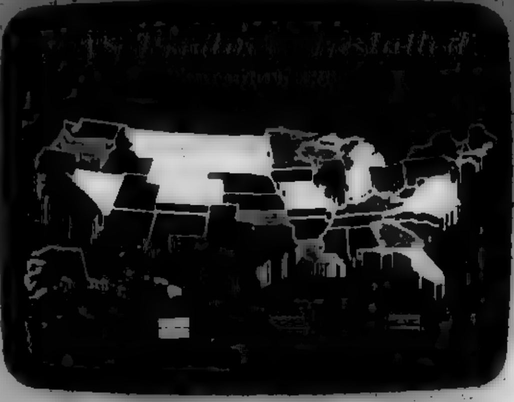

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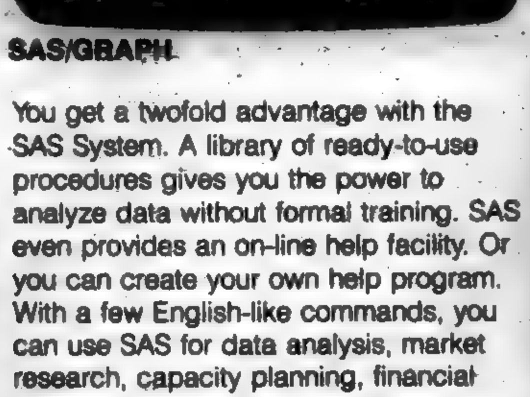

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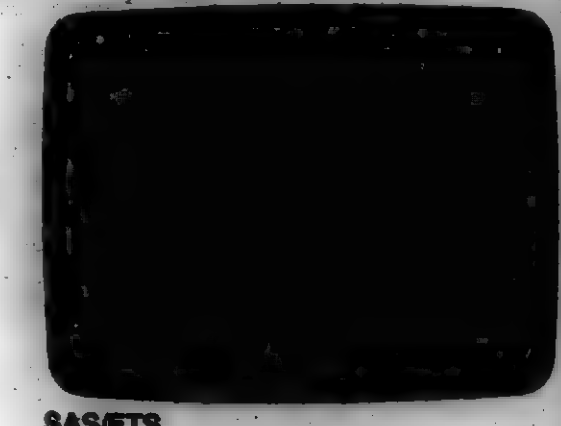

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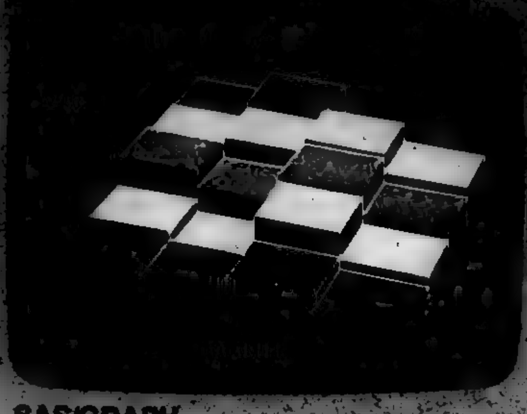

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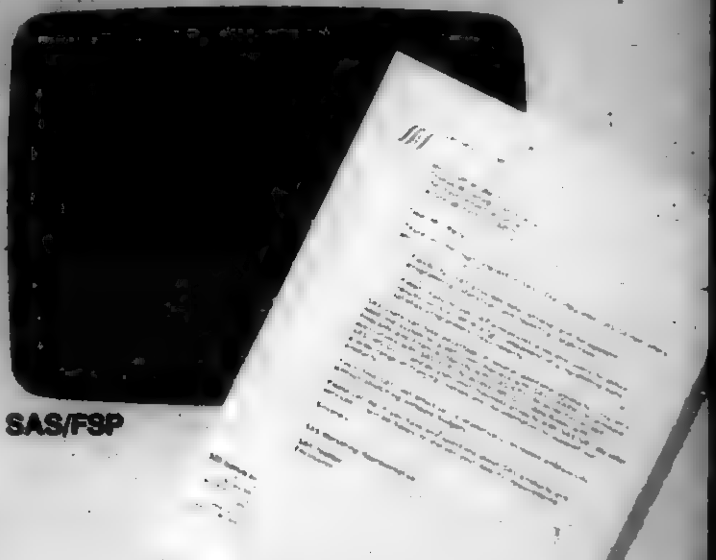

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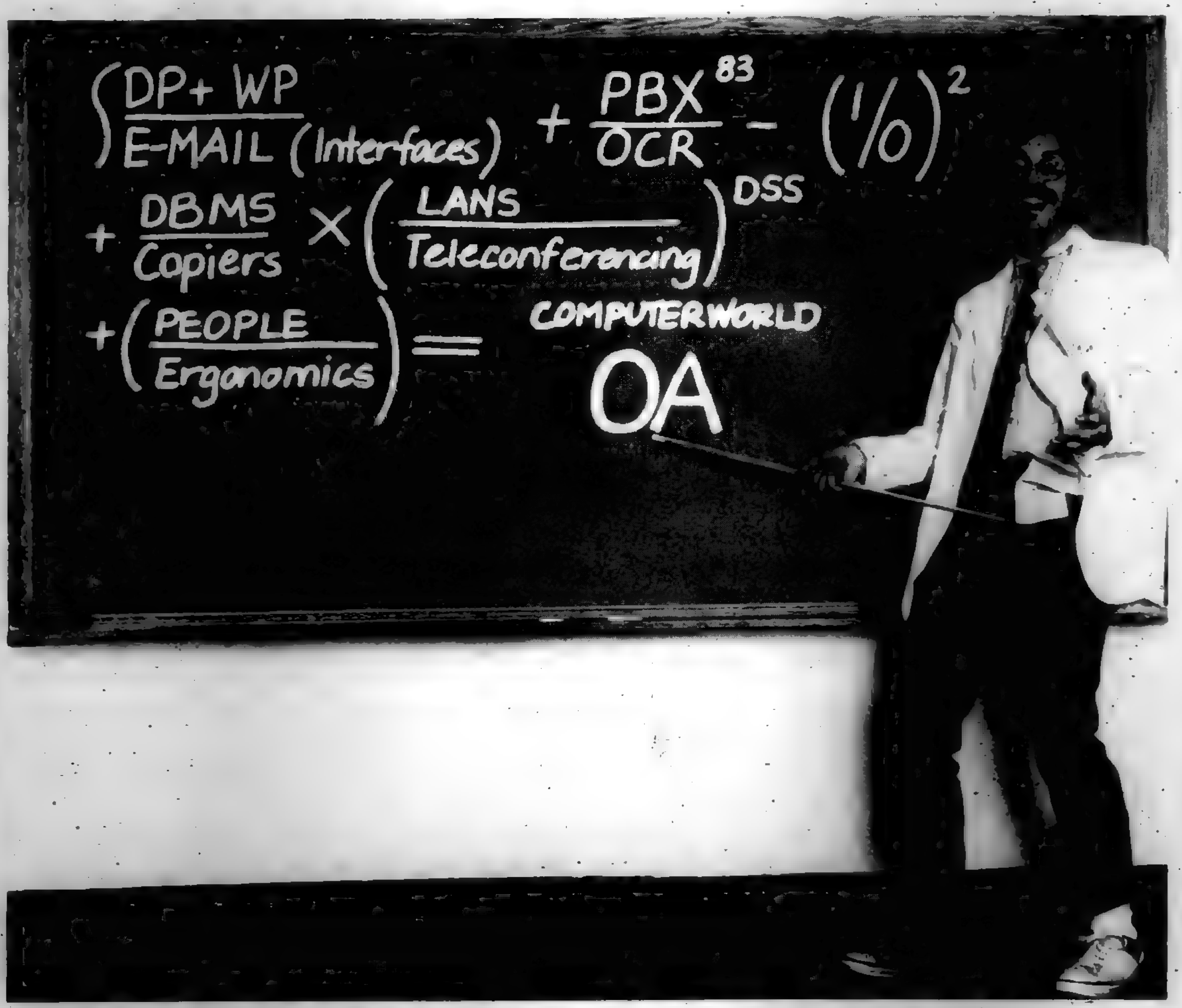

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IBM Micro Gets Tool For Modem

NORCROSS, Ga. — Hayes Microcomputer Products, Inc. has announced communications software designed for IBM Personal Computers using a Hayes Smartmodem Model 300 or 1200.

Smartcom II manages data transfer over the telephone lines and brings the microcomputer, disk drives and printer into the communications. It extends remote computing to a range of users and is built around a menu of program options. A Help feature is also offered, as is display on demand by the user, the vendor claimed.

The program requires 96K bytes of random-access memory, an asnychronous communications card and the operating system DOS 1.10 or 1.00. The software is available for $119. More information is available from Hayes at 5923 Peachtree Industrial Blvd., Norcross, Ga. 30092.

ATM Model Gauges Costs

ROLLING MEADOWS, Ill. — Bank Administration Institute (BAI) has announced an automatic teller machine (ATM) costing model designed to assist banks in determining the cost of an ATM transaction.

The ATM/5 methodology reportedly can be used by all financial institutions regardless of asset size or program scope. A book entitled *ATM Cost Model* includes both fully weighted cost and incremental cost models.

In addition, specific components of the model are discussed, including operating expenses, marketing, income and data processing. Work sheets are provided to assist banks in calculating their own costs.

ATM Cost Model is priced at $40 for BAI members and $60 for nonmembers. Further information is available from the Order Department, Bank Administration Institute, 60 Gould Center, Rolling Meadows, Ill. 60008.

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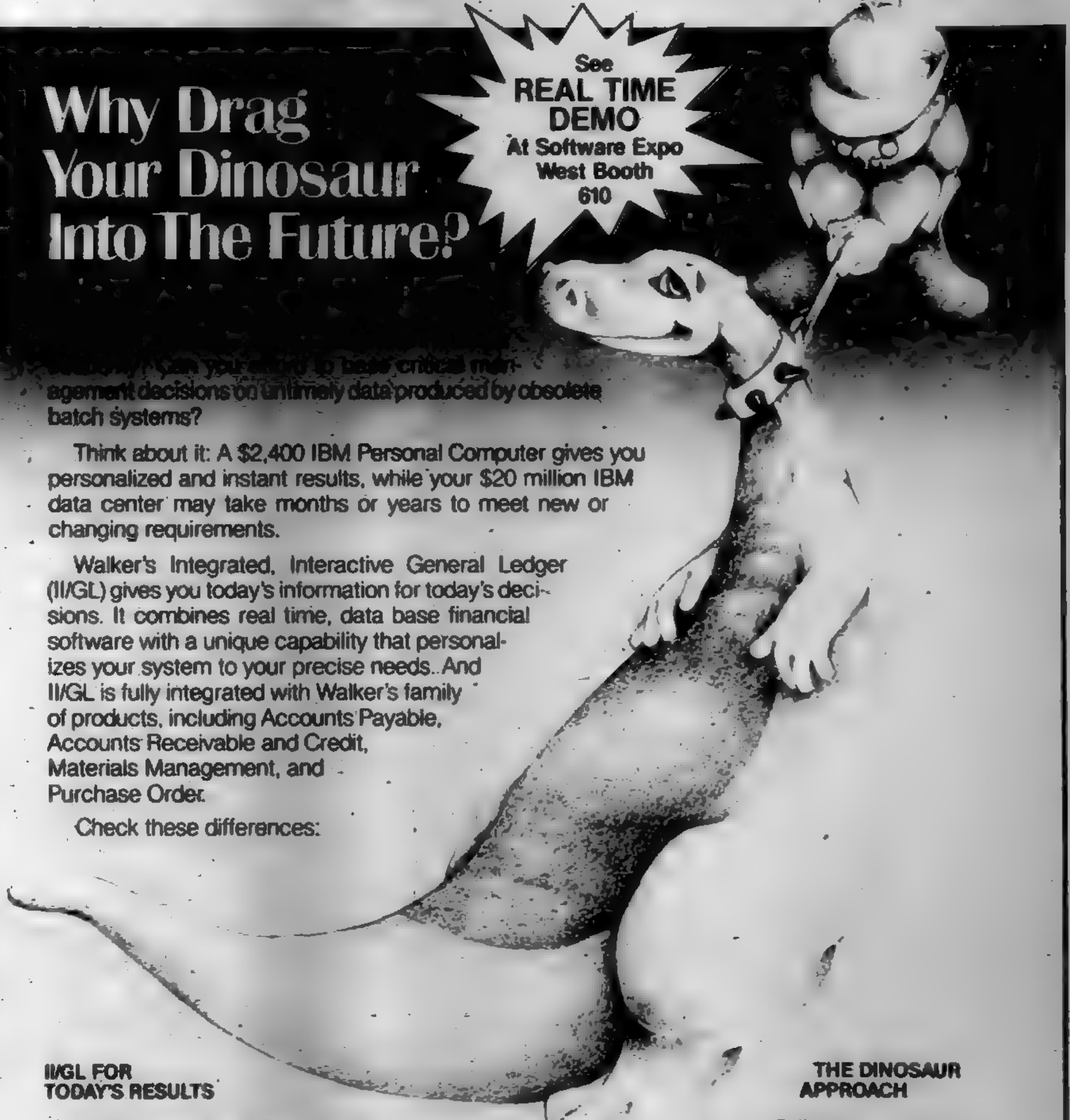

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CDC Ups Cyber Line, Cuts Memory Prices

MINNEAPOLIS — Control Data Corp. has enhanced its Cyber 200 supercomputer line, reportedly boosting the system's central memory capacity by 100%. At the same time, the company also restructured its pricing on that product line.

Using advanced metal oxide silicon (MOS) technology in its Cyber 205 Series 600 memories has allowed CDC to increase the machine's capacity up to 8M 64-bit words, or 16M 32-bit words, the vendor said. Because the larger 16K-bit MOS memories are substantially less expensive than the 4K-bit bipolar technology used in previous CDC systems, central memory prices were reduced.

The Cyber 205 supercomputer is designed to handle computation-intensive problems in areas such as aerodynamics, meteorology, structural analysis, petroleum exploration and production, electronic cirucuit design, high-energy physics and advanced mathematics, according to the vendor. The Cyber 205 can reportedly produce up to 65,000 results with a single instruction.

The range of software and applicatons supported by the Cyber 205 includes Fortran 200; the vendor's Vsos operating system; CDC's Loosely Coupled Network; and Mathlib, a package of mathematical programs that reportedly includes vectorized versions of a number of the commonly used libraries for scientific and engineering applications.

Pricing on the Cyber 205 Series 600 models range from under $5 million up to $12 million, which reflects price reductions of 14% to 39%, the vendor said. Shipments will begin the first quarter of 1984.

In an unrelated announcement, CDC Ltd. of Mississauga, Ont., said it has developed a megaminicomputer called Cyber 815 that reportedly combines mainframe performance with superminicomputer characteristics. This system is intended for processing applications in manufacturing, petroleum, mining, education, electric utilities, energy and government, according to the vendor.

The Cyber 815 reportedly will not be available to the U.S. market.

CDC can be reached for details through Box 0, Minneapolis, Minn. 55440.

Significant Improvements Seen

Data Storage On the Rise: Study

By Tom Henkel
CW Staff

SAN JOSE, Calif. — Improvements in mass storage and image storage systems, accompanied by a steadily decreasing price, will put electronic storage systems into more firms and into more applications.

So said Strategic, Inc., a research firm, in its latest report, "Electronic Filing and the Outlook for Optical Storage." For at least the next 10 years, the three most popular currently available technologies, magnetic media, micrographic and optical memory will also undergo significant improvements, which may change their importance in data processing, the report stated.

With traditional magnetic storage techniques approaching their practical engineering limitations, Strategic predicts that memory manufacturers will make more use of bubble memories as an alternative to disk storage. Some ripe applications for bubble memories include office storage systems, communications networks with embedded directories and data dictionaries.

Automated micrographic systems are

(Continued on Page 62)

Intelligent Controllers Debut For Multibus-Based Systems

BURLINGTON, Mass. — Two intelligent controllers have been introduced by Xylogics, Inc. for Multibus-based computers.

The Model 450 disk peripheral controller can reportedly address up to 16M bytes of memory and control up to four disk drives per board at speeds up to 1.8M byte/sec. When attached to four disk drives, it can access up to 2.4G bytes of disk storage, the vendor said. This product can reportedly support 8- and 16-bit processors, features automatic error correction and supports overlapped seeks for improved system response. Priced at $1,500, it can be plugged into computers from Ampex Corp., Control Data Corp., Fujitsu Ltd., Nippon Electric Co., Priam Corp. and others, the vendor said.

The Model 472 peripheral controller, intended for streaming and start-stop tape drives, resides on one single-height Multibus printed-circuit board. It performs at rates comparable with the 450, and operates on systems from Pertec Computer Corp., Kennedy Co., Control Data Corp. and Cipher Data Products, Inc., according to the vendor. This product is priced at $1,400.

The controllers will reportedly be available in April. Further details can be obtained from Xylogics, located at 144 Middlesex Tnpk., Burlington, Mass. 01803.

Amdahl Trims 6000 Line Prices

SUNNYVALE, Calif. — Amdahl Corp. has announced a 15% price break on its 6000 series storage system, effective immediately. The vendor also upped lease prices from 7% to 16%, depending on system configuration.

The firm also unveiled a two-channel switch for its Model 6880 storage control unit.

A configuration of one 6880 unit and four 6280 disk storage units now sells for $249,000 and leases for $6,940/mo, Amdahl said. The maintenance charge on such a system would be $830/mo.

The two-channel switch reportedly gives the user more flexibility in configuring I/O devices. The 6880 was previously offered only with a four-channel switch. This product costs $77,300.

Further details can be obtained from Amdahl at 1250 E. Arques Ave., P.O. Box 470, Sunnyvale, Calif. 94086.

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Utility Becomes First User Of 3380-Like Disk System

By Susan Blakeney
CW Staff

CHICAGO — Commonwealth Edison Co. last month became the first user of an IBM 3380 plug-compatible disk drive subsystem.

The Edison utility is the beta test site for Control Data Corp.'s 33800 controller and 33800 A4 disk subsystem. The products were reportedly attached to both an IBM 3081 computer and an IBM 3033 multiprocessing system running MVS/SP software.

The 3380 disk drive and its lookalikes have caused a great deal of controversy in the computer industry. In fact, producing a product with 2.52G bytes of memory and roughly 10G bytes of on-line storage per string, capable of driving IBM 3033 mainframes, has become somewhat of an industrywide challenge to disk storage manufacturers.

Other Vendors

IBM has recently started to deliver its 3380 drive, reducing backlogs that have occurred since the introduction of that disk system. Meanwhile, Storage Technology Corp. (STC) has announced a plug-compatible version, but will not begin deliveries until later this quarter, an STC spokesman said.

How do the CDC products hold up, and what are the ramifications for IBM? Unfortunately, under the terms of a nondisclosure contract, Commonwealth Edison is unable to comment on the products' performance, according to computer division supervisor Bill Heines.

However, according to the recently published "IBM Disk Crisis" from Applied Management Systems (AMS), in Medford, N.Y., "IBM has created a major problem by failing to honor its announced delivery dates for the critically needed next generation of data storage products (Model 3380 Disk Drive)."

The report stated that overall demand for disk storage devices will grow by 60% through the middle of this decade. IBM's inability to satisfy this demand might mean its undoing in this product area, according to John Hirsch, vice-president of research at AMS.

Hirsch said, "Competition was expected regardless of IBM's missing the deadline. But the attractiveness of the large-volume disk storage market for [plug-compatible manufacturers (PCM)] became so apparent with the delivery problems.

"The backlog of demand throughout the industry is there. The PCMs recognized a very large window for profit, so they made a crash effort to produce something," he said.

CDC reported that it will produce some 1,000 plug-compatible subsystem units — the equivalent of 2,000 disk spindles each storing 1.2G bytes of data — this year. It predicts even heavier production of this product line for 1984. The heavy volume is projected because of CDC's vertically integrated manufacturing of its own thin-film recording heads, media and disk drives, a spokesman said.

Meanwhile, IBM's 3380 deliveries have cut back on the orders' lead time. In addition, prices on the 3380 and 3880 were recently slashed by 15% [CW, Dec. 27-Jan. 3].

For Scientific Processing

Univac System Uses 1100/82

BLUE BELL, Pa. — Sperry Univac has announced a high-performance scientific processing system that includes the firm's 1100/82 computer.

Based on the Univac 1100/80 Array Processing System, the scientific Vector Processing System (VPS) reportedly provides direct support of interactive graphics/development terminals and data base technology, the vendor said.

The key applications for the VPS cover array or vector computation areas such as signal processing, weather forecasting, radar/sonar and oceanographic computation. Other uses are in image processing of satellite data and nuclear analysis, reservoir simulation, circuit design and frequency spectrum analysis, according to the vendor.

This product can be purchased for $4,400,000, or leased for $122,000/mo on a five-year plan. The vendor is based at P.O. Box 500, Blue Bell, Pa. 19424.

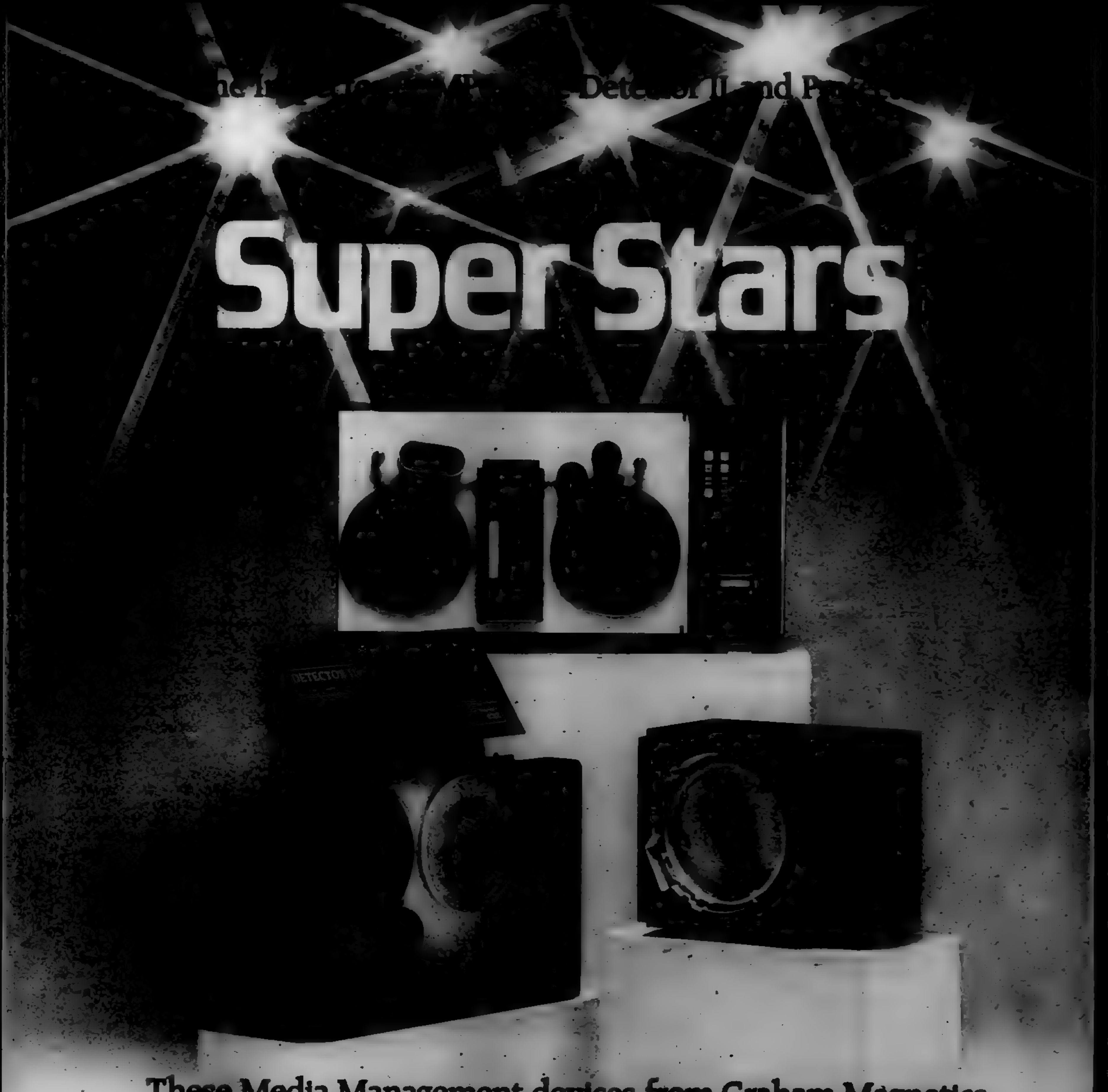
CFR Line Fits Wang VS

HAVERHILL, Mass. — CFR Associates, Inc. has expanded its line of Wang Laboratories, Inc.-compatible peripherals to include VS-compatible 75M-, 90M- and 288M-byte disk storage units and cartridge module drives and Wang 2200 LVP/MVP-compatible 80M-byte cartridge Control Data Corp. Phoenix drives.

Also announced were MVP/LVP-, VS- and OIS-compatible serial and parallel 300- and 600 line/min band and chain printers. All equipment is said to be 100% compatible with Wang VS and 2200 product lines.

Prices for the drives are as follows: $5,800 for 75M-byte drives, $6,500 to $8,500 for 90M-byte drives, $11,500 for the 288M-byte version and $6,500 to $8,500 for the Phoenix drives. Printer prices include $3,900 for the serial 300 line/min band printer and $5,200 for the 600 line/min version; $5,200 for the parallel 300 line/min band printer and $7,400 for the 600 line/min version; and $4,300 for the serial 300 line/min chain printer, according to a spokesman.

The units offered reportedly include new as well as used (refurbished) devices at substantial savings. The firm can provide system installations and alternative maintenance programs through alternate vendors. CFR is located at 18 Granite St., Haverhill, Mass. 01830.



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Microcomputers Impacting Storage, Report Says

SAN JOSE, Calif. — Personal computers, or microcomputers, are having the most profound effect on data storage, according to a report recently released by Strategic, Inc.

While microcomputers tend not to employ major innovations in storage technology, they have created a situation where relatively inexperienced users set up and control their own electronic files, often replacing paper filing systems.

The research firm noted that today about 887 billion paper documents are stored in various personal, business and archival files. Even if the price of electronic storage stayed at its current level for the next 10 years, the soaring cost of managing paper documents would make electronic storage an attractive option, if not a necessity.

One of the key uses for microcomputers includes the ability to interconnect systems to provide files for correspondence and management reporting. Microcomputers can also be used to create relatively cheap graphics, Strategic said, noting that more than one million units will be installed in businesses by 1986. However, the widespread use of microcomputers is not without problems. The units, at least at this point, tend to be difficult to interface with larger processors and appear to have difficulty in image processing applications, according to the report.

Storage System Use Seen Rising

(Continued from Page 59)

often practical for very large files with relatively low access but rapid response requirements. But the technology, which now includes microfilm and microfiche, will probably peak in the mid- to late 1980s, Strategic said.

Optical memory, the ability to store images as well as data, is currently most popular in the form of videodisks. However, the technology is relatively new, and few actual products are available. An optical disk has a high recording density, at least four times the density of IBM's biggest disk drive, the 3380, Strategic said. Optical disks tend to have access times similar to magnetic disk drives and very favorable times when compared to mass storage subsystems. But Strategic noted the technology is not without problems.

Strategic said that most of the problems stem from the newness of the technology. For example, despite some claims that optical disks can last for up to 100 years, those claims have yet to be proven. Erasability is another controversial issue. Most commercially available optical disks cannot be erased (although some vendors say they have developed technologies to erase optical disks).

Hardware compatibility is also a problem. At this point, there is no industry standard for linking optical disks to computer systems. This fact will keep the price for optical memory products relatively high until a standard is approved, the firm said.

Finally, Strategic noted that currently there is little software available to support optical disks.

The Strategic report costs $2,000 and is available from the vendor at 4320 Stevens Creek Blvd., San Jose, Calif. 95129.

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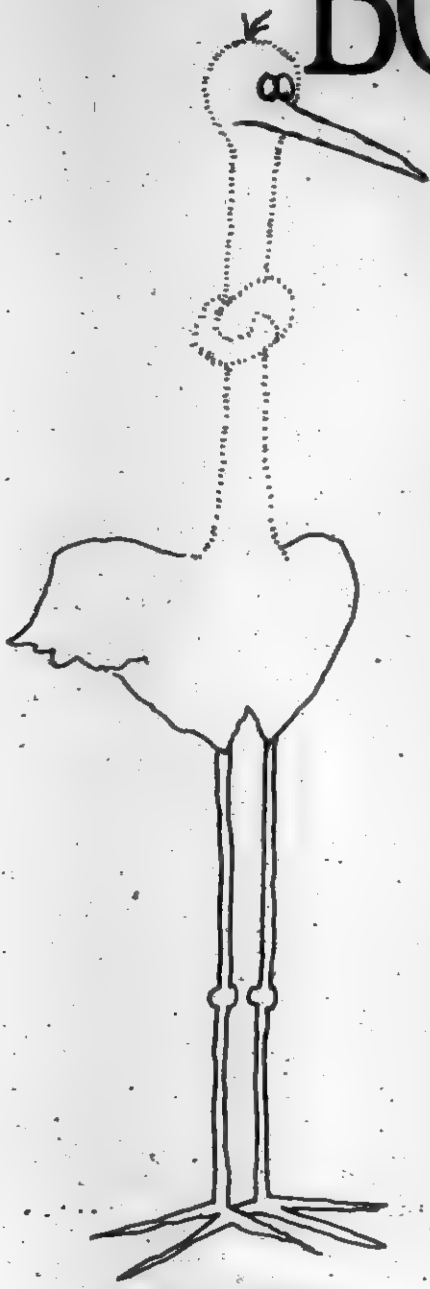

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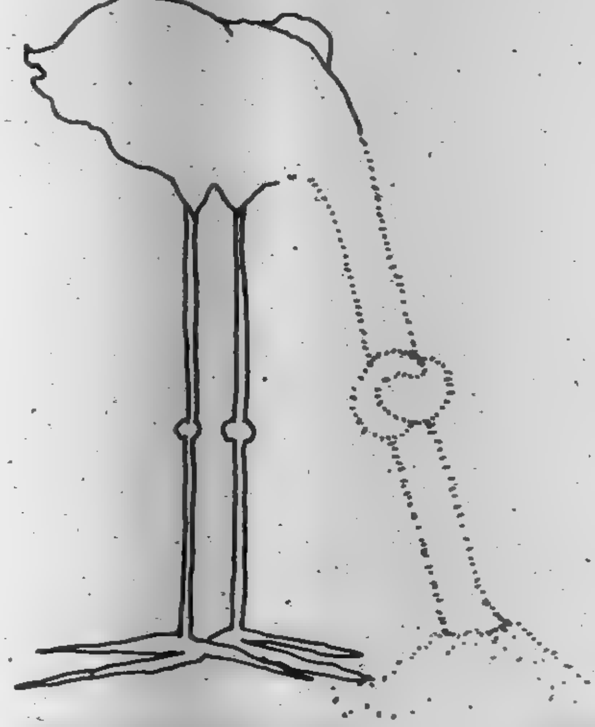

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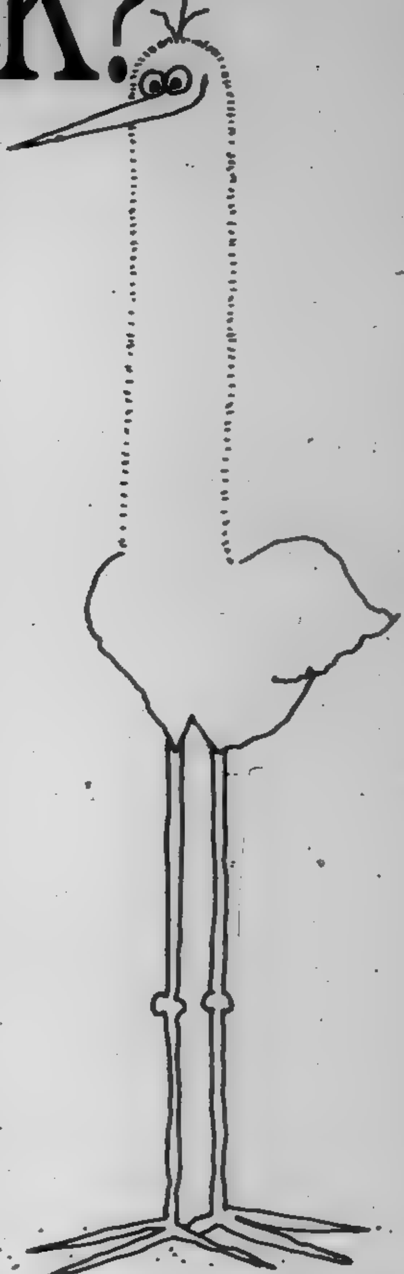

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Basic Four Cuts S/10 Cost $1,000

ALBUQUERQUE, N.M. — Basic Four Business Products Corp. has announced a $1,000 price reduction on its S/10 small business computer, which now sells for $4,995. The price of the Office Display Terminal, the add-on terminal for the S/10 system and larger Basic Four computers, was also cut and it now costs $2,595.

Based on twin Zilog, Inc. Z80 microprocessors, each with 64K bytes of random-access memory, the S/10 system comes with two dual-density 5¼-in. diskette drives with 630K bytes each.

Basic Four is at 601 San Pedro N.E., Albuquerque, N.M. 87108.

For Board Design

Genrad Unwraps CAD Net Unit

CONCORD, Mass. — Genrad, Inc. has unveiled Cadmate, said to be the latest in a series of networking products offered by the company to enhance the manufacturing process for computer-aided design (CAD) of electronic equipment.

Cadmate's hardware and software utilities reportedly allow a user to download automatically description files for printed-circuit boards from a Computervision Corp.; Applicon, Inc.; Scientific Applications; or Racal-Redac, Inc. CAD system to Genrad automatic testing equipment systems.

The product reduces the time and cost involved in the manual data entry formerly required to generate board-test programs, a spokesman said. It operates in conjunction with software supplied by the CAD system manufacturer to create file descriptions of printed-circuit board circuits. To meet specific user requirements and hardware configurations, Genrad supports five different options for file transfer: IBM's 2780 bisynchronous communications, Digital Equipment Corp.'s Decnet and nine-track magnetic tape, floppy disk (RX01 and RX02) and paper tape.

The Cadmate package, including hardware, software and documentation, is available for immediate delivery. Prices begin at $16,500, depending on configuration, from the vendor located at 300 Baker Ave., Concord, Mass. 01742.

SSI Unveils IBM Interface

FORT LAUDERDALE, Fla. — Southern Systems, Inc. (SSI) has announced IBM 3270 Type A and B interfacing capability for its line of printer systems.

The IBM compatibility is available as a complete printer system functioning with SSI's M, B and QT series printers in speeds ranging from 200 to 1,800 line/min.

System/34- and System/38-compatible printer systems are also available and include twin-axial connector with cable-through, transparent mode and an auxiliary diagnostic panel, the vendor said. SSI printer systems for IBM System/34 and System/38 start at $5,500.

Type A 3270 connections are said to be Synchronous Data Link Control-compatible with IBM cluster controllers 3274 and 3276 with A coaxial connectors.

Type B is bisynchronous and attaches to IBM cluster controllers 3271, 3272 and 3274 with B connectors.

Printer system prices for the IBM 3270 Type A and B interfacing start at $4,500 from SSI at 2841 Cypress Creek Road, Fort Lauderdale, Fla. 33309.

Transformer Announced

CARSON, Calif. — Computer Power Systems, Inc. has announced an isolation transformer for medium- to large-scale systems.

Called Iso-Max, the unit was designed to help protect systems from power disruptions such as transients and electical noise.

The unit features ultra high-grade electrostatic shielding, all-copper shielding and voltage adjustment taps, the vendor said.

Units cost from $1,110 to $3,500, the vendor said from 18150 Figueroa St., Box 6240, Carson, Calif. 90749.

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- **Conversion: When is it possible? How is it achieved?**
- **How much customization is necessary when installing a package?**
- **How long does it take to get an application package up and running, compared to in-house systems? What is the procedure?**

If you use, buy or need applications software packages, you won't want to miss this special report. Turn to Computerworld next February 28th — and get your packages off and running.

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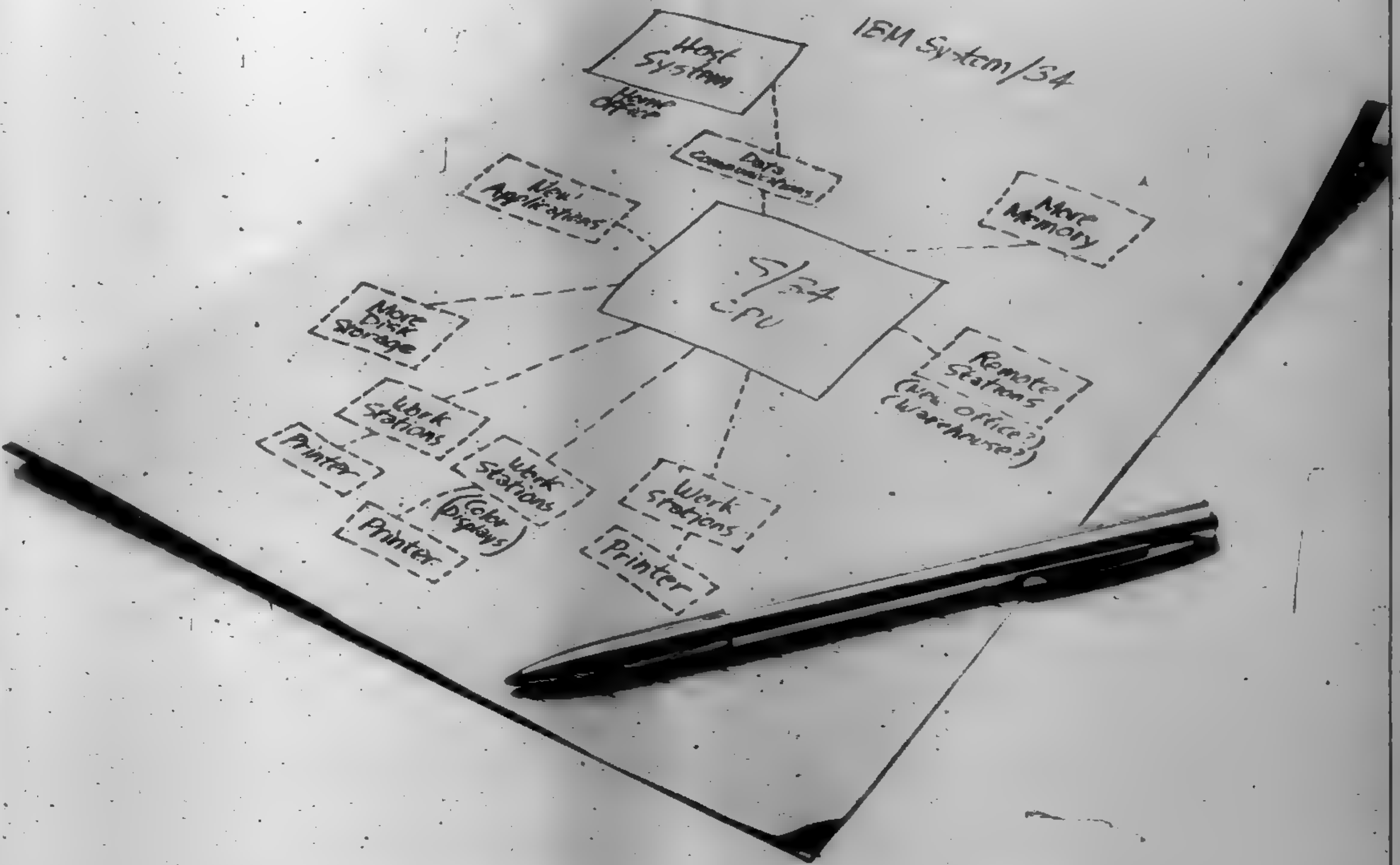

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Integrated Accounts System Aids Small Businesses

GLENVIEW, Ill. — Zenith Data Systems Corp. has introduced the Integrated Accounting System, which was designed to aid small businesses in transferring their bookkeeping systems to desktop computers.

The bundled hardware/software system was designed to offer speed and ease of use through the inclusion of a high-speed Winchester disk drive. Accounting functions such as general ledger, accounts payable and receivable, sales invoicing and inventory management are on the main menu.

User time is saved by eliminating the need to find a diskette and load a new program when going from function to function, a spokesman said.

Included is the Zenith Z89 computer with memory expansion to 64K bytes of random-access memory, Z67 Winchester disk drive with 8-in. floppy back-up, Magic Wand word processing, Digital Research, Inc.'s CP/M, Microsoft Corp.'s Microsoft Basic and five Peachtree Software, Inc. accounting packages.

A reference guide is also provided with the system to aid the transfer of the user's bookkeeping system onto the desktop computer.

The suggested retail price of the package is under $7,000. Zenith Data Systems is located at 1000 Milwaukee Ave., Glenview, Ill. 60025.

For Small-Business Mart

Dual Microprocessor Out

AUSTIN, Texas — Challenge Systems, Inc. has released a dual-microprocessor computer system designed for the small-business market.

The CS1000 can be configured as a single-user, entry-level system or be expanded to a multiuser system with multitasking and networking capabilities, the vendor said.

Hardware for the entry-level system includes the dual processors with 64K or 128K bytes of random-access memory; a CRT display, a detached keyboard; and two 8-in. double-sided, double-density floppy disk drives. It operates on Digital Research, Inc.'s CP/M and I/OS.

Pricing for this product ranges from $5,000 to $15,000. Sales are being handled by Systems Sales International, Inc. at 509 W. 18th St., Austin, Texas 78701.

Corona Updates Disks, Cuts Price

WESTLAKE VILLAGE, Calif — Corona Data Systems, Inc. has announced price reductions and enhancements on its line of 5¼-in. Winchester disk subsystems for IBM's Personal Computer and Apple Computer, Inc.'s Apple II microcomputers.

Prices on the Personal Computer hard disk, available in 5M- and 10M-byte capacities, have been cut $200 to $1,795 and $2,295, respectively. Prices for similar drives for the Apple II were cut by $300 to $2,195 and $2,695, respectively, the vendor said.

In addition, the firm announced an external version of the Personal Computer hard disk. The unit sits outside the IBM processor and is available in 5M- and 10M-byte capacities. The 5M-byte version costs $2,195 and the 10M-byte unit costs $2,695. The vendor is located at Suite 110, 31324 Colinas, Westlake Village, Calif. 91361.

Matrix Printer Out for TRS-80

FORT WORTH, Texas — Radio Shack has added a dot matrix printer with graphics capability to its line of TRS-80 microcomputer peripherals.

The DMP-100 reportedly prints 50 char./sec at 10 char./in. (80 col at 276 line/min) and has a bit-image mode to allow printing of fully addressable, high-density graphics. Using an optional screen-print program, the DMP-100 can produce detailed black-and-white graphics printouts similar to those on the TRS-80 Color Computer screen display.

The printer features 80 uppercase and lowercase five by seven dot matrix characters that can be printed on an 8-in. line with underline capability; a 480-byte, full-line dot buffer to increase graphic throughput; selectable parallel and serial interfaces (600/1200 bit/sec); and 4½-in. by 9½-in. fanfold paper, the vendor said.

The printer measures 5-5/16-in. by 16-in. by 8¼-in. and operates from 120 Vac, 60 Hz power and 15W. It costs $399 from Radio Shack Computer Centers and stores.

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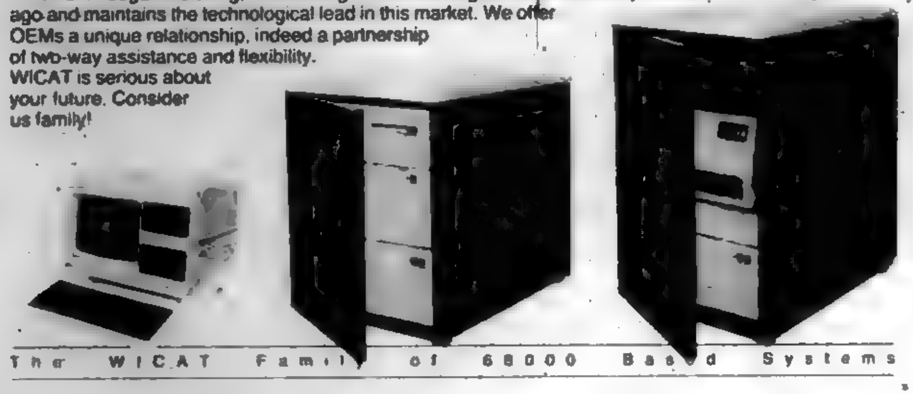
WICAT began installing, maintaining and enhancing our 68000 based product line over two years ago and maintains the technological lead in this market. We offer OEMs a unique relationship, indeed a partnership of two-way assistance and flexibility. WICAT is serious about your future. Consider us family!



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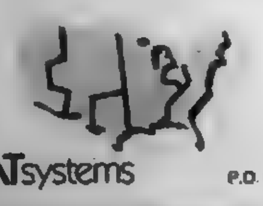

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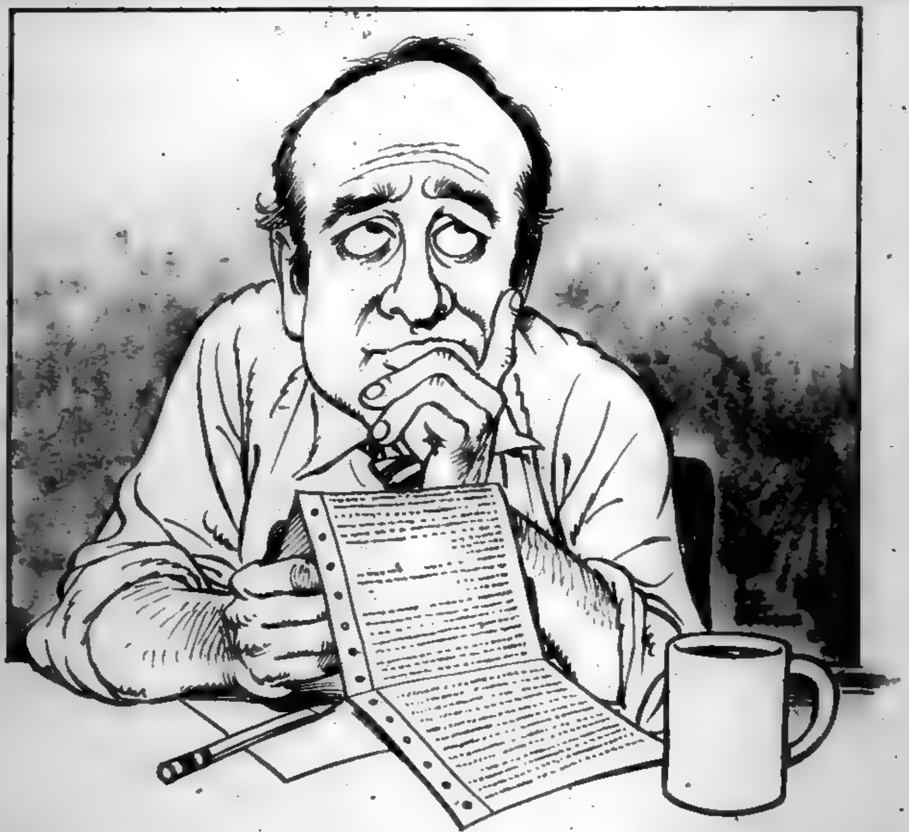


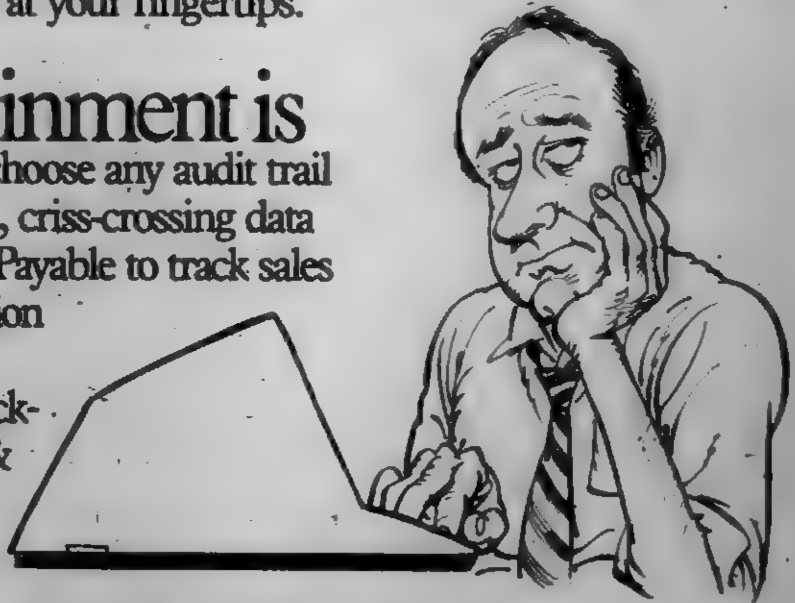
You use the new HiLite from McCormack & Dodge.

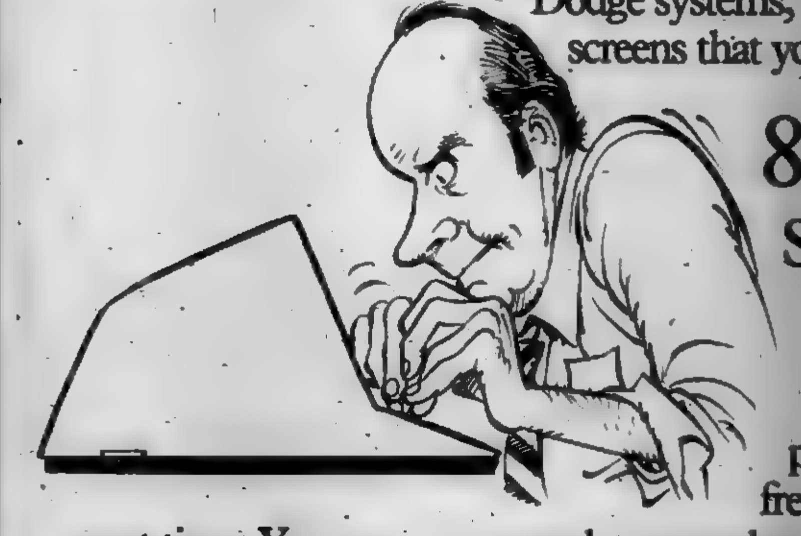
8:00 a.m. The boss says sales expenses are too high.

HiLite is a true accounting breakthrough. It lets you come up with answers in minutes instead of hours or days. No on-line query system in the world matches its ability to research day-to-day problems. It literally puts every piece of financial information you have at your fingertips.

8:02 a.m. Travel and entertainment is out of whack.

With HiLite, you can choose any audit trail and follow it to completion, criss-crossing data bases at will. Move from General Ledger to Accounts Payable to track sales expenses. Shift into Fixed Assets to pinpoint depreciation discrepancies. Change course 180 degrees and probe Personnel/Payroll for minority quota details. Search backwards and forwards through any and all McCormack & Dodge systems, using the screens that you've built.



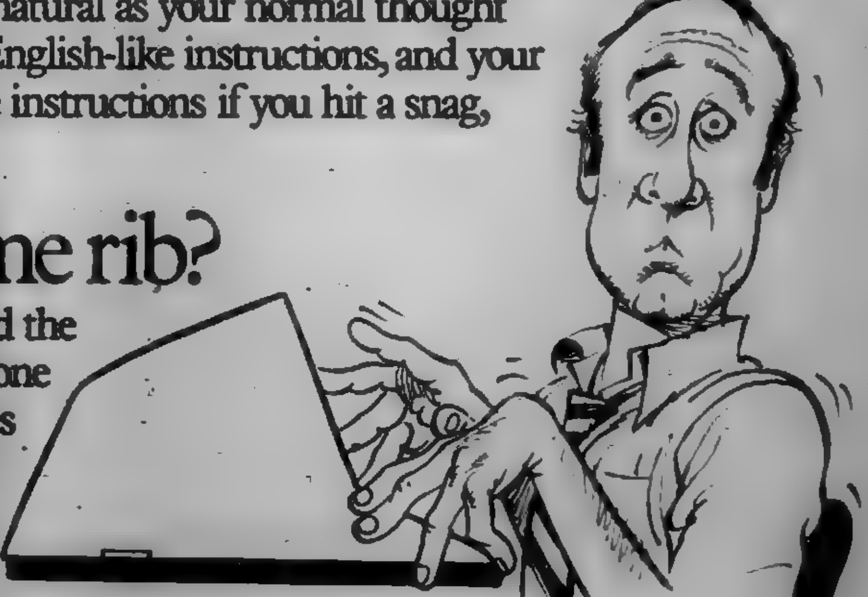


8:04 a.m. Let's look at salesmen's expense reports.

Remember overnight turnaround times? Remember inching your way through mountains of paper? With HiLite, these are problems of the past. Because you can pursue your investigation with ease at your own desk, free of hassles, free of haggling for DP department time. You use a command process that's as natural as your normal thought process. You just fill in the blanks with friendly, English-like instructions, and your answer pops up on the tube. You even get on-line instructions if you hit a snag, simply by pressing a button.

8:06 a.m. $1,000 for prime rib?

HiLite infinitely expands the dimensions—and the value—of all McCormack & Dodge systems. It's one more example of an idea other software companies are only talking about, but we're releasing as a finished product. One more example of tomorrow's software today.



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Sales and support offices throughout North and South America, Europe, Asia, Australia and South Africa.

Optical Mouse Announced For CAD/CAM Applications

BRISBANE, Calif. — An optical mouse, designed to ease cursor positioning in computer-aided design and manufacturing (CAD/CAM) applications has been introduced by the Computer Products Division of USI International.

Called Optomouse, the device consists of a small box with two rocker switches that roll on the x and y axes on a flat surface. The position of these switches and the box reportedly communicate movement to the computer.

This mouse reportedly works with any CAD/CAM, graphics or personal computer with an RS-232 bus interface. It costs $300, the vendor said from 71 Park Lane, Brisbane, Calif. 94005.

Bits & Pieces

STS System for Managing Pay-TV Subscribers Bows

EASTCHESTER, N.Y. — A system for managing pay-TV subscribers has been released by G and Z Systems, Inc.

STS reportedly handles all subscriber invoicing, receivables and maintenance reporting and provides a variety of reports on maintenance problems, such as apartment building totals and building owner's commissions.

The system has a 6,000-subscriber capacity and comes with a 6.7M-byte hard disk and integral cartridge-tape backup, as well as a high-speed dot matrix printer and a single terminal.

The STS systems start at $15,490 from G and Z Systems, 187 Main St., Eastchester, N.Y. 10707.

Turnkey System Debuts For Publishing Industry

GLENDALE, Calif. — The National Accounting Equipment Corp. has announced a turnkey system especially tailored for the publishing industry.

Publisyst is composed of a number of separate software modules: accounting/advertising, circulation/reader service, editorial/word processing and print production. A data base management system is also included to provide each user with the ability to modify his system in order to satisfy his personal set of requirements, according to the vendor.

The bundled turnkey is priced at $50,000, the vendor said from 6814 San Fernando Road, Glendale, Calif. 91201.

Presentation Packs Support Tektronix Digital Plotters

BEAVERTON, Ore. — Tektronix, Inc. has introduced three presentation products said to support the company's 4662 Option 31, 4663 and 4663S Interactive Digital Plotters.

Collectively called Presentation Packs, these products include 50 sheets of Tektronix's new Quick Dry Plotter Film, a new multicolor nine-pen pack, 25 frames and a covered pen tray and storage box. The transparent film provides high-quality visuals that dry in seconds, according to the vendor.

Each Presentation Pack is priced at $60, and Tektronix can be reached through P.O. Box 500, Beaverton, Ore. 97077.

IEEE-488 Interface Added To TDX Tape Subsystems

HALESITE, N.Y. — TDX Peripherals Division of Gaw Control Corp. has added an IEEE-488 interface to its family of tape subsystems.

The IEEE-488/General Purpose Interface Bus is said to be compatible with Ansi and IBM ½-in. formats and is suitable for hostile environments. Automatic error control and dual-buffered recording are standard features.

The unit operates in programmable and nonprogrammable modes and contains programmable control, search and edit capabilities, the vendor said. Prices start at $7,000 for a fully interfaced system from the firm at 148 New York Ave., Halesite, N.Y. 11743.

Series 81000 Power Systems Out in 50-Hz, 60-Hz Models

SAN DIEGO — Topaz, Inc. has announced a series of uninterruptible power systems (UPS).

The Series 81000 is comprised of a line noise suppressing Ultra-Isolator, rectifier, battery charger, battery, static inverter and transfer switch. The use of a separate battery charger and rectifier is said to be a unique design that eliminates the need to regulate dc power to the inverter.

The Series 81000 UPS is available in 50-Hz and 60-Hz models and in power ratings from 3 KVA to 15 KVA. Prices start at $10,800 from the firm at 3855 Ruffin Road, San Diego, Calif. 92123.

Electronic Mail/Office Automation Offers New Telecommunications Profit Opportunities!

Just a few years ago, office automation was a word processor and stand-alone pool. Now, thanks to electronic mail, teleconferencing and facsimile, office automation affects every corporate person and poses major new management traffic problems for telecommunications.

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Eliot Gold
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Dr. Michael Zisman
"Datacom & OA Bridges"

Carol Gaffney
"How to Fail at OA"

Susan Pereya
"Teleconferencing Audio"

Dr. Cornelius Sullivan
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"Power Politics in OA"

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Inadequate Training Cited

User Fears Still Block OA: Consultant

By Jim Bartimo
CW Staff

While computer literacy is impossible to measure, experts agree that acceptance from the executive and the secretary is growing. But computer acceptance is still deterred by longstanding fears of displacement, inadequacy and loss of control. These issues are often compounded by those who control high technology in the office when inadequate training is combined with poor communications.

"A lot of people in this [computer] business are mostly aware only of the good stuff about automation," said Thomas Hannagan, president of the consulting firm, Thomas A. Hannagan & Associates, Inc. "But they don't recognize that there are other factors and people don't think it's such a great thing."

MIT's Harley Shaiken, an outspoken critic of poorly implemented office automation, said that computer literacy is indeed increasing, but only in spite of the problems. "I don't think there's an inherent resistance to technology," he said.

First Taste

When middle managers get their first taste of technology, problems arise for the technology provider. "The technology provider has to recognize that he's dealing with a different equation than before," Hannagan said. Automation had often been directed at the blue-collar worker who is used to taking orders, but now "the executive is a little harder to push around.

"In a factory, people are cogs in the procedure," Hannagan said. "This is less so than in the office, but people are being automated" more so than are procedures, he continued.

On the clerical level, computer acceptance develops in stages, according to Janice Blood of 9 to 5, the National Association of Working Women. "Generally what we've found is that initially everyone is excited about it," she said. "The second stage is that they're disappointed and haven't had enough training. That leads to people having complaints."

Implementation is as important an issue at the clerical level as it is at the management level. If the technology provider or upper management uses automation to make work routine, there will often be dissatisfaction and eventually, turnover, Blood said. Acceptance of technology depends on what is done with the extra time pro-

(Continued on Page 72)

Wang Extends Remote Net

LOWELL, Mass. — Wang Laboratories, Inc. has introduced three enhancements to its Remote Wangnet wide-area network. The enhancements are: an increased number of workstations, document transfer capabilities between support systems and extended low-end support capacity.

Remote Wangnet is a distributed networking facility said to enable users of the Wang VS, OIS, 2200 and Professional Computer systems to share processing resources and files in geographically remote environments, providing a mix of distributed and centralized processing.

License fees for the Remote Wangnet software range from $150 to $1,800 depending on the amount of hardware and user requirements from One Industrial Ave., Lowell, Mass. 01851.

WP Package Fits VAX-11

BURLINGTON, Mass. — Interactive Systems, Inc. has announced a native-mode word processing package for Digital Equipment Corp. VAX-11 computers.

Digitext contains the facilities to create, manage and maintain documents, standard text, address files, correspondence and other files defined by the user, the vendor claimed.

Utilizing the menu approach, the user is guided through the various operations of the package. The major components of Digitext include a file manager, text editor and a print facility that supports a variety of matrix and letter-quality printers, a spokesman for the vendor said.

Digitext also provides a utility module to convert Digitext files into sequential files and vice versa, as well as the capability to maintain an unlimited number of names and addresses for use in correspondence and bulk mailing, according to the vendor.

Priced at $7,500, the package is available from the vendor at 131 Middlesex Tnpk., Burlington, Mass. 01803.

NCR Boosts Worksaver; Offers Graphics Package

NCR Worksaver Workgraph

DAYTON, Ohio — NCR Corp.'s Office Systems Division has unveiled an addition to its Worksaver word and information processing family and a business graphics package that operates with optional Multiplan software on the WS-200 series.

The WS-150 can function as a stand-alone system, cluster station or master station for a departmental system supporting up to four additional workstations selected from the Worksaver 100 or 200 series.

System features include 384K bytes of random-access memory expandable to 512K bytes; a dual-density, double-sided 5¼-in. miniflexible disk and a sealed 16M-byte mini-Winchester drive, all housed in a desktop processor cabinet. The maximum storage capacity of the mini-Winchester drive is equal to approximately 2,700 pages of information, the vendor claimed.

The WS-150 may be purchased for $10,995 or rented on 12- or 36-month plans for $408 and $348/mo, respectively.

The new business graphics package is known as Workgraph. It is capable of producing line, bar, pie and combination charts of varying sizes, according to the vendor. Receiving statistical information directly from the Multiplan software, it reportedly allows easy transformation of that information into varied graphics forms.

The package requires a graphics board, costing $1,750, and a software interface, costing $250 on a one-time license basis or $132 annually.

A graphics plotter is also available for $1,150 or on a lease basis for $60/mo on a one-year plan and $48/mo on a three-year plan.

NCR's Office Systems Division is located in Dayton, Ohio 45479.

From Any Phone

Voice Mail Supports 100

BRIGHTON, Mass. — Voicetek Corp. has introduced a low-end stand-alone computerized voice mail system said to support 100 users.

The Voicestor-M/100 permits users to place, retrieve and forward voice messages and verify delivery. Messages can be placed from any telephone for retrieval at a future time. They can be retrieved from any telephone or delivered to any one or more parties immediately or at a specific time.

Users can also forward received messages to other parties, adding their own remarks. Recorded prompts lead users through a variety of transaction options. Message capacity ranges from 400 to 20,000 messages or up to 120 hours of messages. Larger systems that will support 2,000 are also available.

The system was designed to be used with all existing telephone switching systems including both on-premises Private Branch Exchange and off-premises switching equipment, the vendor claimed.

The Voicestor-M/100 system is available for $49,500 from Voicetek, 15 Soldiers Field Place, Brighton, Mass. 02135.

DEC-Compatible Tools Repriced

PLACENTIA, Calif. — Data Processing Design, Inc. has announced a new pricing structure for its Digital Equipment Corp.-compatible software packages — Word-11 word processing and IB Graph business graphics.

Pricing is now based on the size of the DEC processor instead of the type of operating system, a vendor spokesman said.

The Word-11 Version 2.8 offers list processing, built-in dictionaries, automatic table of contents, footnoting and other features. The new prices for the package range from $3,500 to $9,500, depending on which DEC machine it runs on.

The IB Graph package is now available for use on RSTS/E systems for between $5,500 and $7,500, depending on the machine. More information is available from Data Processing Design, Inc., Suite F, 181 W. Orangethorpe, Placentia, Calif. 92670.

WP Conversion System Out

CARSON, Calif. — A word processing conversion system has been announced by Ticor Printing Group, Inc.

The system provides automatic conversion of a customer's existing word processing data to a new system format. According to the vendor, the system will be offered to law firms and corporate clients whose data bases require conversion as a result of mergers, the unification of systems employing different equipment or the acquisition of new equipment from a different word processing vendor.

The word processing system is priced on a per disk basis. The single-unit price for one disk is $45, with volume discounts available, Ticor said from 966 E. Sandhill Ave., Carson, Calif. 90746.

RS-232 Link Fits Genius Display

HASTINGS, Minn. — Micro Display Systems, Inc. has announced an RS-232 interface for its Genius full-page display.

The full-page display, 57 lines by 80 characters, allows the operator to perform word processing, financial modeling and software development tasks. The RS-232 interface functions at up to 19.2K bit/sec with all interface functions controlled by a Zilog, Inc. Z80 microprocessor. Internal memory of 16K bytes provides buffering and an internal screen memory, the vendor said.

The RS-232 version is 16-in. high, 13-in. wide and 17-in. deep and weighs 40 lb. It operates at 100/120V-60Hz or 220/240V-50 Hz, according to a spokesman.

The RS-232 version costs $1,795. Micro Display Systems is located at 1310 Vermillion St., Hastings, Minn. 55033.

DP Acceptance Still Deterred

(Continued from Page 71)

vided by automation.

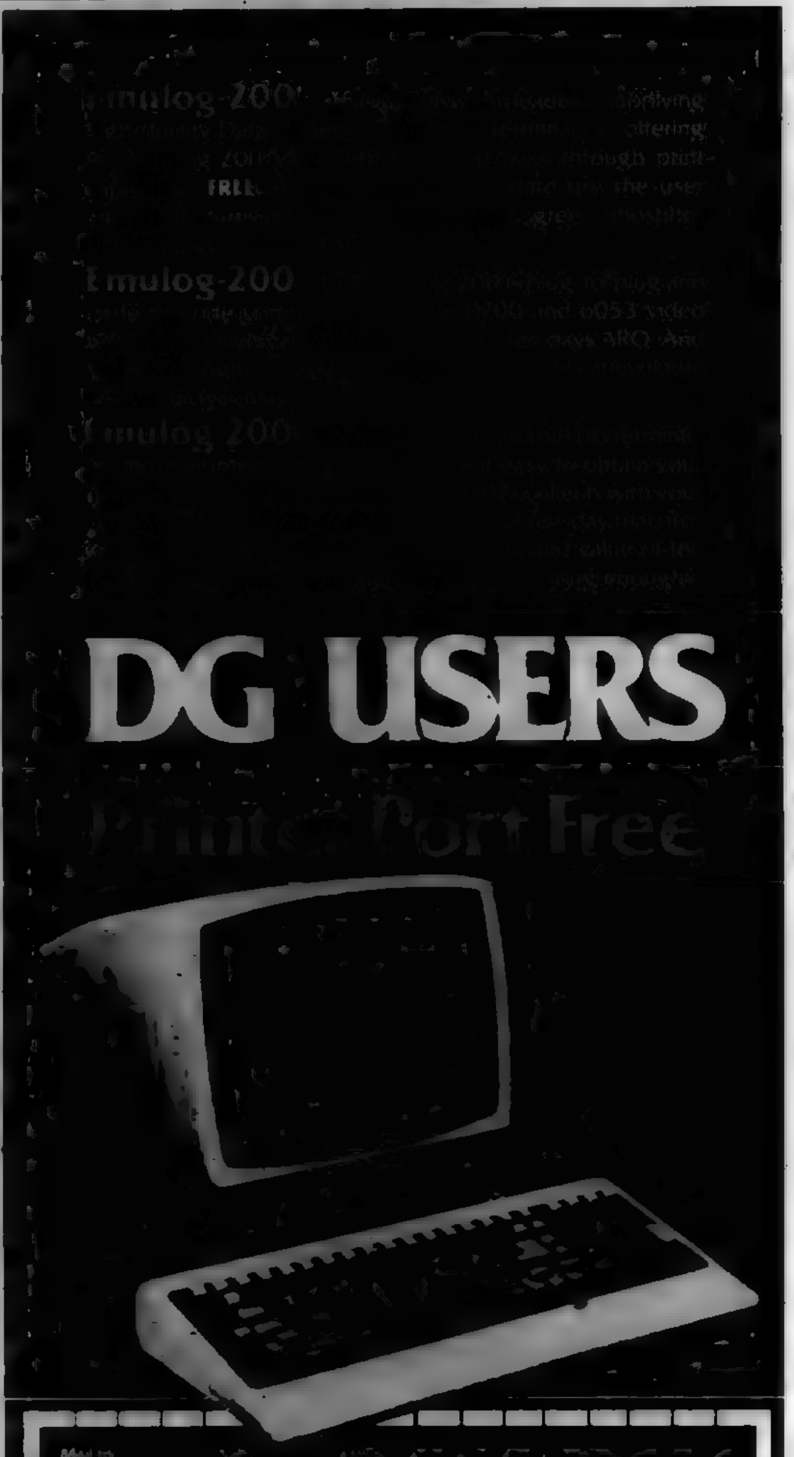
According to Hannagan, "I think that organizations [like 9 to 5] aren't antitechnology, they're anti-brute force. If you look at some of the implementation that has gone on, it's surprising that they're as civil as they are."

Naturally, rejection of automation comes with job displacement. "It's only beneficial to the worker if he has a job to be productive in," Shaiken pointed out.

Hannagan places the acceptance of technology on the shoulders of user and vendors alike. Automation will be accepted on the management level when it is used to solve business problems and not implemented or sold for automation's sake. For instance, some not-so-user-friendly electronic mail packages have met with high acceptance because they address a communication problem.

While technology still outstrips the user's ability to accept it, Hannagan said users will eventally become more comfortable with automation. One of the major reasons people will grow used to technology is its proliferation in such everyday products as automobiles and watches.

"You've got [Atari, Inc.] helping you out," Hannagan said.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TECHNALYSIS CORPORATION

National Semi Acquires POS Terminal Maker

By Bill Laberis
CW Staff

MAYNARD, Mass. — National Semiconductor Corp. last week agreed to pay about $50 million to acquire financially ailing Data Terminal Systems, Inc. (DTS) in a move designed in part to bolster National Semi's diversification efforts.

The acquisition, analysts say, also represents a great shot in the arm for National Semi's Systems Division, dedicated to the point-of-sale (POS) equipment for which DTS had become a market favorite before its fortunes began to slide in 1980.

"It complements our business nicely," said Johnny Humphreys, National Semi's Systems Division manager, in a phone interview concerning the acquisition. "We feel we can manage them back to profitability."

DTS posted a $200,000 profit on sales of $26 million — its first profit in two years — in its last reporting quarter ending Oct. 31. The company had reported losses totaling $9.5 million during the first nine months of 1982 and has reduced its work force by 40% since 1980.

Humphreys said DTS was caught in a "declining spiral" marked by falling customer confidence compounded by a sluggish economy.

Humphreys declined to comment specifically on the roots of DTS' problems, noting, however, that "the company has had several management changeovers."

Kim Myher, industry analyst for International Data Corp., speculated DTS

(Continued on Page 76)

Federal Government Still No. 1 User: GSA

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The federal government, showing no sign of relinquishing its position as the largest computer user in the world, added almost $270 million worth of mainframes and peripherals to its inventory during fiscal 1982, bringing the total dollar value of its equipment to slightly more than $5.8 billion as of Sept. 30, 1982.

According to statistics compiled by the General Services Administration (GSA), the government owned or was leasing 335,498 pieces of DP equipment at the end of fiscal year 1982. That figure includes 18,474 CPUs configured into 13,058 DP systems, 4,587 of which were "general management" systems (comprising 7,066 mainframes), as opposed to "special management" systems, defined as those used for classified purposes, for process control on board ships and planes.

(Continued on Page 78)

From 1980 to 1981, Study Says

Software, Services Sales Fall 8%

Company	Compound Annual Growth	Avg. Profit Margin	Classification
Comserv Corp.	54.7%	15.6%	SW
Auto-Trol Technology Corp.	41.2%	17.4%	TK
SEI Corp.	40.1%	25.6%	RAT
American Management Systems, Inc.	32.7%	6.3%	M
Applied Data Research, Inc.	32.6%	10.4%	SW
Computer Data Systems, Inc.	30.0%	7.3%	M
Electronic Data Systems, Corp.	29.0%	13.5%	M
Reynolds & Reynolds Co.	23.5%	41.2%	RAT
Automatic Data Processing, Inc.	23.3%	18.0%	B
Dataline, Inc.	19.0%	3.4%	B
Data Architects, Inc.	18.1%	0.7%	PS
Bradford National Corp.	11.5	19.3%	RAT
Computer Usage Co.	5.5%	3.9%	RPS

IDC Chart

Four-year growth and average profitability of software and services vendors. (Key: SW, packaged software; B, batch; RAT, remote automated transaction; RPS, remote problem solving; TK, turnkey; PS, professional services; M, mixed).

By Paul Gillin
CW Staff

FRAMINGHAM, Mass. — Recession has struck the software and services segment of the computer industry, according to the 1982 version of the biannual "Keys to Profitability in the Computer Software and Services Markets," published by International Data Corp. (IDC).

In a profitability overview of 53 companies in the software, processing and professional services fields, the study found that revenues of U.S. vendors surveyed increased 16% in 1981 over 1980 — an eight-point decline from the 24% increase achieved from 1979 to 1980.

The survey analyzed public companies with services and/or software revenues exceeding $2 million and includes profitability data through Jan. 31. Companies that operate in other areas and do not break out software and service figures are

(Continued on Page 74)

Wang Promotes Top Managers

By Bill Laberis
CW Staff

LOWELL, Mass. — In a move that one observer said "signals a reorientation to the marketing side," Wang Laboratories, Inc. last week announced a series of promotions affecting top management.

John F. Cunningham, formerly executive vice-president, was promoted to president and chief operating officer. Cunningham succeeds Dr. An Wang, company founder, as president. An Wang will remain as chairman of the board and chief executive officer.

Harry H.S. Chou, formerly executive vice-president, was promoted to vice-chairman of the board and will retain re-

(Continued on Page 80)

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Software and Services Sales Struck by Recession: Study

(Continued from Page 73)

not included.

The average profit margins of the 35 companies included in both the 1980 and 1982 versions of the study increased slightly from 11.2% to 12%. However, the averages were skewed by strong performances from large companies, the study said. Two-thirds of the vendors surveyed actually recorded a decrease in profit margins during that period.

The best profit margin performances were turned in by companies specializing in remote automated transaction and packaged software services, the study revealed. These companies recorded average margins of 17.9% and 16.2%, respectively. Batch service bureaus were also strong.

In breaking down profitability by company characteristics, the study found that high profits were reported by companies with revenues of greater than $50 million; they averaged 13.6%. Companies that sell internationally reported an average 13.2% profitability, 3.5% higher than those that sell domestically. An average profitability of 18.4% was reported by firms that are growing at a rate of 15% to 30% per year. This figure is nearly four points higher than that of firms growing at an annual rate of more than 40%.

The worst profit margin performances were reported by companies offering mixed and professional services, the study noted. The steepest decline was for companies specializing in remote problem-solving services — from 13.8% profitability in 1980 to 9.8% in 1981.

Highest Profits

Companies turning in the highest profitability figures for the 1982 study include Reynolds & Reynolds Co. (32.1%); NCA Corp. (26.4%); Shared Medical Systems Corp. (25.3%); Software AG International, Inc. (24.6%); Quotron Systems, Inc. (23.9%); Cullinane Database Systems, Inc. (22%); and Bradford National Corp. (21.5%). Four of those offer primarily remote automated transaction services.

The lowest profitability figures for established companies included Computer Network Corp. and Computer Usage Corp. (0% or a loss); American Management Systems (.2%); Mathematical Applications Group, Inc. (3.3%); Rand Information Systems, Inc. (3.9%); and Keane, Inc. (4.0%).

IDC predicted a compound growth rate of 36% per year for utility and application software packages through 1986. Growth in processing services is slower.

The study costs $595 from IDC at Five Speen St., Framingham, Mass. 01701.

Memorex Buys Into DMA

Memorex, a subsidiary of Burroughs Corp., has inked a joint sponsorship with DMA Systems Corp. under which Memorex will acquire a $1.5 million minority interest in DMA. Both DMA and Memorex are developing several models of high-capacity, high-performance fixed disk drives.

The agreement, Memorex announced, reflects the complementary nature of the products of the two companies and their compatible strategies of providing fixed 5¼-in. disk drives of business system quality.

The companies will now jointly sponsor DMA's development of enhanced versions of both fixed and removable disk drives using a removable rigid disk cartridge.

Memorex announced it intends to market immediately the current DMA Micro-Magnum product line.

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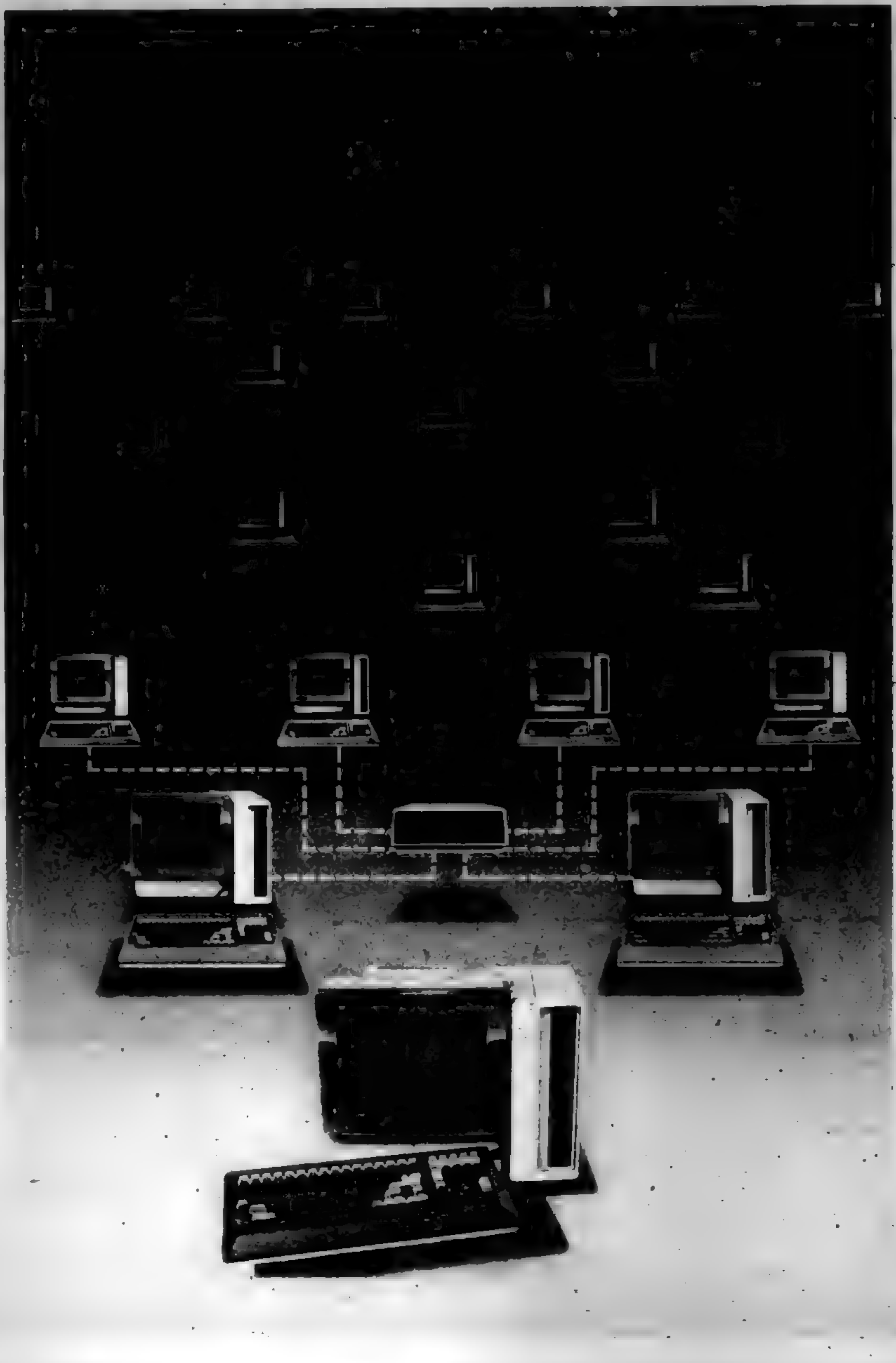

Awarded $11,000 in Counterclaim

DG Guilty of Fraud, Must Pay $86,000 to OEM

By Jim Bartimo
CW Staff

CHICAGO — Data General Corp. was found guilty of fraud, deceptive trade practices and breach of warranty this month and was ordered to pay the the heads of an OEM company $86,000 in damages.

And in a breach of warranty counterclaim against In-Flight Data Center, the U.S. District Court of Illinois here awarded DG $11,000 for computer payments not made by the OEM.

According to briefs filed, In-Flight Data, the OEM, had ordered a DG CS-30 minicomputer in late 1979 to develop software intended for sale with its turnkey packages.

CS-30 Offered

The then newly announced CS-30 was offered to authorized OEMs, which In-Flight Data had become in 1979, the legal complaint stated.

But problems arose for In-Flight Data when the system, said by DG to be a multitasking machine, could only be used by one programmer at a time, the complaint stated. Further problems arose when In-Flight Data found that certain software commands were lacking and that software written on In-Flight's CS-30 would not run on two of its customer's CS-30s, the complaint said. The customers each paid In-Flight for the machine, but not for the software.

Service Contract

According to the complaint, the plaintiffs and In-Flight owners, Mary Joan Wickham and William C. Wickham, said they signed a service contract with DG in 1980, but that DG never signed the agreement, even though the company cashed In-Flight's contract check. DG was unable to correct permanently the problems with the machine, the complaint stated.

In addition to compatibility problems with its customers' machines, In-Flight claimed it also experienced further problems with its own CS-30, used for programming. "[The] plaintiffs computer had a defective disk drive frame," the complaint said.

"The drive is contained in a drawer that pulls out of the computer cabinet," the complaint continued. "The drive would work when the drawer was pulled out, but when the drawer was closed, it would go off the track. [Data General] advised the plaintiffs to operate the computer with the drawer open."

Heavy Damages

"As a result . . . the plaintiffs suffered heavy damages [and] lost all of their customers and all of the time and money they had put into their business," the complaint stated. In-Flight Data's CS-30 was repossesed and resold.

Regarding the case, a DG spokesman said, "It is not our policy to comment on pending litigation. However, Data General is moving for a judgment notwithstanding the verdict and a new trial."

According to Marvin Benn, attorney for In-Flight, the court heard DG's plea recently and will act upon it within 30 days. At the same time, the plaintiff's moved to be compensated by DG for legal fees totalling $30,000 to $40,000, Benn said.

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Plessey, Scientific-Atlanta Enter Joint Venture

By Robert Batt
CW West Coast Bureau

LONDON — Plessey Co., a major British electronics manufacturer, and Scientific-Atlanta, Inc., have agreed on a joint venture for exploiting the rapidly growing international markets in telecommunications and satellites.

In a series of agreements announced by both companies, a joint venture company, Plessey Scientific-Atlanta Ltd., will be set up to exploit developing business opportunities for satellite markets in Western Europe.

Technical Assistance

In addition, Plessey plans to buy up to 30% of the U.S. company's common stock, while giving Scientific Atlanta technical assistance in the design and application of components, devices and products, according to the announcements.

The new joint venture, which will be owned 51% by Plessey and 49% by Scientific-Atlanta, also plans to develop new communications products including products for use in switched "star" coaxial cable or optical fiber communications systems. Scientific Atlanta will have an exclusive license to manufacture and sell products developed by the new company.

The two companies will have complementary strengths, according to the electronics manufacturers, with Scientific-Atlanta specializing in satellite ground station equipment, while Plessey is known for its expertise in digital telecommunications systems, fiber-optic transmission and network design.

Under a separate agreement, Scientific-Atlanta will have access to Plessey's research, development and manufacturing of customized, very large-scale integrated chips for use in its own products, the two electronics manufacturers reported.

Chip Maker To Buy DTS

(Continued from Page 73)

was having an increasingly difficult time keeping up with the POS industry leaders, such as NCR Corp. and IBM.

To the company's credit, Myher said DTS has a well-established nationwide distribution system, one that will give National Semi "strong access to several POS market segments."

It was the reported quest by Olivetti Corp. for a broad-based U.S. distribution network that led some industry observers recently to speculate that Olivetti, not National Semi, was DTS' suitor-in-waiting. Olivetti had bought 12% of DTS in 1981.

Myher also said that the acquisition, coupled with Datachecker, National Semi's major POS offering, will give the company "blanket [POS] market coverage."

The acquisition could also allow National Semi to utilize the overall systems offerings of its subsidiary, National Advanced Systems, Inc., to market a broader range of IBM-compatible, complete POS systems, from terminals to CPUs and storage subsystems, one analyst noted.

The acquisition agreement, unanimously approved by the boards of both companies, provides for a two-step transaction, according to a statement released jointly by the two companies.

First Step

The first step will be a cash tender offer of $8 per share for about $4.3 million shares of DTS, about two-thirds of the outstanding issues.

This tender offer is contingent upon, among other things, a minimum of 2.7 million shares being tendered and not withdrawn.

After the tender offer, the second step will be a cash merger transaction in which all shares not acquired by National Semi will be converted into the right to receive $7.25 per share in cash.

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* "Competitive Product Analysis of Decision Support Systems"
Research & Planning Inc., Cambridge, Mass.

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Commodore to Use Z8000 Family in Its Micros

CAMPBELL, Calif. — Zilog, Inc., a subsidiary of Exxon Corp., and Commodore International Ltd. have signed a definitive agreement under which Commodore will use Zilog's 16-bit Z8000 family of microprocessors for its next generation of microcomputer systems. Commodore had previously used processor chips of its own design and manufacture exclusively.

According to the agreement, Commodore will be licensed by Zilog to manufacture the Z8000 and related peripheral support circuits for use in its microcomputers. Zilog in return will receive from Commodore mask sets and manufacturing rights to selected custom circuits used in current and future Commodore products.

For users, the agreement could mean that Commodore will be among the first vendors to introduce low-cost 16-bit micros to the marketplace. According to Franc deWeeger, Zilog president, the agreement represents "an important step forward in the 16-bit microprocessor race. Previous 16-bit selections have been [designed] for relatively high-priced professional and business systems with moderate production runs."

Zilog had previously marketed its Z8000 for use in one other microcomputer, a high-end model from Olivetti Corp. Commodore's use of the chip will be its first appearance in the low-end market. Most 16-bit personal computers make use of either the 8086/8088 microprocessor from Intel Corp., such as the IBM Personal Computer, or the MC68000 manufactured by Motorola, Inc.

Large-scale integration circuitry for Commodore's computers now will be manufactured in part at Zilog's facilities, freeing up space for Commodore to more vigorously pursue its semiconductor manufacture. Commodore had previously announced a semiconductor manufacture expansion plan, which will double the company's chip capacity.

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Programmer Analyst

"It takes half the time to develop a model in System W because it requires you to do so much less logic and report writing than other languages. I was amazed that I was able to do one report specification with just twelve lines of rules. In another language the same report took several pages of code. System W's English language nature makes it so much easier to use that it's inherently faster."

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Study Looks At Supermini

WELLESLEY, Mass. — Shipments of superminicomputers will grow at a compounded annual rate of 31.9% through 1986, reaching total sales of $4.8 billion by that time, according to a report by Venture Development Corp.

"The Superminicomputer Industry 1981-1986: A Strategic Analysis" claims this rapid growth will be stimulated by the entry of "many new vendors" into the supermini market. The report says "any minicomputer or microcomputer vendor is a potential supermini competitor."

The report states that the six existing vendors of 32-bit superminis will expand their product offerings up and down the performance spectrum, and that expansion will be accompanied by rapidly falling hardware prices.

The new supermini introductions may incorporate 32-bit microprocessors and "will prove quite popular, from laboratory instrumentation and data acquisition application to small business computers," the report said.

"The Superminicomputer Industry 1981-1986" is priced at $2,490 from Venture Development Corp., 1 Washington St., Wellesley, Mass. 02181.

FAI to Open Plant in U.S.

NEW YORK — Fujitsu America, Inc. (FAI) will establish a U.S. manufacturing plant to produce optical fiber communications systems, according to Rinzo Iwai, company president.

FAI, a wholly owned subsidiary of Fujitsu Ltd. of Japan, said it will locate the plant in the so-called Sun Belt region of the Southwest.

Currently FAI has two other U.S.-based production facilities, American Telecom, Inc. and Fujitsu Microelectronics, Inc.

U.S. Gained $270 Million Worth of CPUs in '82

Manufacturer	Total Number of Components	Value of Components (Millions)	Number of CPUs	Total Percent of CPUs (Fiscal Year 1982)	Total Percent of CPUs (Fiscal Year 1981)	Value of CPUs (Millions)	Number of I/O Devices	Value of I/O Devices (Millions)	Number of Storage Units	Value of Storage Units	Number of Communications Terminals	Value of Communications Terminals (Millions)
Control Data Corp.	28,897	713	428	2.3	2.5	355	5,442	88	6,379	225	9,513	32
Data General Corp.	4,968	59	1,292	7.0	7.4	39	1,555	5.4	1,265	11	508	2
Digital Equipment Corp.	26,809	388	4,924	26.7	26.2	233	7,000	36	8,052	90	5,134	22
Honeywell, Inc.	34,570	639	1,083	5.9	5.2	240	6,413	97	7,181	218	18,361	60
Hewlett-Packard Co.	11,629	102	1,740	9.4	8.7	47	4,191	17	1,844	17	2,932	15
IBM	53,746	1,337	1,367	7.4	8.2	513	10,341	278	7,406	364	5,224	64
Modular Computer Systems, Inc.	2,829	60	840	4.5	5.5	65	805	3.6	873	9	170	1
Perkin-Elmer Corp.	2,175	35	411	2.2	2.2	27	427	1.4	742	6	520	2
Sperry Univac	25,943	681	1,626	8.8	9.6	224	6,866	98.4	6,864	269	6,130	58
Wang Laboratories, Inc.	4,642	54	476	2.2	2.2	9	2,044	29.1	746	8	881	9
Other	144,290	1,723	4,287	23.2	22.5	408	38,244	314	23,297	551	62,583	279
Totals	335,427	5,809	18,474	100	100	2,158	83,328	965.9	64,649	1,768	111,956	543

GSA Chart

Federal DP Inventory as of Sept. 30, 1982

(Continued from Page 73)

Continuing a trend toward increased use of small computers, the government added 683 machines (from 12,000 CPUs to 12,683) costing less than $50,000 during fiscal year 1982, 268 CPUs (from 3,797 to 4,065) costing between $50,000 and $200,000 and only added 20 mainframes with price tags exceeding $200,000 (1,706 to 1,726) to the 17,503 CPUs in the inventory at the end of fiscal year 1981.

Of the 18,474 federal CPUs, 16,768 were owned and 1,707 leased. Of the 14,940 new DP systems components acquired during the last fiscal year, 7,438 were bought for $117 million and 7,502 (valued at $148 million) were leased. Some 530 of the new federal mainframes were purchased for $53 million and 143 (valued at $49 million) were leased. Demonstrating a continued problem with aging systems, 2,065 of the machines were older than 12 years at the end of last September.

As in the previous year, Digital Equipment Corp. had delivered the largest number of CPUs to federal agencies, accounting for 26.7% (4,924 machines) of the overall CPU total. IBM, which controlled more than 42% of the federal market in 1965, saw its share continue to drop, from 8.2% to 7.4%, although the firm maintained the lead in dollar value of total federal components, $1.337 billion. In general, there were no drastic swings in the statistics for individual suppliers of mainframes; Hewlett-Packard Co. climbed from 8.7% to 9.4%, Sperry Univac dropped from 9.6% to 8.8% and the rest maintained their representation, at least in terms of numbers of CPUs.

In terms of end users, the Department of Defense remained the primary computer user in the government, accounting for 5,589 systems, comprised of 7,519 mainframes. Individual figures here at the end of fiscal year 1982 were: Air Force, 1,966 systems (2,906 CPUs); Navy, 1,799 systems (2,270 CPUs); and Army, 1,554 systems (1,899 CPUs).

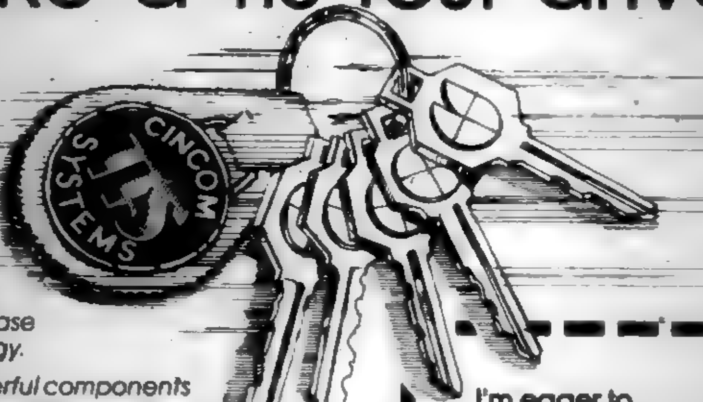
Major civilian agency computer users included: Energy Department, 3,450 systems (4,530 CPUs); Veterans Administration, 652 systems (731 CPUs); and the Commerce Department, 464 systems (444 CPUs).

ACT Sells Services Subsidiary

NEW YORK — Advanced Computer Techniques Corp. (ACT) has sold its former subsidiary, ACT Computer Services, Ltd., to a company formed by a group of ACT, Ltd. employees in Canada for $4.5 million. The company said $1 million will be paid in cash, with the remainder paid as fees for services and licenses over a four-year period.

The divestiture fulfills ACT's commitment to the Canadian government's Foreign Investment Review Agency, which required the sale of at least 60% of the equity of ACT, Ltd. to Canadian investors. The firm also said the divestiture is a continuation of company efforts to move to serving specific vertical markets.

ACT Corp. is headquartered at 437 Madison Ave., New York, N.Y. 10022.



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To Consolidate Activities

HP Establishes Personal Computer Group

PALO ALTO, Calif. — In a move designed to consolidate personal computer activities, Hewlett-Packard Co. has formed the Personal Computer Group, responsible for all personal computer and workstation-related manufacturing. The new group consists of the company's former Personal Computation and Computer Terminals groups.

Cyril J. Yansouni, former general manager of the Terminals Group, has been tapped to head the Personal Computer Group, which will be based in Sunnyvale, Calif. Meanwhile, C. Richard Moore, former general manager of the Personal Computation Group, will be assigned to define a broad strategy for HP products aimed at the engineering productivity marketplace, the company announced.

Included under the aegis of the new group are HP's Series 100 personal office computers, Series 80 personal computers for business and engineering use, Series 70 portable computers, Series 40 hand-held computers and Series 10 programmable calculators, as well as peripherals associated with these products.

Sales of personal computers and peripherals for HP in 1982 totaled about $500 million of the company's $4.25 billion in gross revenues.

Prime Signs Joint Marketing Pacts With ISI, Henco, Real Decisions

NATICK, Mass. — Prime Computer, Inc. has extended its third-party applications software offerings with three joint marketing agreements relating to key software packages for payroll/personnel, text management/document retrieval and decision support, which will now be available to the company's customers and prospects.

Integral Systems, Inc. (ISI) of Walnut Creek, Calif., will now offer Prime users on-line, real-time updates to an integrated data base with its payroll/personel system. ISI's system reportedly handles a range of human resource management functions in a variety of modules and options ranging in price from $35,000 to $100,000.

Henco Software, Inc. of Waltham, Mass., will make available to Prime users its text management/document retrieval system, said to extend the capabilities of the company's relational data base management product to the organization and retrieval of unlimited-length text. Info-Text is priced at about $20,000.

Real Decisions Corp. of Stamford, Conn., will make available its Dart modularized data access and reporting system for in-house processing of Standard & Poor's Compustat data bases. Dart is said to access bank, utility, telecommunications, and business information files contained in Compustat and is priced at $15,000 for the entry-level module.

Prime also announced its first joint marketing agreement for the DCS-2 system of Teltone Corp., said to enable simultaneous voice and data communications to be transmitted over existing phone lines in local-area networks. Under the joint agreement, Prime sales representatives will introduce a jointly marketed product to company customers, with the companion marketer responsible for the direct sale and support of its product.

In another announcement, Prime said it has formed a separate profit center responsible for computer-aided design and manufacturing (CAD/CAM) products. John K. Buckner, vice-president of Prime, was appointed president of the CAD/CAM Business Group, which will direct the company's worldwide business in scientific, engineering and manufacturing concerns.

Nickels & Dimes

Distribution Management Systems, Inc., Lexington, Mass., has received $2.2 million in financing from a group of investors including The Palmer Organization L.P., Fidelity Ventures, Ltd.; Funds for Industry, U.K.; Rhode Island Hospital Trust Capital Corp.; New England Capital Corp.; Massachusetts Institute of Technology, and Investors Associates.

$ $ $

Micro Peripherals, Inc. has obtained a $15 million line of credit from Union Bank, a subsidiary of Standard Chartered Bank Group, London.

$ $ $

Eagle Computer, Inc., San Jose, Calif., has received a $5 million line of credit from the Bank of America.

Mountain Computer, Inc. has received a total of $500,000 in funding from San Jose Capital Corp. and PCF Venture Capital Corp., Burlingame, Calif.

$ $ $

Amnet, Inc. has received a total of $3.4 million in venture capital funding. Investors include Hambrecht & Quist, San Francisco, The Palmer Corp., Boston; Citicorp Venture Capital Ltd., New York; Alex. Brown & Sons, Baltimore; Scientific Advances, Columbus, Ohio; and Canadian Enterprises Development Corp., Ltd., Toronto.

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Mergers and Acquisitions

Utility Marketing and Development, Inc., Tampa, Fla., has reached agreement with **United Technologies-Lexar Corp.** to acquire Lexar's (formerly Stromberg-Carlson's) Crossreed private branch switching equipment product lines and its associated support services.

Scientific-Atlanta, Inc., Atlanta, has completed its acquisition of the assets and business of **Digital Video Systems, Inc.**, Toronto, Canada.

Avnet, Inc., New York, has acquired **Inter Circuits, Inc.** of Stockton, Calif., for $6.5 million, payable in Avnet common shares.

Honeywell, Inc. and **Finnegan Corp.** have completed a transaction whereby Honeywell has purchased Disc Instruments, Inc., maker of optical encoders used in computer peripherals and factory automation equipment.

Sensormatic Electronics Corp., Deerfield Beach, Fla., will acquire **MSI Data Corp.**, Costa Mesa, Calif., for approximately $100 million through the exchange of a nine-tenths share of Sensormatic common stock for each common share of MSI.

Prime Computer, Inc. will acquire **Compeda, Ltd.**, a British developer and distributor of computer-aided design and manufacturing software, for an undisclosed amount of cash.

International Telephone and Telegraph Corp. has completed the acquisition of **Dialcom International, Inc.**, Silver Springs, Md., with Dialcom becoming a member of ITT's Communications Operations and Information Services Group. Terms of the agreement were not disclosed.

Cunningham Promoted To President at Wang Labs

(Continued from Page 73)

sponsibilities as chief financial officer and treasurer; and Frederick A. Wang, Dr. Wang's son and formerly senior vice-president, was promoted to executive vice-president and chief development officer. Cunningham, Frederick Wang and Chou will each report directly to Dr. Wang.

In addition, company directors promoted Jon F. Kropper from senior vice-president to executive vice-president of manufacturing. Kropper will report directly to Cunningham.

Despite Cunningham's elevation to president, Frederick Wang is not now the dark horse in the race to succeed his father as chief executive officer, analysts said. Rather, the promotions may have the effect of delaying, for the time being anyway, any corporate wrangling over who might eventually succeed Dr. Wang as head of the rapidly growing office systems maker.

Since Wang's annual revenues cracked the $1 billion mark last year, there has been increasing speculation that Dr. Wang would yield large chunks of his de facto authority to his hand-picked management team. Some observers speculate that perhaps no one will ever wield the power Dr. Wang now holds and that the company might eventually divide that power up "to bend to the will of Wang's top people to keep them on board," one analyst said.

George Colony, an analyst with The Yankee Group, said Cunningham's appointment as president coincides with company efforts to vault itself into the '80s via a powerful marketing effort as an office automation and small systems leader "and not as a second-rate company." Cunningham's strategic planning expertise will be needed to help the company match "the very powerful sales forces of the IBM's and [Digital Equipment Corp.'s] and [Hewlett-Packard Co.'s]," Colony said.

Ascendancy Not Assured

"Fred Wang's ascendancy is going to be delayed, but is not assured," Colony said. As Wang has long been a development and innovation-oriented company, Frederick Wang's performance as chief development officer will determine whether he actually succeeds his father, Colony added.

"Fred is far from out of this race," Colony remarked. "In the meantime, it is very important that Dr. Wang stay on to keep the company's inertia going into what will be a very important transition period in 1983. Now he [Dr. Wang] will see who can cut the mustard."

David Terrie, office automation analyst with International Data Corp., said, "It seems with these promotions that the company's just playing it cagey, splitting up the power along lines already defined. Fred [Wang] will remain the head of product development and technology and Cunningham will continue in strategic corporate planning. It doesn't sound as though anyone's ambition has been derailed."

Either Cunningham or Wang is expected to succeed Dr. Wang.

Hardware Makers Form NS16000 Users Group

By Jeffry Beeler
CW West Coast Bureau

SAN JOSE, Calif. — Among buyers of microprocessors and other semiconductor components, users groups have been virtually unheard of — at the least, highly unusual.

Now the situation may begin to change. Last month, representatives of 17 hardware manufacturers gathered here for the first ad hoc meeting of an emerging users group whose main focal point is the National Semiconductor Corp. NS16000 microprocessor.

The group boasts the distinction of being perhaps the first collection of hardware buyers to devote itself exclusively to a semiconductor part as opposed to a system-level product, according to Tom Linden, the organization's president pro tem.

Unlike most other such groups, the NS16000 organization consists mostly of vendors that buy raw microprocessors from National Semi, build the devices into their own products and then sell the finished goods on the open market. The group's membership includes no computing professionals or other end users, in sharp contrast to more familiar customer associations like IBM's Guide and Share.

Still in its embryonic stages, the group owes its existence mainly to Linden, who serves as president of an Allston, Mass.-based compiler and software company known as Translation Systems, Inc.

Linden, who spearheaded the group's formation, sees the organization as an effective means of dispelling what he feels is widespread misinformation about the NS16000. Many of the part's users and prospective users are laboring under the mistaken impression that the NS16000 fails to work as it was intended, he said.

Users are also widely misinformed about the microprocessor's delivery dates, the nature of its functions and its methods of operation, he said, a fact Linden partly attributes to National Semi's purported failure to market the product effectively.

"With any new part like the NS16000, there's always a genuine need for a free exchange of information among technical users," Linden said.

Another of the users group's primary purposes is to apply pressure on National Semi to adopt product, marketing and support plans favorable to the membership's interests.

Linden also expects the group to form a technical advisory committee that will aim to influence the semiconductor vendor's ongoing NS16000 development efforts and to suggest possible ways of improving the component's performance.

Executive Corner

- Vaemond H. Crane has been appointed president and chief operating officer for Computer Consoles, Inc. Herman A. Affel Jr. was named chairman of the board and chief executive officer for the firm.
- Gerald W. Fleming has resigned as Microdata Corp.'s senior vice-president for marketing, sales and service to become president and chief operating officer at Rexon Business Machines Corp. Ben C. Wang will continue as chairman of the board and chief executive officer at Rexon. Wang is also president of the newly formed Rexon subsidiary, Wangco.
- Deanna Driscoll has been elected vice-president of software development at Unidata Systems, Inc.
- Channing H. Russell has been appointed divisional vice-president, Computer Systems Division, at Bolt Beranek and Newman, Inc.
- Frank Faggiano has been promoted to vice-president of human services at Prime Computer, Inc.
- Joseph C. Ciasullo has been elected executive vice-president, international operations, at Datapoint Corp.
- Wayne Sharkey has been appointed corporate vice-president, sales and marketing, at Semtronics Corp.
- David M. Turpin has been named vice-president of manufacturing at Dialogic Systems Corp.

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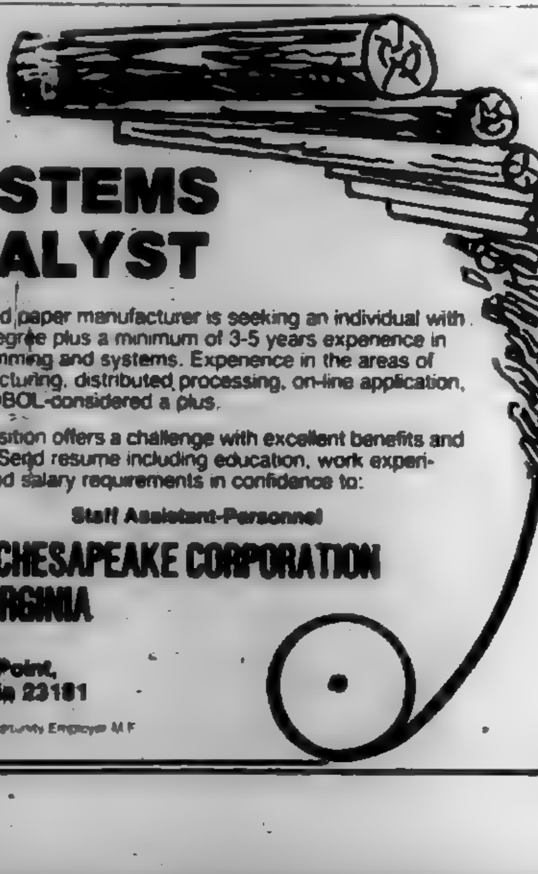

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NU COMP Systems, Inc. is a leading software development company providing the banking and financial community with application support in an IBM System 34/38 environment. Our primary product is the System 34 Banking System. This proprietary software package integrates CIF, DDA, SAVINGS-CD's, ILA, MLA, CLA and G/L enabling bankers to achieve in-house control over their own data processing and thereby have immediate access to information necessary for responsible decision-making.

We are experiencing rapid growth and need to add professionals to our staff to install, maintain, provide telephone support, and develop our state-of-the-art banking systems. We have outstanding opportunities for individuals seeking work in a challenging, stimulating environment where individual initiative is rewarded.

We are interested in talking with you about career opportunities within NU COMP if your data processing credentials include:

3 - years of S/34 banking experience with RPGII
OR
4 - years of computer banking experience
OR
4 - years of S/34 RPGII

If you fully satisfy these prerequisites, please submit in complete confidence, a resume which details your experience, education, salary history, and major accomplishments.

NU COMP SYSTEMS, INC.
Suite 100
Liberty State Bank Building
1573 Selby Avenue
St. Paul, Minnesota 55104
ATTN: John Williams

GOOD THINGS HAPPEN ON THE CHESAPEAKE BAY

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We built our success on a history of quality service.

- Development of complex online DBMS applications.
- Innovative use of powerful minicomputer technology.
- Design of large-scale distributed systems.

DATABASE ADMINISTRATION

- UNIVAC DMS-1100
- User Data Base Requirements
- Logical Data Modelling
- Data Base Design

MINI-COMPUTER SYSTEMS SUPPORT

- TANDEM Non-stop Systems
- Operating System Support
- Data Base Development
- Networking

If you would like to be on board in time for our next success, call 'Susan' COLLECT at (301)468-2500 EXT. 330 and send resumes to:

DYNAMAC CORPORATION
PAX PROJECT
c/o Personnel Dept.
11140 Rockville Pike
Rockville, MD 20852

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SENIOR PROGRAMMER ANALYSTS

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Jefferson Ward

invites qualified candidates to join our exciting team of MIS professionals. We offer high level development including online and distributed systems coupled with a dynamic environment including multi CPU, a national network, MVS, TSO, CICS and point of sale.

Qualified candidates will have:

- 5 years programming experience including CICS command level.
- Retail financial or POS experience a plus.

We offer excellent benefits and upward mobility in our young growing Data Processing organization. For immediate consideration, send resume to ***JEFFERSON WARD, 15800 N.W. 15th Avenue, Miami, Florida 33169, Attention Recruiting.***

PROGRAMMER ANALYST

PL/1 PROGRAMMER

PL/1 Programmer to work on Data Base systems; opportunity to enhance and learn IMS, CMS, Mark IV, VSAM, and On Line Systems. Requirements: 2 years IBM 370, JCL, PL/1. Environment: IBM 3081, VM/CMS, OS/SVS (moving to MVS), IMS DB, CICS DC. Full benefits including 24 paid vacation days, life insurance, medical and pension plans and more.

Send resume with salary history to: JOAN DOIG, PRINCETON UNIVERSITY, PERSONNEL, CLIO HALL-I, PRINCETON, NEW JERSEY, 08544

Equal Opportunity/Affirmative Action Employer

DP Management/Non-Management
Application Design/Support/Consulting
Systems Programming

We're American Bell. We're operational. And we're now staffing two new DP facilities in Orlando and Denver.

American Bell is open for business, and we're moving fast. We need to identify top caliber DP professionals for each of these new facilities. These openings represent exciting, high visibility, high potential opportunities.

In Orlando…

We have a large-scale, state-of-the-art facility that is already operational. The facility concentrates on providing expert systems programming and application design/support/consulting services. This multi-cpu environment encompasses:

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IBM 308X, IBM/Comten 3705, 3690 or equivalent front end processor

DBMS

CICS/VS, IMS/VS, Model 204, Ramis/Focus, DASD Management, ADABAS

LANGUAGES

COBOL, PL/1, Fortran, C, Shell Programming, UNIX*

NETWORKING ENVIRONMENTS

VTAM/NCP, VM/SP, TSO/SPF, VM/CMS, VSAM

We're looking for Systems Programmers and Application Design/Support Consulting Professionals with at least 3 years of experience in their field and some mix of expertise in the areas described.

In Denver…

Target date for start up is April 1st. There are high potential opportunities at both management and non-management levels for professionals qualified to contribute effectively to a large-scale, state-of-the-art facility. Our function …and yours … will be to provide high level hardware and software support to American Bell operations in the Western Region.

We seek top caliber DP professionals with some mix of experience in

MVS, IMS, CICS, JES, UNIX,* IBM 308X Compatible Peripherals

If you want to be considered for these really unique opportunities rush your resume to me: W. P. Kroll, District Manager, Dept. 101, American Bell, Inc. POB 13970, Orlando, FL 32859

If you qualify, you'll be contacted for a convenient local interview at an early date. (We regret that we cannot accept phone calls…or pay agency fees.)

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Take A Byte Of Our Internals

Are the challenges at yous current company leaving you unfulfilled? If so, maybe it's time you considered the NYC Department of Finance's OMIS office.

You're ideal for this position if you have strong hands-on experience in a dual CPU facility, preferably in an IBM 4300 environment under OS/VSI and VM/370 with CICS in a shared peripheral system. And since we're planning on expanding to a VTAM based system, your familiarity with VTAM is a definite plus as would be any exposure to ADABAS/DBMS. You must have a minimum of 6 years impressive DP experience, 2 of which should be at the management level, plus excellent communication skills, and the ability to interface effectively with all levels of management.

The wide-ranging responsibilities of this position include managing an in-house technical staff, evaluating hardware as well as systems/applications software, implementing and supervising various operating standards and procedures, as well as other related services in an area of systems performance: tuning, upgrade, and maintenance.

If you're ready to byte into these challenges, and then some, and you meet our qualifications, we'll offer you a salary commensurate with your experience, plus a comprehensive benefits package featuring a liberal vacation. Just send your resume, including salary history, in confidence, to:

N.Y.C. Department of Finance
Personnel Division
1 Centre Street, Rm: 1036
New York, New York 10007
Equal Opportunity Employer M/F

EDP OPPORTUNITIES

Comm Engr BSEE and dig voice data F V Sbs Acs Xten BSEE MSEE	$60M +
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CAPACITY Planning Software Hardware comm	$55M +
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SOFT VS1 CICS Vtam smp	$43M
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RAMIS Wall St incl client contact	$35M
S A Osc auto micro mini sys generalist with sm prior program exp	$32M
CICS OS MVS Cobol sys dev prestige corp state of the art	$31M + bonus
PROGRAMMER Fortran Basic incl sys data base	$29M
SYSTEM Analyst Micro mini dev	$25-33M
WALL ST Micro Mini incl sys dev	$25-33M
INSURANCE Fincl sys dev micro mini	$25-33M
JR PROG Lt CICS acctg sys dev	$23M +

Call Bill Sorrelli (212) 349-3610
WM. HARRIS ASSOC.
25 Ann Street agency NY, NY 10038

Systematics, Inc., America's Largest and Fastest Growing Full Service Bank Data Processing Company. We serve hundreds of bankers across the country with facilities management, application software packages, and remote processing services.

Because of our continued growth, we are currently recruiting for qualified professionals for the above noted locations. Our needs include programmer/analysts, systems analysts, programming managers, data center managers, technical liaisons, and corporate data processing personnel. Banking industry experience preferred.

For immediate consideration or more information, write:

Recruiting Department
Systematics, Inc.
4001 Rodney Parham Road
Little Rock, Arkansas 72212-2496

No agencies, please.

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**Currently, we're highlighting key opportunities in:
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for**

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with the following expertise:

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CICS COMM/or
MACRO
UNIX 'C'
MODEL 204 DATABASE
VTAM
SNA

IF YOU'RE NOT INTERESTED IN THE ABOVE LOCATIONS, WE WOULD STILL LIKE TO HEAR FROM YOU FOR OPPORTUNITIES IN OTHER REGIONS....

At Beamer Associates, we think it's time for DP Professionals to have the option of designing their own career programs. If you would like to be more flexible or just want to earn higher dollars, contact

**Lauren Dinario
Manager of Recruiting**

**800-223-2554
In N.Y State (212) 838-4441**

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**Suite 1500, Department 'B'
747 Third Avenue
New York, New York 10017**

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PROGRAMMER/ ANALYST

Develops automated systems in support of financial aid operations. Specific duties include designing, preparing and testing of programming, defining programming requirements, providing systems programming support to office Series/1 mini computer, maintenance of existing systems and preparation of documentation. Bachelor's degree or equivalent, preferably in Computer Science, four years programming experience, knowledge of COBOL, OS/VS JCL, Event Driven Language. Strong communication skills and a familiarity with statistical and report generation packages, and knowledge of 370 Assembler or S/1 Assembler are important qualifications. Salary is highly competitive and there is an excellent fringe benefit program. Send resume and salary requirements to:

NEW YORK UNIVERSITY

Office Of
Financial Aid
c/o Employment Office,
246 Greene Street
New York, New York 10003
Attn: Kim Miller

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CHICAGO

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Immediate openings for Systems Analysts with 5 + years data processing experience. Manufacturing and financial background desired. Must have on-line skills. Looking for professionals with new ideas. Excellent opportunity with rapid growth company

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SYSTEMS ANALYST. Design, analysis & implementation of programs, for systems conversion from manual procedures, rltd to financial insts. Investigation & enhancement of existing systems. Make test runs & corrections as necessary. B.Sc in Computer Science. Must have knowledge of COBOL, ASSEMBLER, JCL & CMS. 2 yrs or 2 yrs p programming. $33,000 p.a. to work 37½ hrs/5 days/wk. **PLEASE SEND RESUMES: CAP-CPP Service, Inc. 521 Fifth Ave. NYC 10175**

FIELD ENGINEERS

Hartford Technical Services is seeking Senior Level 303X, 370, and 4300 X-IBM FE's with openings in Chicago, L.A., Houston, Detroit and Ohio. H.T.S. is a maintenance company that offers substantial savings and service to its maintenance customers. Salary and benefits commensurate with your expertise. If you are seeking a future and have these skills call:

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(312)364-0505
Hartford Technical Services, Inc.
515 East Gulf Rd.
Arlington Heights, IL 60005

COMPUTER SYSTEMS PROGRAMMER for employment in SAUDI ARABIA. Serves with a team of U.S. advisors to Saudi Arabian National Computer Center. Requires extensive experience using MVS operating systems on IBM 370 or 30XX computers. Must be capable of installing, testing, tuning, and evaluating computers, telecommunications systems, utility packages, compilers, software packages, peripheral equipment etc. U.S. Citizenship required. Family may accompany. Benefits include COLA, free quarters, free automobile, school allowance for dependent children, and much more.

Submit resume to: CONSULTANTS & DESIGNERS INC., 1725 Jefferson Davis Highway, Plaza Level, Arlington, VA. 22202. For more information, call toll-free (800) 368-3021. In Virginia, call (703) 521-2900.

COMPUTER PROGRAMMER TELECOMMUNICATIONS

The Dept. of Justice needs a COMTEN systems programmer to support their 3690s used for front-end processing and message switching. Applicants must have at least 2 years of experience with the internals of 3690 front-end processor software, COMTEN's EXEC90 and CTAM message switching system software, and also possess knowledge of the IBM access methods (BTAM, RTAM, VTAM, TCAM) used to support our user community with CMS, CICS, HASP and JES2. Other duties include problem diagnostics, hardware evaluation, acquisition planning and network design. Salary $29,374 - $34,930.
Send an SF 171 to Wm. T. Delerding, Dept. of Justice, Justice Management Division, Justice Computer Service, Rm. 4003, 425 I Street N.W., Washington, DC 20530. An EOE

GENERAL MANAGER

Division of stable, successful 59-year family-owned machinery affiliate group requires aggressive individual with technical expertise and managerial capability to manage its Computer Division. Experience with DEC 11/70 On-Line System (RSTS/E - TOTAL TAM - BASIC + 2) desirable. Highest compensation. Benefits include profit sharing

**SHEPHERD DATA SYSTEMS
Attn.: Bill Burke
P. O. Box 22122
Los Angeles, CA 90022
(213)723-7777 x406**

CITY OF DALLAS

Assistant Director, Data Base Administrator

Department of Data Services

Position available to select and administer a Data Base Management System (DBMS). Person will be responsible for collecting and organizing material for storage and retrieval from the DBMS. Monitoring data base usage; collecting statistics on utilization od data and programs, refining and expanding current Business Systems Planning effort, recommending revised programming standards, participating in budget review meetings, and supervising the City's office services division.

Salary range $41,992 - $52,945 depending on qualifications.

Successful applicant should have bachelors degree in business with a concentration in systems analysis or computer programming including data base concepts, design and administration plus five years related experience. Two years experience should be in ALC and/or a higher level programming language, and computer applications systems analysis and design. Experience in implementing a DBMS is highly deserved.

Interested persons should submit a detailed resume by Monday, January 31, 1983 to:

**Personnel Department
Staffing Manager
City Hall - 6AN
Dallas, Texas 75201**

Equal Opportunity Employer
m/f/h

SR. SYSTEMS ANALYST

We are a respected Midwest leader in energy-related research and manufacturing, a dynamic part of a Fortune 150 corporation. The Senior Systems Analyst we seek will work directly with management and user department personnel in providing wide-ranging MIS support.

Initial assignment will be to implement a new general ledger and project accounting system. Future challenges will involve feasibility studies, systems analysis/design and the implementation/testing on a variety of business systems applications for both new and enhanced systems.

The ideal candidate should have an MBA and at least 6-8 years related experience in planning, development and implementation of business information systems. Familiarity with data base technology would he highly desirable.

We offer a competitive salary, excellent benefits, outstanding advancement potential and the relaxed living environment of a pleasant midwestern city. Please send resume with salary history and requirements, in confidence, to:

Box CW 806
810 Seventh Avenue, New York, N.Y. 10019
An Equal Opportunity Employer M/F/H/V

PROGRAMMER ANALYST

Downtown L.A. area firm has issued an "ALL POINTS BULLETIN" in search of a PROGRAMMER ANALYST with 3-5 years experience.

The successful candidate will have experience working with BASIC PLUS and DEC/RSTS systems in a business environment.

Interested and qualified candidates should send resume with qualifications and salary history to:

Cummins

**Cummins Sales & Service, Inc.
1800 E. 16th Street
Los Angeles, CA 90021
An Equal Opportunity Employer M/F**

DATA BASE SPECIALIST

**$35,300
(or commensurate with experience)**

The Office of Management Information Services has an immediate opening for an individual with a technical background in DBMS. Individual will be responsible for review of data base designs, monitoring performance, improving performance, assisting the Applications Staff in the use of DBMS, developing and enforcing DBMS standards and procedures, implementing and maintaining a data dictionary, and overall responsibility for security and access to the data base.

Qualifications must include extensive experience in the applications programming area as well as several years using DBMS. Thorough knowledge of DL/1 or IMS is preferred and experience in the DOS/VSE environment is required. Excellent benefits.

APPLY TO:

**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
600 Fifth Street, N.W.
Washington, DC 20001
Attn: Human Resources**

AN EQUAL OPPORTUNITY EMPLOYER

UNIVERSITY OF ALASKA

As a result of phasing out a facilities management contractor the University of Alaska has openings for management positions in the University of Alaska Computer Network (UNET). The UNET facility serves 14 campuses in 12 communities across the entire state of Alaska. Currently, major hardware and software acquisitions for both academic and administrative computing are in progress which will replace the dual Honeywell 66/40's now serving the user community. The opportunity to participate in a leadership role in a positive, constructive academic environment clearly exists.

Director of
Administrative Computing Services

The Director of Administrative Computing Services will be responsible for the development and/or enhancement of new administrative computer systems as well as maintenance and/or enhancement of current administrative computer systems. Based in Fairbanks, the director will supervise a staff of analyst/programmers to accomplish the above while maintaining documentation and programming standards.

The successful candidate will have considerable experience in the development of administrative computer systems as well as supervising experience.

CLOSING DATE: 2/7/83

Applications should be submitted to the following address:

Mr. William L. Clark
Ass't Vice President
for Computing Services
107 Bunnell
University of Alaska
Fairbanks, AK 99701

THE UNIVERSITY OF ALASKA
IS AN AA/EO EMPLOYER
AND EDUCATIONAL INSTITUTION.

Your application may be subject to public disclosure if you are a finalist for the position.

DATA PROCESSING

We currently have a job opportunity for an experienced Programmer Analyst. We require at least 4 years of active business experience as a Programmer and Systems Analyst. The successful candidate will have designed and implemented data base systems in the IMS, IDMS or similar DBMS environment. A degree in Computer Science will partially fulfill the experience requirements for this position.

Our Corporate Information Services Department is centrally located in an attractive, modern facility offering a comfortable working environment.

We offer an exceptional benefits package which includes medical, dental, vision, life, AD&D coverage, profit sharing, bonus and educational reimbursement.

Please direct your resume to: **J. Fred MacKissic, 2755 Campus Drive, San Mateo, CA 94403,** or call **(415) 574-3333.**

In Colorado, There's Room to Grow... Straight to the Top

Storage Technology Optical Disk is involved in the design, development, manufacturing, and marketing of Optical Data Recording products. Located at the base of the Rocky Mountains, our location offers a unique lifestyle with outstanding cultural and recreational opportunities minutes away in Boulder, Colorado. Expanding Research and Development efforts for our Optical Data Recording products has created the following opportunities:

• MVS SYSTEMS PROGRAMMER

You will be primarily responsible for system support and secondarily responsible for program development in a Test Engineering and Manufacturing environment. In this position you must know MVS/SP rel 1.3 and be capable of running SYS GEN in an IBM 4341-2. Additionally required is familiarity with JCL and JES21 as well as the capability to debug and resolve system problems. Knowledge of VM/SP, RSCS, and passthru is desirable. BSCS degree or equivalent and minimum of six years engineering experience is required.

• DATA BASE DESIGNER

You will [illegible]esponsible for the architecture and design of a DBMS to collect data from Unit and System Test for inquiry, reports and archiving. Knowledge of MVS/SP rel 1.3, UNIX, C, and Data Communication concepts are highly desirable. A BSCS or equivalent and a minimum of six years engineering experience is required.

• TEST SYSTEM PROGRAMMER

You will be a member of a Test Equipment design team writing Software to control diagnostic software testing, create test automation facilities, and data base software. You must have a solid working knowledge of UNIX and C. Knowledge of MVS/SP rel 1.3 is desirable. BSCS or equivalent and minimum of four years engineering experience is required.

Storage Technology offers an excellent benefits package including relocation, health, dental and life insurance, stock purchase plan and much more. For immediate consideration please send your resume to Mr. Dan O'Reilly, Dept. 124, MDFF, #51, 2270 S. 88th St., Louisville, CO 80028.

Equal Opportunity Employer

Storage Technology

DATA BASE ADMINISTRATOR

A progressive electric utility is seeking a self-motivated individual for the position of Data Base Administrator. The ideal candidate should have a degree in Computer Science with 5 years related experience. Current system is an IBM 370/158, OS/VS1 with IMS DB/DC. Hardware and software being up-graded in the coming year. Salary expected in the low 30's.

Successful applicant will find a relaxed way of life, excellent working conditions, year 'round outdoor recreation, a safe place to raise a family, and exposure to the delightful atmosphere and cultural pleasures of historic Charleston. We are one of the fastest growing electric utilities in the nation, and excellent growth opportunities are available.

Send resume and salary requirements in confidence to:

Wm. Glen Brown
Employment Supervisor
Santee Cooper
P.O. Box 398
Moncks Corner, S.C. 29461
803/899-2121

An Equal Opportunity Employer

Santee Cooper

We are looking for Consultants and/or Engineering Companies as **Licensees for Computerized Maintenance Planning and Control System.** The system covers the planning and control of periodic inspections and will record defects, indicate weak components, and control the work load in maintenance departments. The system will also be involved in job preparation and work control, control of maintenance stores, budgetting and control of maintenance cost and output control in maintenance departments. Licensee will be supplied with all aides, sales support and the name "Grothus", known world-wide for successful and practical solutions in plant maintenance. Arrange for a meeting in Chicago in March 1983 through **Grothus, Institut fur Anlagentechnik, Wettring 4, D-4270 Dorsten 21, West Germany.**

DP MANAGER EDUCATIONAL INST.

A true manager's position for the experienced supervisory pro. Solid background in COBOL programming is required & a knowledge of PL/1 helpful. Small shop exposure preferred. Have mini system currently. Supervise staff & become involved with system dev & implementation. Sound opportunity $40,000.

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Houston — Phoenix — Sacramento — Tulsa

Please phone us collect or send your resume to

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Parklane Towers West
Suite 1616
Dearborn, MI 48126
(313) 271-1821

Equal Opportunity Employer M/F

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Software Engineers/ Programmers/ Systems Analysts

To participate in all aspects of the Target Machine Group in the development of the Ada Language System. These positions require 2-5 years' experience in one or more of the following: • system software • linkers • loaders • assemblers • compilers. A knowledge of Ada is helpful. Selected candidates will become part of a highly respected team producing the first full Ada system.

Project Team Leaders

Individuals with 5-7 years' experience in system software are needed to participate in the development of the Ada Language System (ALS). The ability to manage a group of ten Programmers and Analysts is essential. Knowledge of real-time support systems, linkers and code generators is required. Familiarity with embedded computer use such as the MC68000, Rolm 1666 and 1602B, VAX and MCP75 desirable.

an affirmative action equal opportunity employer

*Ada is a trademark of the DoD (Ada Joint Program Office)

We offer opportunities for professional growth inherent in a 500-person environment, coupled with excellent starting salaries and outstanding benefits. Please write to Judith M. Forsythe, SofTech, Inc., Dept. 679, 460 Totten Pond Road, Waltham, MA 02154.

SOFTECH

THE SOFTWARE TECHNOLOGY COMPANY

Southeast Bank

The continued growth of Florida's largest bank has created the following career opportunities:

SR. PROGRAMMER ANALYSTS (TANDEM)

Excellent ground floor opportunity to enter the innovative home banking area. A strong knowledge of TAM or COBOL is required. banking or financial applications background is desirable.

SR. SYSTEMS PROGRAMMER (IBM)

Our state-of-the-art environment includes an IBM 3081 and 3033 with MVS, CICS and JES 2. An in-depth knowledge of MVS, JES 2 and Assembler is required in addition to strong debugging skills.

Southeast offers a complete company paid relocation package, excellent compensation and benefits in addition to tremendous growth opportunities in one of the area's most dynamic Data Centers, Please send resume and salary history in confidence to: **Angela Smith, Employment Manager, SOUTHEAST DATA PROCESSING, INC., 1001 N.W. 7th Street, Miami, Florida 33136.**

We Are An Affirmative Action Equal Opportunity Employer

DATA BASE ANALYST

The Bendix Corporation, Electric Power Division is internationally known for its delivery of high performance electronic power generating systems for multimillion dollar applications.

experienced individual with a background in IMS DATA BASE Administration and Design. The qualified individual should also have demonstrated knowledge of CICS, TSO, COBOL, JES2, VSAM, and ISAM.

Educational prerequisite is a four year degree in computer science or some other related discipline.

Excellent benefits and salary available to qualified applicants. Send resume with salary history in confidence to M. Weiss, Bendix Corporation, Electric Power Division, Eatontown, New Jersey 07724.

Bendix

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FACULTY POSITIONS

Two Business Computer Information Systems positions to teach 12 semester hours at undergraduate level to General Business and Computer major students.

QUALIFICATIONS: A Doctoral degree in Business or Computer related field preferred or commitment to work toward Doctoral degree required.

SALARY/RANK: Assistant/Associate Professor. Nine Months salary from low $20's to low $30's depending on qualifications.

Candidates must submit resume and three letters of recommendation by February 15, 1983 (Positions are for September, 1983) to Dr. Herb Rebhun, Chairman, Department of Business Services, University of Houston Downtown College, One Main Plaza, Houston, TX 77002.

UHDC Is An EOE/AA Employer

MANUFACTURING ENGINEER

To develop tooling and provide technical expertise for immediate and long term manufacturing processes. The processes involve fabrication and assembly of small electrical devices. Requires BSEE and 3-4 years manufacturing experience which includes tool specification and design. Salary range: $2,400 to $2,600 per month. Send resumes to:

Nancy Thompson
M.D.E.S. #3-7
309 Second Ave. South
Minneapolis, MN 55401

Equal Opportunity Employer

SOUTHERN OPPORTUNITIES

S A Fortran or Assm Mini	$28K
P A RPG II and Cobol Sys 38	$25K
S A Banking Cobol Assembler	$32K
P A Mfg Copics or Mapics	$27K
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Jr CICS Sys Prog DOS VSE SNA	$26K
IMS DB Cobol Saudi Arabia	$Open

ROBERT HALF OF LOUISIANA, INC
P.O. Box 57620
New Orleans, LA 70157
(504) 835-4296

Associate Director, Swarthmore College provides technical assistance and advice to faculty and students, and maintains systems for academic computing and familiarity with administrative systems. Candidates should have BS/BA and 3 years experience in computing in higher education with previous PRIME experience highly desirable. Knowledge of communications equipment and microprocessors strongly preferred.

The college offers competitive salary, pleasant environment and good benefits. Please send resume, list of three references and salary history to: **Marietta Lee, Director Personnel, Swarthmore College, Swarthmore, PA 19081 by January 31, 1983.**

An Equal Opportunity Employer

Data Processing

System-38

A Unique Opportunity . . .

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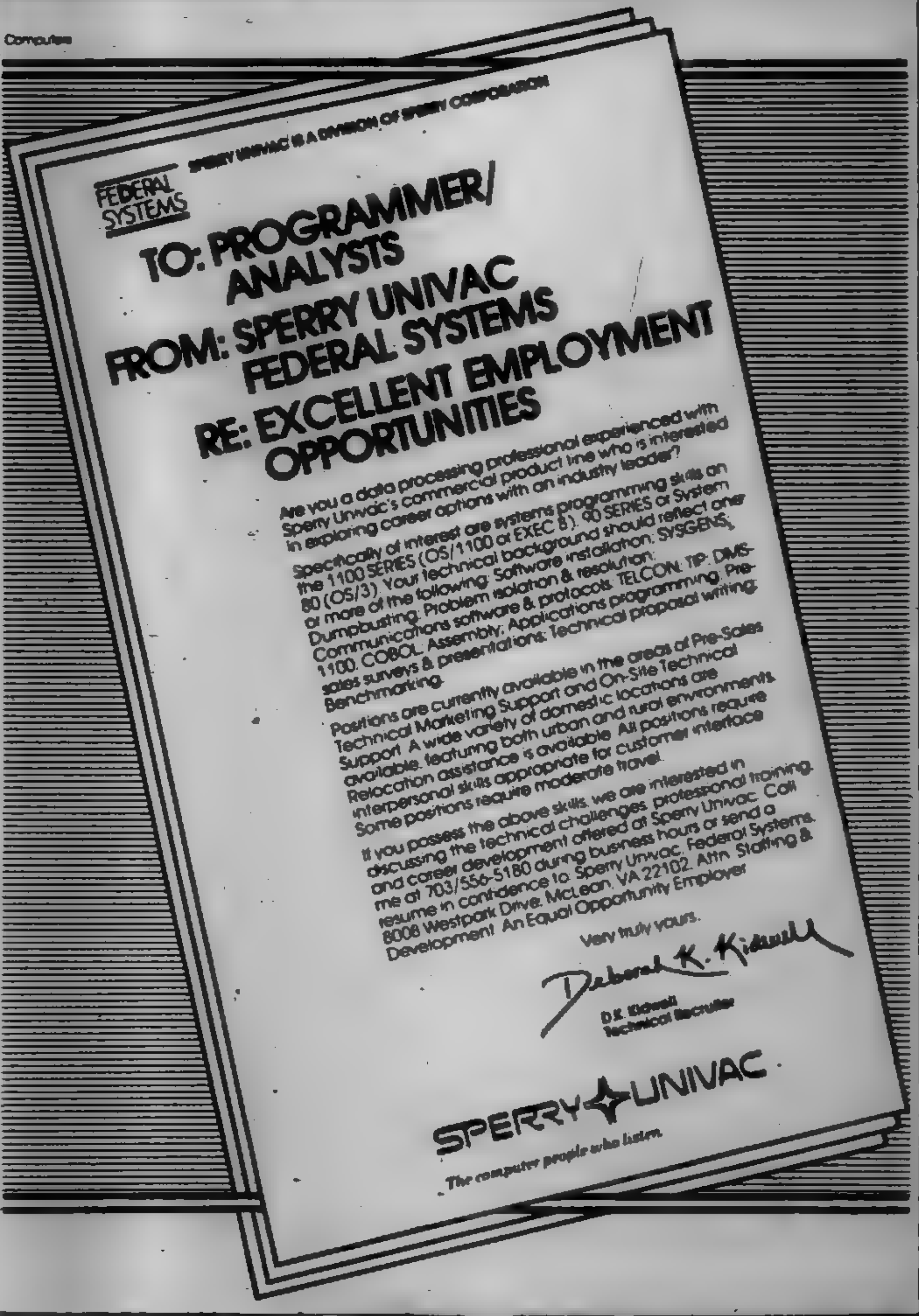

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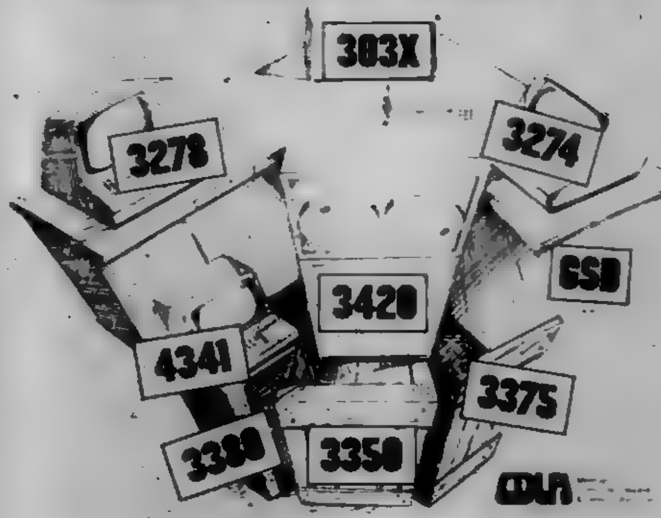

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Bulletin Board ads come in standard units (one column wide by one inch deep) and standard typefaces. (Units may be combined to produce deeper ads, but one column is the maximum width and no units of less than one inch are available.) Ads are arranged under headings (such as "IBM", "DEC" or "Printers"). The headline of the ad is set in larger, bold type, and should contain the standard equipment identification. The body copy should describe the equipment very briefly and give the person to contact. This is all the information an interested buyer needs to follow up. No ad should have more than one piece of equipment or software.

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Ads are accepted in the mail, by phone or by telecopier. Ads can be accepted up until the Monday before issue (7 days in advance of issue date). You should write out your ad before submitting it. (The standard size will hold approximately 25 words of copy.)

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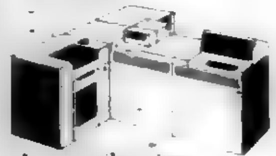

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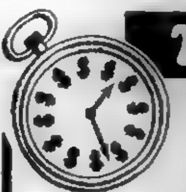

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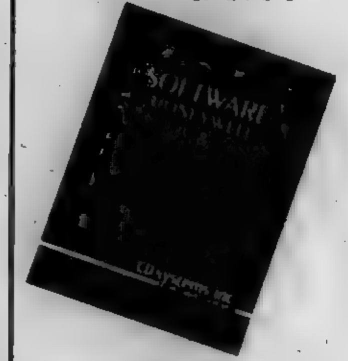

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Amer-Cal, Inc. 64
American Key Data 81
Anasazi 72
BDS Computer Corp. 9
John Beall Company 73
BMC Software 45
Budget Time-share 39
Bunker Ramo Corp. 30
Candle Corp. 6
Chubb Institute 52
Cincom Systems, Inc. 41,78
Circle Computer Services, Inc. 24
ComDesign 52
Compu-Share 36
Computer Associates 37
Computer Information Systems 53
Computer Management Research 70
Computerworld Office Automation 56
Computerworld Subscriptions 49
Computerworld Supplement 64
Computing Publications, Inc. 11
ComShare 76-77
CW Conference Management 70
Cord Cable Co. 48
Corodale 14
CRWTH 39
C-S Computer 24
Dallas Market Center 31
Data Base Management 44
Datapro Research Corp. 17
Datasphere 79
Datatrend 38
Dean Whitter Reynolds 26
Digital Controls Corp. 59
Digital Equipment Corp/
—NPM Peripherals 58
Digital Equipment Corp/
—Terminal Products Group 47
Digital Pathways 44
DuPont 50
Eastern Airlines 67
EEC Systems 38
EPS, Inc. 28
J.H. Ferguson & Associates 40
Fidelity 12
Fusion Products 36
Gejac, Inc. 79
General Research Corporation 50
General Systems 74
Graham Magnetics 61
G.R. Electronics 30
H & W Computer Systems 52
IBM 25,65
ICCP 46
Independent Computer Systems 32
Infodata Systems 5
Informatics, Inc. 80-81
Innovation Data Processing 7
ISSCO 33
KW Control Systems 48
J. W. Lampi, Inc. 22
Lee Data Corp. 42
Library Journal 10
Management Science of America 108
MCBA 13
McCormack & Dodge 68-69
MicroAge 42
Mini & Micro Educational 75
MTI Systems 60
Newcorp Products 46
Phoenix Systems 14
Popcom 21
Questronics 12
Qume 22
RAMTEK 18-19
L. F. Rothschild 24
SAS Institute 43,54-55
Science & Tech. Press 26
Signal Technology, Inc. 52
Software AG 53
Software Results 40
Software Technology 79
Solutions, Inc. 10
Southern Systems 21
Storage Technology 63
Stratus Computer 29
Syncsort 3
Sysed 60
Technalysis 72
Technical Management Services 79
Tech Products, Inc. 46
Teleray 15
Televideo Systems 74-75
Teltek 15
Texas Instruments 8
Texprint 62
Tone Software Corp. 38
Tri-Data 16
Walker Interactive Products 57
Wang 23
Whitesmith LTD. ....[illegible]
Wicat Systems 66
Wolfe Computer Testing 66
Zilog, Inc. 20

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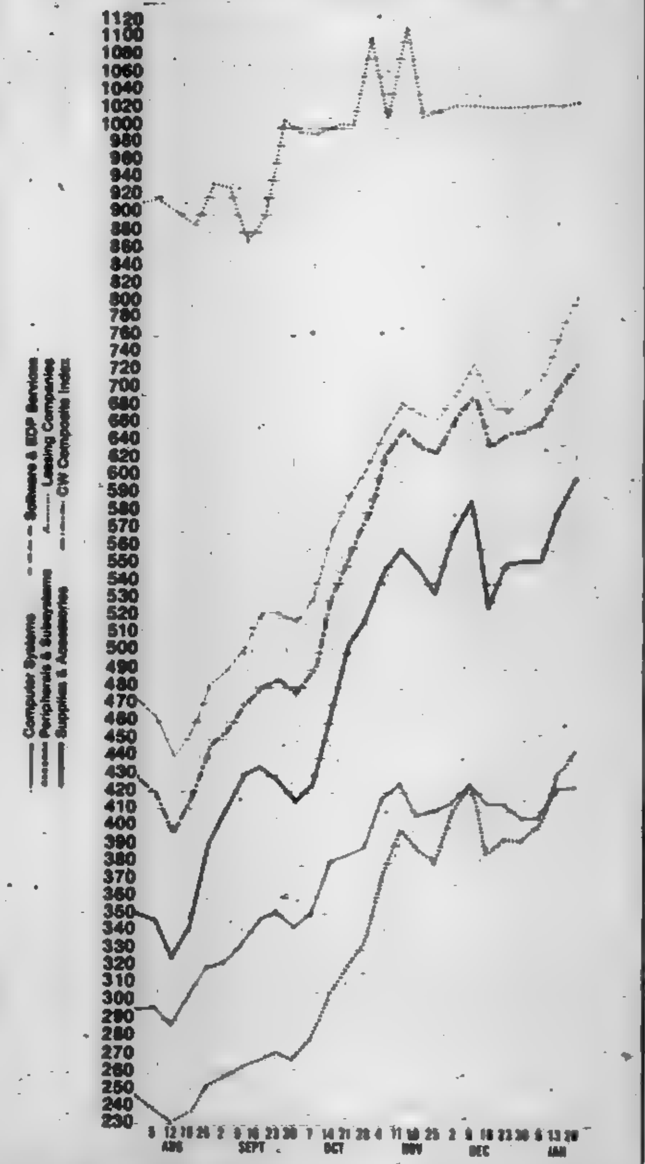

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EXCH		PRICE 1982-83 RANGE (1)	CLOSE JAN 19 1983	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
A	AMDAHL CORP	17- 39	33 1/2	+1 1/2	+4.6
N	BURROUGHS CORP	28- 48	46 3/4	+1 1/8	+2.4
O	COMPUTER AUTOMATION	7- 17	15 1/4	+1	+7.0
N	CONTROL DATA CORP	21- 43	41 1/2	+1 3/4	+4.4
N	CRAY RESEARCH INC	20- 45	40 3/4	+1 1/4	+3.1
N	DATA GENERAL CORP	20- 58	49 1/4	+4 1/2	+10.0
N	DATAPOINT CORP	11- 54	22	+2 5/8	+13.5
N	DIGITAL EQUIPMENT	62-113	106 1/4	+7 1/4	+7.3
A	EECO INC	6- 11	9 7/8	- 1/8	-1.2
N	ELECTRONIC ASSOC.	5- 12	10 7/8	- 1/2	-4.3
N	FLOATING POINT SYST	16- 31	30	+3 5/8	+13.7
N	[illegible]	22- 40	38	-1	-2.5
O	FULCRUM COMP GRP	1- 3	1/4	0	0.0
O	GENERAL AUTOMATION	3- 8	5 1/8	- 1/2	-8.8
N	HARRIS CORP	20- 43	38	-2 1/8	-5.3
N	HEWLETT-PACKARD CO	36- 82	77 1/4	+ 1/4	+0.3
N	HONEYWELL INC	60-104	89 1/2	-2 3/4	-2.9
N	IBM	48-100	98 1/2	+ 3/8	+0.3
O	IPL SYSTEMS INC	5- 8	6 1/2	+ 1/4	+4.0
O	MAGNUSON COMP SYSTS	2- 16	2 5/8	- 1/8	-4.5
N	MANAGEMENT ASSIST	7- 18	12 1/4	- 1/8	-1.0
O	MINI-COMPUTER SYST	1- 4	1/2	+ 1/8	+33.3
N	MODULAR COMPUTER SYS	6- 13	11 7/8	+ 5/8	+5.5
N	MOHAWK DATA SCI	10- 19	15 7/8	+ 1/8	+0.7
N	NCR	38- 95	91 1/4	- 1/4	-0.2
N	PERKIN-ELMER	17- 33	32 1/8	+2 1/2	+8.4
N	PRIME COMPUTER INC	16- 41	41 1/4	+1 1/4	+3.1
N	SPERRY CORP	21- 37	33 7/8	- 3/8	-1.0
O	TANDEM COMPUTERS INC	14- 34	27	+1 1/8	+4.3
N	TEXAS INSTRUMENTS	71-159	152 3/4	+17 3/8	+12.8
A	WANG LABS "B"	13- 35	33 3/4	+1 1/4	+3.9
A	WANG LABS "C"	11- 34	[illegible]	[illegible]	0.0
	LEASING COMPANIES				
O	BOOTHE FINANCIAL CP	22- 30	28 3/4	- 3/4	-2.5
N	COMDISCO INC	13- 44	43 3/4	+3 3/4	+9.3
O	COMMERCE GROUP CORP	1- 1	1/4	0	0.0
O	COMPUTER INVSTRS GRP	1- 2	3/8	0	0.0
O	CONTINENTAL INFO.SYS	2- 20	17	+2 1/2	+17.2
N	DPF INC	5- 13	8 5/8	+ 5/8	+8.0
O	ITEL	1- 5	7/8	0	0.0
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	18- 38	38 1/4	+1 1/4	+3.3

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	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 6	3 1/2	0	0.0
O	ADVANCED SYSTEMS INC	9- 22	22	+2 3/4	+14.2
O	AGS COMPUTERS INC	7- 17	16	+ 1/2	+3.2
N	ANACOMP INC	9- 15	18 1/2	+2 5/8	+16.5
O	ANALYSTS INTL CORP	5- 9	8	0	0.0
A	APPLIED DATA RES.	16- 43	43 1/4	+3 1/2	+8.8
O	ASK COMPUTER SYSTEMS	12- 27	23 1/2	- 7/8	-3.5
B	ASTRADYNE COMP IND	1- 3	3 3/4	+ 7/8	+30.4
N	AUTOMATIC DATA PROC	21- 38	36	-1 1/2	-4.0
O	CGA COMPUTER ASSOC	5- 10	8 3/4	0	0.0
O	COMPUTER ASSOC INT'L	12- 40	38	+ 1/2	+1.3
O	COMPUTER HORIZONS	1- 3	10 1/2	+1 1/4	+13.5
B	COMPUTER NETWORK	4- 8	7 3/8	- 1/4	-3.2
N	COMPUTER SCIENCES	11- 20	18 1/4	+ 7/8	+5.0
O	COMPUTER TASK GROUP	8- 18	15 3/4	-1 1/4	-7.3
O	COMPUTER USAGE	2- 8	6 1/2	+ 1/4	+4.0
O	COMPUTONE SYSTEMS	12- 30	27	+ 1/8	+0.4
O	CONSERV CORP	11- 20	16 1/2	+1 1/2	+10.0
O	CONSHARE	8- 10	9	+1 1/8	+20.0
N	CULLINANE DATABASE	12- 33	31 3/4	+4 1/2	+16.5
O	[illegible]CARE SYSTEMS INC	6- 18	15	+ 3/4	+5.2
O	DATA DIMENSIONS INC	1- 3	3/4	0	0.0
O	DATATAB	0- 4	5/8	0	0.0
O	DIATRON CORP	2- 4	3	0	0.0
N	ELECTRONIC DATA SYST	19- 50	47 1/2	+ 5/8	+1.3
O	INFORMATICS INC	10- 24	20 3/4	+ 3/4	+3.7
O	INSYTE CORP	1- 3	2 1/8	- 1/8	-5.5
O	JPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	4- 8	8 3/4	+ 1/2	+6.0
A	LOGICON	12- 30	30	+1 1/4	+4.3
O	MNGT SCI AMER INC	6- 28	27 3/4	+4	+16.8
O	MATHEMATICA INC	12- 20	19 1/2	+ 1/4	+1.2
O	MATHEMATICAL APP GRP	12- 18	18	+3	+19.7
O	NATIONAL DATA CORP	13- 26	18 3/4	- 5/8	-3.2
O	PANSOPHIC SYSTEMS	8- 21	21	+2	+10.5
N	PLANNING RESEARCH	6- 13	12 3/4	+1 3/4	+15.9
O	PROGRAMMING & SYS	1- 3	3	+ 1/8	+4.3
O	REYNOLDS & REYNOLDS	17- 36	35 1/4	+1 1/2	+4.4
O	SEI CORP	21- 45	42 1/4	+ 1/4	+0.5
O	SHARED MEDICAL SYST	28- 55	51 1/2	- 3/4	-1.4
O	SCIENTIFIC COMPUTERS	6- 13	11 1/4	+ 1/4	+2.2
O	SOFTWARE AG	5- 17	10 1/2	+ 3/8	+3.7
N	TYMSHARE INC	12- 30	22 3/8	+1 7/8	+9.1
A	URS CORP	10- 18	18	+1 1/8	+6.6
N	WYLY CORP	7- 13	11	+1 1/4	+12.8
	PERIPHERALS & SUBSYSTEMS				
N	AM INTERNATIONAL	1- 15	2 1/2	0	0.0
A	ANDERSON JACOBSON	8- 26	22 3/8	-1	-4.2
O	AUTO-TROL TECHNOLOGY	8- 18	15 3/4	- 3/4	-4.5
O	BANCTEC INC	7- 33	18 1/4	- 1/8	-0.6
A	BEEHIVE INT'L	4- 10	10 1/4	+1 3/8	+15.4
A	BOLT,BERANEK & NEW	9- 34	33 1/2	+1 7/8	+5.9
O	CAMBEX CORP	2- 4	2 1/8	- 1/8	-5.5
N	CENTRONICS DATA COMP	8- 17	13 7/8	+ 7/8	+6.7
A	CETEC CORP	4- 7	6 3/8	+ 1/4	+4.0
O	COGNITRONICS	2- 12	11 1/8	+1	+9.8
O	COMPUTER COMMUN.	1- 2	3/4	0	0.0

EXCH		PRICE 1982-83 RANGE	CLOSE JAN 19 1983	WEEK NET CHNGE	WEEK PCT CHNGE
A	COMPUTER [illegible]	[illegible]	61	[illegible]	[illegible]
O	COMPUTER DEVICES INC	[illegible]	[illegible]	[illegible]	[illegible]
O	COMPUTER TRANSCEIVER	[illegible]	[illegible]	[illegible]	[illegible]
N	COMPUTERVISION CORP	[illegible]	[illegible]	[illegible]	[illegible]
N	CONRAC CORP	[illegible]	[illegible]	[illegible]	[illegible]
A	DATA ACCESS SYSTEMS	[illegible]	[illegible]	[illegible]	[illegible]
A	DATAPRODUCTS CORP	16- 36	[illegible]	[illegible]	[illegible]
A	DATARAM CORP	[illegible]	[illegible]	[illegible]	[illegible]
O	DATUM INC	[illegible]	5 1/4	[illegible]	[illegible]
O	DAVID JAMISON CARLYL	[illegible]	[illegible]	[illegible]	[illegible]
O	DECISION DATA COMPUT	[illegible]	[illegible]	[illegible]	[illegible]
O	DELTA DATA SYSTEMS	[illegible]	[illegible]	[illegible]	[illegible]
N	ELECTRONIC [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B	EVANS & SUTHERLAND	16- 46	[illegible]	[illegible]	[illegible]
O	GANDALF TECHNOLOGIES	[illegible]	[illegible]	[illegible]	[illegible]
N	GEN'L DATA COMM IND	[illegible]	[illegible]	[illegible]	[illegible]
O	GENERAL TERMINAL CP	[illegible]	[illegible]	[illegible]	[illegible]
O	GREAT SOUTHWEST IND	[illegible]	[illegible]	[illegible]	[illegible]
N	HAZELTINE CORP	[illegible]	[illegible]	+1	[illegible]
O	ICOT CORP	[illegible]	6	+1	[illegible]
O	INFORMATION INTL INC	[illegible]	[illegible]	[illegible]	[illegible]
O	INTEL CORP	[illegible]	[illegible]	[illegible]	[illegible]
O	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
N	LUNDY ELECTRONICS	[illegible]	[illegible]	[illegible]	[illegible]
A	MSI DATA CORP	[illegible]	[illegible]	[illegible]	[illegible]
O	NETWORK SYSTEMS CORP	[illegible]	[illegible]	[illegible]	[illegible]
O	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
N	PARADYNE CORP	[illegible]	[illegible]	[illegible]	[illegible]
A	PENRIL CORP	[illegible]	[illegible]	[illegible]	[illegible]
O	QANTEX CORP	[illegible]	[illegible]	[illegible]	[illegible]
N	RECOGNITION EQUIP	[illegible]	[illegible]	[illegible]	[illegible]
O	SCAN DATA	[illegible]	[illegible]	[illegible]	[illegible]
A	STORAGE TECHNOLOGY	[illegible]	[illegible]	[illegible]	[illegible]
O	SYKES DATATRONICS	[illegible]	[illegible]	[illegible]	[illegible]
N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
A	TEC INC	[illegible]	[illegible]	[illegible]	[illegible]
N	TEKTRONIX INC	[illegible]	[illegible]	[illegible]	[illegible]
N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
N	[illegible] DATA SYSTEMS CP	[illegible]	[illegible]	[illegible]	[illegible]
A	[illegible] INC	[illegible]	[illegible]	[illegible]	[illegible]
O	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
N	[illegible] INC	[illegible]	[illegible]	[illegible]	[illegible]
	SUPPLIES & ACCESSORIES				
N	AMERICAN BUS PRODS	[illegible]	[illegible]	[illegible]	[illegible]
O	BALTIMORE BUS FORMS	[illegible]	[illegible]	[illegible]	0.0
N	BARRY WRIGHT	[illegible]	[illegible]	[illegible]	[illegible]
O	CYBERMATICS INC	[illegible]	[illegible]	[illegible]	[illegible]
A	DUPLEX PRODUCTS INC	[illegible]	[illegible]	[illegible]	[illegible]
N	ENNIS BUS. FORMS	16- 31	[illegible]	[illegible]	[illegible]
N	3M COMPANY	43- 80	79 [illegible]	[illegible]	[illegible]
N	MOORE CORP LTD	[illegible]	[illegible]	[illegible]	[illegible]
N	NASHUA CORP	[illegible]	[illegible]	[illegible]	[illegible]
N	STANDARD REGISTER	[illegible]	[illegible]	[illegible]	[illegible]
A	TAB PRODUCTS CO	[illegible]	[illegible]	[illegible]	[illegible]
N	WALLACE BUS FORMS	[illegible]	[illegible]	[illegible]	[illegible]

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CIAL**REPORT**

Inside — Data Communications Networks: The Long and Short of It

Salaries for DP Operations In Good Shape: Afcom Survey

By Bob Johnson
CW New York Bureau

ANAHEIM, Calif. — Computer operations personnel are faring well in this gloomy economy. Nearly all salaries in operations job categories rose in 1982, and projections for 1983 show substantial increases as well, according to the annual salary survey conducted by the Association for Computer Operations Managers.

Afcom's 1982/83 survey included data entry, data control, computer operations and DP operations job titles. The salary breakdown was performed on a monthly basis and included three variations: national, geographic and size of installation. National salaries represent all areas of the country; the geographic listings include the Western, Eastern, Midwestern and Southern regions; and the size of installation breakdown measures salaries by equivalent monthly rental of installed hardware.

In the area of DP operations management, the survey showed DP operations managers at a national average monthly salary of $2,918, representing a 13.3% gain over last year's figures. Operations managers had the best average salaries in the West, revealing a monthly figure of $3,367. Afcom's 1983 projections point to an 8.4% increase.

Job schedulers, the only category in the survey that did not show an increase, had an average salary of $1,596/mo, compared to last year's $1,602/mo. Regionally, however, the scheduler's pay was strong in the Midwest, where it averaged $1,862/mo. Projections for next year show a 7.3% increase.

An operations analyst's average national monthly salary was $2,037, with a 1983 increase slated for 6.3%,

(Continued on Page 6)

Drops Corporate Tax Hint

Reagan Lauds High-Tech Heartland

By Bill Laberis
CW Staff

BEDFORD, Mass. — President Ronald Reagan brought his free-enterprise juggernaut to the high-technology heartland here last week, saying the success of the computer and electronics industry in Massachusetts serves as a metaphor for the nation's strength and hope for the future.

But it was Reagan's surprise suggestion that the government abolish the federal corporate income tax that brought the only applause interruption from the high-tech executives during his one-hour visit with them at Millipore Corp. headquarters here.

"I'll probably kick myself for saying this," Reagan said. "The corporate tax is very hard to justify."

Speaking to members of the Massachusetts High Technology Council during part of a whirlwind, four-hour tour of Greater Boston, Reagan pledged he would include in his proposed budget submission this week "unprecedented increases" in government-sponsored research and development. The benefits of this research, he said, will be channeled into "our more promising areas," a specific allusion to the high-technology industries.

The president further promised he would devise and submit a definitive plan designed to help families pay the rising costs of education, thereby helping to bridge the gap between the number of electronics graduates and the greater number of jobs begging for them.

Despite his State of the Union address on Jan. 25, in which he suggested government take a more active role in promoting economic recovery, the president also made it clear he still believes business thrives best in an environment where both taxes and government intervention are kept at a minimum.

"This [state] is a living laboratory of progress and proof that the private sector can work with local govern-

(Continued on Page 4)

Trends Impact Software Profile

By Robert Batt
CW West Coast Bureau

The increasing use of contract programmers, fourth-generation languages and the information center concept will all have an important influence on software developments in 1983.

These are the main conclusions drawn from recent interviews conducted with several computer industry association representatives and management information systems executives.

According to Steven Epner, founder of the Independent Computer Consultants Association, which represents 1,000 companies nationwide, the last three to four months have seen a significant increase in the demand for third-party programmers.

"During the recession, many companies cut back by imposing hiring freezes and reducing the size of their data processing staff. Users, on the other hand, did not cut back on their demand for services, so that now there is a lot of pent-up demand for DP. In an attempt to satisfy this demand, computer departments, which still face a freeze on head count, are being forced to turn to outside contractors for assistance," Epner said.

Another trend that seems to be accelerating is the shift toward so-called fourth-generation languages. Bill Costello, vice-chairman of the Greater Boston chapter of the Associ-

(Continued on Page 6)

U.S. Observers Eye Soviet Tech

By Jim Bartimo
CW Staff

Whether the Soviet Union is ahead, behind or keeping pace with U.S. computer technology depends upon whom one asks.

Some industry experts contacted by *Computerworld* last week said that Soviet military technology is quite advanced, but most agree that commercial applications are three to five years behind the U.S.

"The technology of the country is superb, but dedicated to a different cause," according to Charles P. Lecht, president of the New York-based think tank, Lecht Sciences, Inc. Lecht has traveled to the Soviet Union to observe Soviet computers and reported his findings to legislative committees.

(Continued on Page 5)

Kirk R. Wilkinson Photo

President Ronald Reagan Speaking at Millipore Corp. Last Week

Available Through Data Base
First All-Electronic Novel Published

By Jim Bartimo
CW Staff

It was the day after the end of the world . . . Philip had hoped to pull off a miracle and had managed to do just the reverse. He had pitted everything on one clever move — and lost.

Hundreds of fashionable people — in fact, the whole artistic community of the city — had appeared in the freight elevator only a few hours before. The most important, or rather the most influential of the newpaper journalists, was the personable Suede.

So reads an excerpt of what is thought to be the first electronically published novel, which was recently made available to subscribers of Source Telecomputing Corp.'s The Source public data base system.

Blind Pharaoh was written in Toronto in 61½ hours on an Apple Computer, Inc. Apple III. The 20,000-word book was edited chapter by chapter on another Apple at Source's headquarters in McLean, Va., where nine Prime Computer, Inc. 750 minicomputers allow 24,000 subscribers to access the data base through modems at 1,200 bit/sec, according to a Source spokesman.

The 19-chapter book is available for as little as $2.03 by calling it up on a home computer and downloading it to a floppy disk or printer for storage, a company spokesman said.

Author Burke Campbell, a native of Texas and resident of Toronto, had previously written another three-day novel for a local contest and has also authored radio dramas for the Canadian Broadcasting Co.

"*Blind Pharaoh* is a mystery thriller," Campbell said last week. "It's the story of a mysterious man who travels around North America in his limousine manipulating the lives of other people. It's a kind of science fiction novel, but most of the technology in it already exists.

"It's very chic and very sexy," he noted.

Also chic and sexy were the conditions under which the quickie novel was written. The three-day writing spree was a media event held at an art gallery to coincide with a Canadian computer show also held in Toronto.

"I arrived in a black chauffeur-driven limousine in a sweat suit made out of black sequins and I wore black cowboy boots," Campbell said. "I mounted the black vinyl stage and there was the microcomputer."

Campbell wrote for most of the three days following his arrival, seldom leaving the stage as his meals were brought to him. "I was working from a general outline, but I wrote most of it right then," Campbell said. Campbell said he was surprised at the impact his novel is having and said that the new method of distribution has touched a nerve with the public. He also said he enjoyed writing a book that was so quickly delivered to the reading public.

"I think the business community must understand that the artist will show how this technology will be used," Campbell noted. "Fashion plays a very large part in this, so the artist is much more influential than the businessman."

Asian Center Urges Resolution Of U.S. Trade Disputes With Japan

WASHINGTON, D.C. — The U.S. should immediately draft a concrete timetable for resolving trade disagreements between this country and Japan.

That is one of several recommendations on U.S.-Japanese trade and defense topics offered in a report released by the Asian Studies Center, an influential think tank based here that is pushing for immediate action for the U.S. to acknowledge improved U.S.-Japanese relations — especially following a recent visit here by Japanese Prime Minister Yasuhiro Nakasone.

The center is part of the Heritage Foundation, a politically conservative policies study group. It officially came into being last Tuesday and is headed by Richard V. Allen, former national security adviser to President Ronald Reagan.

"At times in recent months, the trade-related recriminations that Japan and the U.S. have hurled at each other almost have blurred the fact that the two nations have enormously strong and warm ties binding them to each other," the report said. "It is the underlying strength of the relationship that makes it so important to resolve the trade differences," the study said, calling the trade issue "urgent" and the "single most divisive matter" in U.S.-Japanese relations.

Noting Secretary of State George Shultz's upcoming visit to Japan, the Asian center suggested his talks with Japanese officials would provide a good opportunity to begin development of "a five-year plan with specific target figures" to reduce the trade imbalance between the two countries.

This Week

SPECIAL REPORT

Data Communications Networks . . . . Follows Page 56

NEWS

High-Tech Execs See Visit as 'Open Door' 4
Manager Cuts Maintenance Time by 70% 7
Survey Finds Data Administration 'Flourishing' 8
Study Finds CIO Ranks High in Corporation 9
Poll Finds QA Analysts Enthusiastic Over Jobs 11
Relational Software Renamed; Oracle Boosted 12
U.S. Not Alone in Software Expertise: Futurist 13
Bank Users Group Gets Apple's Micro Outlook . . . 14
AT&T Squaring Off in BOC Detariffing Battle 15
AT&T Insists BPSS 'Basic,' Not 'Enhanced' 16
Automation Seen Reducing Workers' Control 17
Try to Prevent Contract Litigation: Lawyers 19
Bibliography of Computer Books Released 20
Turnaround Time 23
Firm Meets 'Focus' Needs With Minicomputer 26
Manager Squeezed Out of Entry/Edit System 27

EDITORIAL

Editorial: Don't Pack Your Bags Yet 28
Softline: A Look at Computing in Southeast Asia . . 29
Human Connection: He'll Take the Job 29

SOFTWARE & SERVICES

Consultant: IBM's ADF Either Loved or Hated 31
Compiler Bows for System/34-Prime Migration 32
Release 8.4 of DCD II Unveiled 33
Report Generator Provides Link to 'Soloman' 34
IBM Unwraps Updates for System/38 SNA/SDLC . . 35
Designer Cuts Processing Time 36
'Procxref' JCL Utility Gets ICCF Support 38
SIR/DBMS Version Announced 39
Receivables Package Out for System/38 40

COMMUNICATIONS

Users Demanding Local Net Advantages 47
Quadram Unveils Monitor for IBM Micro 48
Terminals Target Hostile Environments 49
IRC Division Unveils Controller 50
Identification Terminal Out for Banks With ATMs . . 54
Hewlett-Packard Unveils Protocol Analyzer Unit . . . 56

SYSTEMS & PERIPHERALS

Users Would Pay for Diagnostics: Study 57
System Performs Video Graphics 58
Kodak Unveils Mini-Based Info System 59
Diskette Duplicating System Unveiled 60
System Offers Multiuser Capability 61
DG Adds Light Pen to Workstation 62

OFFICE AUTOMATION

Tests Gauge Job Applicants' Skill Levels 65

COMPUTER INDUSTRY

IBM Revenues Not Hurt by the Recession 67
Sporck: National Semi Prefers Independence 67
NCR Earnings Show Upturn 68
Lisa's Adopted Uncle Tells Why He Left NAS 69
Micros Opening Doors for Nets: Geisco Head 70
Inman Appointed President of Fledgling MCC 71
IRS Regulation Seen Detrimental 72
Ungermann-Bass Agrees to Acquire Amdex 74
Brown Pushes High-Tech Policies in Senate 75
Exec: Future Legislation May Harm Industry 76

ADVERTISING INDEX

ADVERTISING INDEX 104

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Please address all correspondence to the appropriate department at Box 880, 375 Cochituate Road, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153.

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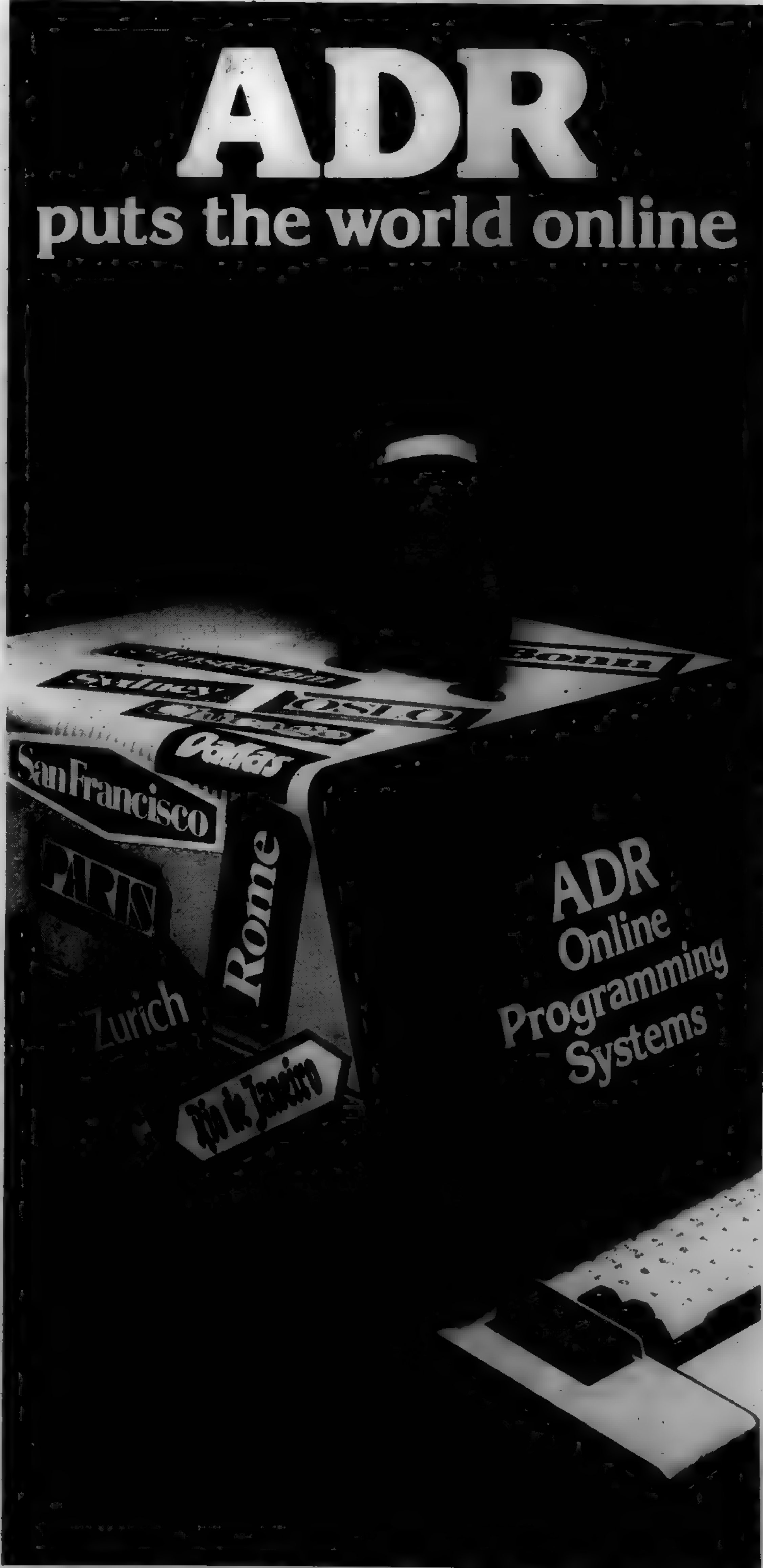

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Reagan Lauds Success of High-Tech Heartland

(Continued from Page 1)

ment and move forward," he said.

Reagan began his day with a visit to the Opportunities Industrial Center, a federally and privately funded training center at which unemployed Bostonians learn word processing and other computer fundamentals. Speaking of his visit to the center, Reagan commented, "I had the privilege of looking into America's future, and the future looked good."

However, the center operates today on half the money it was allocated two years ago, and therefore has half the trainees. Ironically, the budget cuts originated in Washington as a result of Reagan administration cost-cutting initiatives.

Reagan also visited a Digital Equipment Corp. assembly plant in Roxbury, a nearly all black and very economically depressed area of the city. The DEC plant, the only building standing in what was supposed to be an industrial park, was made possible in part by various federal programs designed to include the urban poor in the high-tech boom.

Some $7 million in federal funds built roads into the park, and DEC's $3 million plant investment was financed with tax-free industrial revenue bonds. The Reagan administration tried — and failed — to eliminate the revenue-bond program.

After an unscheduled stop for a beer and handshakes at a local Irish pub, Reagan left Boston for Millipore's headquarters, located in the heart of the Rt. 128 high-tech belt. He was warmly greeted by a packed house of electronics industry executives and High Technology Council representatives.

Kirk R. Williamson Photo

President Ronald Reagan Addresses Massachusetts High-Tech Executives

The president had come to Boston at the request of Dee d'Arbeloff, Millipore's chairman, who said the president's journey to Massachusetts "is a clear indication of his interest in high-technology industry."

But clearly, it was the area's jobs-producing record over the last four years, during which over 60,000 new jobs were developed by high-tech firms, that drew Reagan here. And it was in the interest of preserving the relative health of the area's and nation's high-tech companies that council members proposed to Reagan specific ways in which the federal government could lend a hand.

Ray Stata, president of Analog Devices, Inc., told Reagan, "It is a simple fact that our educational system today does not have the capacity to educate and train enough people with the right qualifications to sustain our industry's growth."

Stata said this "national tragedy" in education impairs high-tech growth and could retard Reagan's planned military buildup with "a lack of qualified people to design, build and operate a new generation of intelligent weapon systems.

"In reality, we're fighting a cold war on two fronts — militarily with Russia and economically with Japan, but with the same troops, namely our technological work force," Stata told the president.

On the council's behalf, Stata proposed a matching grant program whereby the federal and state governments would match industry grants made to technical education and university research.

Replying to a council question on trade barriers, Reagan said he, like the council, favors free trade, but only with those countries that do not erect tariff and nontariff barriers to trade. In a probable reference to Japan, Reagan said, "There are some countries we trade with who make it very difficult for our products to enter their markets," saying that other nations are "zeroing in on our high-tech markets."

High-Tech Execs See Visit as 'Open Door'

By Bill Laberis
CW Staff

BEDFORD, Mass. — "We have his attention now. The words 'high tech' are now on his agenda, and he understands it is an important aspect of the economy. It's a real breakthrough, more than we could have dreamed happening. We now have an open door."

In this way, Edson deCastro, president of Data General Corp., enthusiastically summarized President Ronald Reagan's visit last week to Millipore Corp. here to address the Massachusetts High Technology Council.

Shortly after Reagan departed for Washington, deCastro noted that it was probably the lingering national unemployment problem that sent the president to Massachusetts, as the computer industry represents "a sector not having big unemployment problems."

Bit of Irony

As Reagan's detractors and critics pointed out, there was a bit of irony in his visit to both a Digital Equipment Corp. inner-city assembly plant and to a federally funded computer training center. Budget cuts favored or proposed by Reagan would adversely impact similar projects, both of which the president touted.

"Of course, in politics there is a risk when you begin to cut programs," deCastro said. "You have to be very careful of the consequences. Now, we have a voice in the White House and that voice will be heard."

Asked what the federal government should do to help the high-tech sector, deCastro said increased direct aid to higher education is in order, as well as the imposition and enforcement of tougher testing standards in elementary and secondary schools across the country.

"It would also be prudent for the government to foster an economic and tax environment conducive to risk taking and investment," deCastro said.

Another member of the High Technology Council, John Cullinane of Cullinane Database Systems, Inc., said he believes Reagan is "fascinated and interested in entrepeneurs . . . which he sees as a big part of the American success story."

Asked what he would like the federal government to do for high tech, Cullinane suggested the president should act to eliminate the differences in the cost of capital in Japan and the U.S. The government should "make sources of funds easier and cheaper to acquire . . . There has not been enough emphasis on this point," Cullinane remarked.

And Roger Wellington, chairman of Augat, Inc., said the government should work to eliminate tax biases that discourage high-growth companies.

"The effective tax paid by companies in the $25 million to $1 billion range during 1976 to 1980 was more than double that paid by companies in the Fortune 100 list — almost 35% against only slightly more than 15%," he said.

Congress Also to Address DP Issues

WASHINGTON, D.C. — While 1983 may be remembered as the year of big politics, and even President Reagan officially recognized high tech, there was evidence last week that congressional subcommittees have long appreciated the importance of high technology to the nation's future.

In a document entitled "The Future Agenda" — released Tuesday by the Congressional Clearinghouse on the Future — computers, communications, robotics and a host of related social, judicial and economic issues were heavily emphasized as matters that will receive special attention in the future sessions by the committees and staff of the House of Representatives.

The list of future "legislative challenges," broken down by committee and subcommittee, was prepared to involve the Congress in a national dialogue on the future, according to Rep. Albert Gore Jr. (D-Tenn.), who is the Clearinghouse chairman. The Clearinghouse is a bipartisan organization of 75 congressmen and senators created, in Gore's words, "to provide structured opportunities for members of Congress to take time out from hectic events to consider a longer-term perspective."

Gore noted, "The entire world — and outer space, too, for that matter — is broken down into different jurisdictions, which are then assigned to the roughly 200 subcommittees." The compilation of "The Future Agenda" over a two-year period has already led some subcommittees to rethink their priorities, according to Gore.

High-technology issues noted in the agenda include the effects on education, citizens' rights and employment of the advent of the information-intensive, services-oriented economy. Research and development, deregulation of the telecommunications industry, computer crime, transborder data flow and office automation are just some of the many high-technology issues presently before numerous House subcommittees.

The purpose of the agenda, Gore said, is not to list subcommittee preferences for disposing of these issues, but to identify better the range of choices that will be available to Congress when the matters come up for legislative deliberation and to give the public greater access to the development of those choices. "We have to spend a little more time anticipating problems before they become crises," Gore said.

U.S. Observers Analyze Soviet Technology

(Continued from Page 1)

"Americans go over there and see no banking systems," Lecht said. "The conclusion they come to is that the Soviets know nothing about computers. But they forget that the Soviets don't have many banks."

Military Uses

Much of the Soviets' computer technology is devoted to military applications, Lecht said. The Soviets have access to superior memory technology from Poland and superior processor technology from Czechoslovakia and Hungary. The country's large-scale integration capability was termed by Intel Corp. in 1980 to be within a year of the capability of the U.S., Lecht said.

Also considered superior are the Soviets' processor control capabilities, including computer-aided design and computer-aided manufacturing. "Their processor control is the best in the world," Lecht said. "It's one thing to send a man to the moon — it's another to send a robot up" that performs the duties of a man.

But S.E. Goodman, University of Arizona professor of management information systems and public policy, said that Soviet military technology is relatively backward. "The most powerful Soviet scientific computer is comparable to a [Burroughs Corp.] B7700," he said.

Goodman — who has also contributed information on the Soviets to congressional committees — pointed out that Soviet commercial applications are also behind the U.S., but have advanced significantly in recent years. "Their progress has to be measured in two ways — compared to their own past and compared with us. If you look at what they were doing a few years ago," Goodman said, "it looked like American equipment from the 1950s.

"They produce thousands of machines per year," Goodman continued. While the Soviets have made great strides in computer technology, Goodman said, "I'm not going to sell my stock in IBM yet."

Another industry expert, Lynn Gallup of Control Data Corp.'s import/export subsidiary, Control Data Commerce International, Inc., agreed that the Soviets are making more rapid advances — even at the expense of the domestic economy. "The Russians are absolutely determined not to be second-rate," he said. "I don't think Americans understand how far they will go."

Soviets Seen Entering Third Phase

By Jim Bartimo
CW Staff

Many Soviet watchers say there has been an information freeze regarding Soviet computers since the invasion of Afghanistan in 1979. However, the Soviets may be about to enter their third phase of computer development, according to a University of Arizona professor of management information systems and public policy, S. E. Goodman.

"We have not seen the ES-3 [also known as Ryad-III] in production yet, but it's likely to be like the IBM 30 series or 4300," Goodman said.

Phase One of the Soviet computer development involved the Minsk computer line. It is out of production now, but the last of its 32 models was much like an IBM 1410, according to Goodman.

Sometime after the Minsk line of computers came the Ryad I series (also known as the ES-1 series) — a duplicate of the IBM 360. The Ryad II, a duplication of the IBM 370, came shortly after, the University of Arizona professor said.

"In many ways, their technology is our technology," Goodman said. "They've tried to achieve software compatibility and peripheral compatibility."

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Survey Finds Operations Personnel Faring Well

(Continued from Page 1)

according to Afcom. Geographically, this group which was included in the survey did best in the Midwest, coming in with an average monthly salary figure of $2,225.

Operations Managers Up 10.2%

The computer operations group covered nearly the entire gamut of this data processing segment, including such titles as computer operations manager, shift supervisor, senior operator, operator and operator trainee. Operations managers — who are the higher end of the operations spectrum and have immediate control over what occurs in the computer room — had average monthly salaries of $2,257, up 10.2% over last year, with the highest paid portion in the West at $2,381. Projections for 1983 look to be on the average an increase of 8.4%, the Afcom survey said.

Shift supervisors came in at $1,901/mo and are expected to get increases in '83 of 7.7%. Their highest incomes were reported from the West as well, the average there being $2,113.

Operator categories had good results also, Afcom stated. Its survey listed the average monthly salary of a senior operator at $1,539, an operator at $1,282 and an operator trainee at $1,038. Next year's increases are calculated to be 7.6%, 7.6% and 8.0%, respectively.

Reports from the data control area listed salaries for the positions of data control manager, shift supervisor, tape librarian, senior control clerk and control clerk. Data control managers had a national average salary of $2,002, representing a 9.8% increase over 1982, according to the survey.

DATA ENTRY

JOB TITLE	RANGE	AVERAGE	MEDIAN	PROJECTED 1983 AVERAGE INCREASE
Keypunch Operators	640-1.669	1.019	1.027	7.1%
Key-to-Disk Operator	650-1.600	1.016	1.006	7.4
Senior Operator	725-1.870	1.236	1.106	7.9
Shift Supervisor	833-3,289	1,464	1,450	[illegible]
Data Entry Manager	900-4,160	1,723	1,700	8.2

DATA CONTROL

JOB TITLE	RANGE	AVERAGE	MEDIAN	PROJECTED 1983 AVERAGE INCREASE
Control Clerk	640-1,725	1,101	1,056	7.4%
Senior Control Clerk	865-2,100	1,329	1,307	7.2
Tape Librarian	650-2,000	1,182	1,153	7.6
Shift Supervisor	725-3,289	1,652	1,600	8
Data Control Manager	1,000-4,160	2,002	2,090	7.3

COMPUTER OPERATIONS

JOB TITLE	RANGE	AVERAGE	MEDIAN	PROJECTED 1983 AVERAGE INCREASE
Operator Trainee	675-1,728	1,038	1,002	8%
Operator	675-2,234	1,282	1,271	7.6
Senior Operator	900-2,425	1,539	1,545	7.6
Shift Supervisor	1,133-3,289	1,901	1,822	7.7
Computer Operations Manager	900-4,160	2,257	2,240	8.4

DATA PROCESSING OPERATIONS

JOB TITLE	RANGE	AVERAGE	MEDIAN	PROJECTED 1983 AVERAGE INCREASE
Operations Analyst	1,078-3,172	2,037	1,968	6.3%
Scheduler	800-3,192	1,596	1,587	7.3
Data Processing Operations Manager	1,385-5,485	2,918	2,644	8.4

Source: Afcom

1982 Salaries and Projected 1983 Increases

Data control personnel in the western portion of the U.S. reported the best monthly salaries, averaging about $2,331. Increases in this area for 1983 are predicted to be in the area of 7.3%, Afcom said.

The data control shift supervisor's average national salary was $1,652, with a projected increase of 8.0% for 1983. Tape librarians made $1,182/mo on the average and will get a 7.6% increase, Afcom reported. Senior control clerks earned $1,329/mo nationally, while control clerks earned $1,101/mo representing a 17.1% increase in pay. These groups in the survey have '83 increase projections listed at 7.2% and 7.4%, respectively.

Data Entry Group

The final Afcom category surveyed was data entry. Managers in this operations area had a 15.5% jump in average national salary and posted a figure of $1,723. Their strongest area is the West where a $1,931/mo average was reported. The 1983 expectation based on the survey and reported by Afcom is an 8.2% increase.

Data entry shift supervisors made $1,484/mo on the average and are expected by Afcom to increase that number by 6.8% next year. Highest earnings came out of the West for this group with a $1,630 average. Senior operators were also strong in the West with a $1,310 average salary there. The national average for this group was $1,236. In addition, 1983 increases should be near 7.9%, Afcom said.

The salaries of key-to-disk and keypunch operators showed a 13.7% increase over 1982 with best figures coming out of the Midwest at averages of $1,076 and $1,089, respectively. The national average monthly figures were listed at $1,016 and $1,019, respectively.

Trends Predicted to Impact Software in '83

(Continued from Page 1)

ation of Computing Machinery, claimed the traditional reliance on structured languages, such as Cobol, is diminishing.

"There is an increasing recognition that third-generation languages are inadequate to comply with the enormous amount of software that has to be written. There is going to be a greater demand for application programmers who have developed skills in higher level languages. As soon as large companies recognize the value of these languages, I think we will see a great shift toward them and away from traditional software," Costello asserted.

A major development giving impetus to such a movement is the introduction of the information center concept and the growth of office automation facilities.

Orval Edwards, manager of development environments at Transaction Technology, Inc., a subsidiary of Citicorp, argued: "In the future, there will be a greater need for structured design skills rather than structured programming skills. Knowledge of data communications, local-area networks and microprocessor technology is going to be very important."

The rise of the information center, the industry observers said, will force programmers and analysts to have a far greater knowledge of the user departments with which they work. Costello maintained there will be a growing need for software specialists to possess data dictionary skills.

But several others warned that the entire information center concept was in danger of being mismanaged by MIS executives.

"There are two different professional types emerging in DP. There is the MBA type who works with the end user, typically an analyst or internal consultant. Then there are the programmers and people who carry out the mundane, unglamorous maintenance tasks. A rift has grown up between the two, leading in some cases to severe communication and management problems," explained Charles Milbourne, applications consultant at Time-Sharing Applications and Consulting Services, Encino, Calif.

MIS departments, Epner added, still do not know how to work with first-time users in the information center. "They are starting to see the beginning of an end-user revolt. The end user is going to outside parties to provide him with services. As this revolt becomes more obvious to MIS managers, they will wake up and start providing support. Until that happens, the information center is not going to serve the purpose for which it was set up, namely to act as an information utility for the company," Epner said.

Specialists in application software, Costello said, will need to get involved with information resource management, fourth-generation languages and data dictionary systems to be able to develop rapidly solid-state applications with a minimum of bugs. The system software specialist, on the other hand, will need to be immersed in data base technology, telecommunications and distributed processing skills, he maintained.

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Revamps Department

Manager Cuts Maintenance Time by 70%

By Jeffry Beeler
CW West Coast Bureau

SAN DIEGO — When Ralph Cook joined the San Diego County Department of Education as DP director about eight years ago, his programmers devoted practically all their time maintaining old programs rather than developing new ones.

"We were about as close to being an 100%-maintenance, 0%-development shop as you can get," the department's DP director recalled.

Even in comparison with the problems at most other commercial information processing centers, where the creation of new systems often accounts for only 10% to 30% of the total programming effort, the maintenance burden at Cook's department was uncommonly heavy.

But today, maintenance requirements no longer rank among his organization's most pressing DP concerns. In striking contrast to many other central computing staffs, Cook's systems personnel allocate at most only 25% to 30% of their total programming time to fixing and updating existing software. Most of the remaining 70% to 75% is channeled into the development of new applications.

For the Department of Education's end users, the computing center's drastic reduction in maintenance demands has meant a sharp upturn in the installation of new automated services. The users have already received new financial accounting and student-information systems, both of which previously existed in only the most rudimentary form. By the end of the current quarter, Cook's staff expects to expand the student-information system even further with the addition of 70 to 100 new user terminals.

Structured Methodology

The startling reduction in the data center's program-maintenance load has resulted primarily from Cook's decision six years ago to convert his organization to structured design and programming techniques.

During his first two years as the Department of Education's DP director, Cook was so preoccupied with his organization's upgrade to a new mainframe that he was unable to devote much energy to the data center's maintenance woes,

But in 1977, after the mainframe conversion was completed, he shifted his attention to the problem of increasing his staff's applications-development activities.

Toward that end, Cook arranged to take a two-week course in structured methodology from Danville, Calif.-based DP consultant Gopal Kapur. The DP director then began putting his newly acquired computing knowledge into practice and eventually presented his employees with an ultimatum: Either accept structured design and programming techniques as a way of professional life or seek employment elsewhere. Cook's demand met with only one dissenting opinion.

Since then, the Department of Education's central computing organization has revamped its applications-development procedures to conform to certain widely accepted industry standards. In essence, the data center's management and staff have broken the systems design and programming process into several readily identifiable phases, including specification review, function review, hierarchical diagramming, pseudo code preparation, compile code writing and testing.

At the end of each development step, Cook requires all participating staff members to submit their work to a structured walk-through. During specification and function review, for example, walk-through participants include nontechnical end users as well as system analysts, programmers and project managers.

But Cook has done much more during his eight-year reign as the Department of Education's DP director than merely introduce his data center staff to structured programming procedures. He has also instituted a program of ongoing DP training.

"When I first arrived here on the scene during the mid-1970s, [our computing department] didn't have a nickel in its budget for training," Cook recalled. "Now, we consider training our single most important expense item. We're willing to cut anywhere in the budget but there."

Ralph Cook

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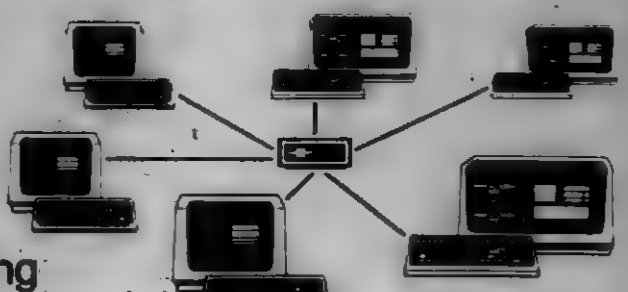

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Survey Finds Data Administration Flourishing

By Lois Paul
CW Staff

BOSTON — Data administration functions are alive and apparently functioning successfully in nearly half of 60 Fortune 1000 firms surveyed recently, but it is difficult to determine exactly what is responsible for their success.

This is one of the findings of Beverly Kahn, an assistant professor of management information systems at Boston University, who conducted a survey of a cross section of large firms.

To learn what was going on in the data administration and data base administration areas, Kahn surveyed 60 firms in the later part of 1982, the bulk of which were in the top 300 of the Fortune 1000. The surveys were targeted toward the data administrator or chief information officer of the organization.

She found that although the majority of the respondents reported that they were at least partially successful in their data administration efforts, it was difficult to determine what they were successful at doing. "I looked at what they had improved and they hadn't improved very much of anything," Kahn said.

Evaluating Effectiveness

The survey asked respondents to evaluate the effectiveness with which a number of data-management-related activities are accomplished in their organizations, such as promoting data sharing and controlling redundancy. Of the 17 activities listed, only maintaining procedures for data restoration and maintaining data integrity were listed by more than 50% of the respondents, according to Kahn.

TYPE OF DA FUNCTION	DBMS EXISTS	USE OF DBMS*			
		1%-25%	26%-50%	51%-70%	71%-100%
DA and DBA	92.3%	37%	29%	20%	12%
DBA Only	100	54	23	23	0
No Formal Function	57.2	63	25	12	0
All	84.6	47	27	20	6

*Only includes organizations with a DBMS based on the percentage of DBMS-based applications.

Source: Boston University

Figure 1

TYPE OF DA FUNCTION	COMPUTERIZED DDS EXISTS	USE OF COMPUTERIZED DDS**		
		1%-25%	26%-50%	51%-70%
DA and DBA	72%	62%	24%	14%
DBA Only	85	91	0	9
No Formal Function*	17	—	—	—
All	62	72	17	11

*Sample size is too small for usage information to be meaningful.
**Of organizations with a DDS.

Source: Boston University

Figure 2

Another question asked how the establishment of a data administration function affected activities such as data sharing and documentation about data. Sixty-eight percent of the respondents indicated that documentation about data was improved. They also reported that the data administration improved consistent information and somewhat improved data sharing. "There was no consensus on the improvement of termination of future requirements or user satisfaction," she said, noting that the same things seemed to be improved within the responding organizations whether they had a data administration and a data base administration or not.

"They weren't effective in promoting data sharing. One of the things that surprised me is they didn't feel they were effective in controlling redundancy. Only 23% felt they were somewhat effective, and 39% felt they weren't effective at all," Kahn said.

"They say that maintaining data integrity is important. Then if you ask them if they have ways of defining integrity constraints or rules for data values, they don't say they do that. So I wonder what they do and how they do it," she added. "The only thing that came out overwhelmingly was procedures for data retention [85%]." The next highest category of data administration/data base administration effectiveness, according to the respondents, was consulting (approximately 40%).

In looking at the changes that have taken place in the data administration function, Kahn focused on data-management-related standards. She was surprised by the relative lack of standards that she found even within organizations with data administration/data base administration functions.

"The interesting thing is that if you are looking at the sample as a whole, the only type of standards that overwhelmingly exist are in program and system documentation. Ninety percent of the companies had documentation standards and recovery standards for disasters," she said, noting that only 60% of the total sample had system life-cycle standards.

Standards Enforced

"If they do exist they seem to be enforced," Kahn added. "So people don't have standards for standards' sake. Or the corollary is that they are afraid to admit that they have standards and don't enforce them."

In terms of the data administration/data base administration function, Kahn learned that this usually has come into being because there was some disaster. "Usually it occured because the first time they tried to integrate something — and the integrated system was to supply top management with information — they found out the integration was impossible," she said.

In most organizations, she said, the data base management system (DBMS) came first, the data base administration function second and the data dictionary system third. She said this followed naturally, because first the software would be installed and when the firm saw this did not solve all of their problems, they would establish an organizational function to work with it. The data dictionary would be added to help use the DBMS. About 40% of the firms she surveyed brought in the data administration function last.

Kahn is using SPSS, Inc.'s Statistical Package for the Social Sciences package, run on Boston University's IBM 3081, for statistical tabulation of her results.

DBMS Plentiful But Not Used: Survey

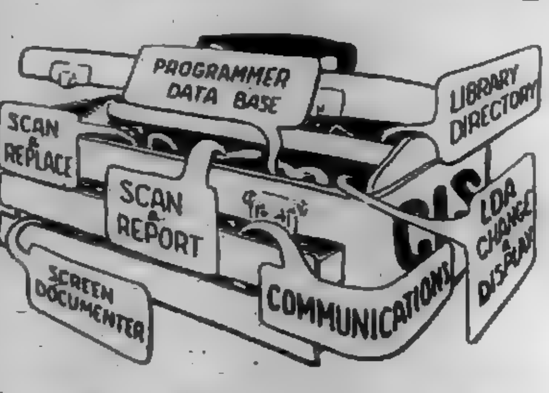
BOSTON — Although the majority (84%) of 60 firms in a recent survey reported having more than one data base management system (DBMS), they reportedly are not making much use of this software.

"Data base systems are not used; they just exist," according to the surveyer, Beverly Kahn, an assistant professor of management information systems at Boston University. She also found that the firms' planned use of their DBMS packages was not very high. "They were using DBMS, but not necessarily on integrated data," she said.

In contrast, the planned use of data dictionary systems (DDS) was high, she noted. "There is more of a trend toward the dictionaries. I asked what they planned to use and what they felt they should use, and everyone seems to be not as unhappy with their use of DBMS as they were unhappy with their use of DDS."

"People are using primarily conventional files still, regardless of what is going on," Kahn said, noting that 55% of the respondents reported that they are using conventional files either primarily or exclusively. "Hardly anyone is using primarily integrated data bases. No one said they were using totally integrated data bases."

Kahn said a major surprise in this section of the study was the types of DBMS packages she found in multiple-DBMS shops. "When you expect people to have more than one [DBMS], you expect them to have some type of procedural workhorse," she said, citing the combination of IBM's IMS and either IBM's Query by Example or Structured Query Language. Instead, she found combinations such as two hierarchical systems and two Codasyl-type systems in the same shop.



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Software Listing Now Available

DEDHAM, Mass. — The 1983 edition of *Design Compudata*, a software and systems directory, is now available.

The new edition reportedly shows an increase in packages specifically designed for architectural and engineering firms.

Compared with last year's edition, the directory lists fives times as much software for Apple Computer, Inc. equipment, three times as many packages for Radio Shack and Prime Computer, Inc. hardware and twice the number of packages for IBM and Digital Equipment Corp. units, the vendor said.

Design Compudata costs $95, plus $3 for postage and handling.

The edition is available from Frank A. Stasiowski, Publisher, 45 Van Brunt Ave., Dedham, Mass. 02026.

Study Finds CIO Ranks High in Corporation

BOSTON — The Chief Information Officer has finally achieved a level of credibility in most organizations, according to a recent report.

A survey of 60 Fortune 1000 firms by Beverly Kahn, assistant professor of management information systems (MIS) at Boston University, found that, in most cases, the chief information officer was "way up there in the organizational hierarchy."

"In your very large Fortune 200 companies, they were two levels below the president, and in the next size group they were reporting to the president," she said.

In terms of centralization of the MIS function, 65% of the respondents said that 85% or more of MIS activities are largely centralized.

Operational control systems still dominated, with 69% of the organizations reporting they had 80% to 100% transaction-oriented production systems. Kahn also found that 92% of the sample reported they had less than 10% decision support system functions within their MIS departments.

Taking a look at the specific industries represented by the respondents, Kahn was surprised to note that the electronics and electrical industry appeared to be the most progressive in terms of the MIS function.

For example, this group had more data administrators than any other industry as a whole, according to Kahn.

The majority (56%) of the respondents indicated that they have formal MIS planning committees and, of these, only 27% felt that these were really influential.

The only person who overwhelmingly was reported as being involved in the planning committee was the chief information officer.

CW Photo by P. Gilln

Beverly Kahn

PVI Users Group To Meet March 9

BOULDER, Colo. — Precision Visuals, Inc. (PVI) will hold its 1983 users group meeting at the Hilton Harvest House Hotel here March 9-11. The company will also hold a device-independent graphics course March 7-8.

The three-day conference reportedly will include user presentations, explanations by members of the American National Standards Institute Committee on current graphics standards activities and panel discussions on graphics software and hardware trends. Other sessions will include a panel discussion on enhancements and additions to PVI software and a review of graphics hardware for which PVI has written device-driver software.

Also scheduled are several workshops and a demonstration room that reportedly will feature a broad range of graphics devices. Representatives from several major graphics firms are expected to participate in the workshops, a spokesman said.

Conference registration is $100/person; $75/person for additional attendees from the same firm. The fee for the device-independent graphics course is $295. Attendance at both costs $325; $295 for additional attendees from the same firm. Final registration is due Feb. 21. More information is available from Brenda Honeyman, PVI, 6260 Lookout Road, Boulder, Colo. 80301.

Software Grants Target Farming

LINCOLN, Neb. — The Agdisk Educational Foundation is offering grants of microcomputer software totaling $180,000 to help further computer literacy in agriculture.

Agricultural educators, extension agents and industry leaders who work with computerized agricultural operations are encouraged to apply for a grant. As many as 500 grants of microcomputer software, ranging in value from $140 to $1,500, may be awarded.

Special consideration will be given to applicants involved in the following educational areas: farm accounting, budgeting or enterprise analysis, farm grain/livestock profit projections, commodity market analysis, general farm financial management, machinery management, corn and soybean or swine management and record-keeping for swine, crop, dairy or cattle operations.

Applications are available from Scott T. Robertson, General Counsel, Agdisk Educational Foundation, Harris Terminal Systems, 624 Peach St., Lincoln, Neb. 68501.

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House Report Targets Telecommunications

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — A recent report issued by a House of Representatives Republican task force on regulatory reform puts new telecommunications legislation near the top of its proposed agenda for the incoming 98th Congress. The report also takes a stand on some controversial issues.

For example, it endorses putting intrastate long-distance services, now controlled by state regulatory agencies, under the Federal Communications Commission's (FCC) authority. It also suggests that companies without monopoly power should be allowed to offer international communications services free of regulation.

The FCC, although praised for a number of actions, was criticized for giving half of the recently created cellular mobile radio spectrum to telephone carriers. This action allegedly will reduce the chance of cellular radio becoming a competitive alternative to local telephone carrier facilities. Meanwhile, the commission's order that AT&T must file a Section 214 application for Basic Packet Switching Service could lead to unnecessary regulation, the task force added.

Entitled "Regulatory Reform: The Quiet Revolution," the report, among other recommendations, suggests that Congress prohibit the U.S. Postal Service from "providing competitive service such as [Electronic Computer-Originated Mail]."

A spokesman for Rep. Jerry Lewis (R-Calif.), chairman of the task force, said the report has aroused "great interest" among Republicans in Congress, indicating there is a good chance at least some of the recommendations will be converted into proposed legislation.

FCC Wants More Info On Divestiture Effect

WASHINGTON, D.C. — Before AT&T can divest 22 of its operating companies early next year, the Federal Communications Commission (FCC) wants the company to explain the effect of the divestiture on the introduction of new services.

Under a commission order issued earlier this month, the phone company also must describe any "technical changes" resulting from divestiture; what cost increases are anticipated and how they will be allocated; how the "equal access" provision of the settlement agreement will be applied to AT&T's Long Lines Division and competing long-distance carriers; and the way the "central staff organization" — to be run by seven regional holding companies that will own the 22 Bell operating companies after divestiture — will relate to the latter companies and to other carriers.

The FCC's request stems from the 1934 Communications Act, which states that before regulated communications facilities can change hands, the FCC must determine that the transfer is in the public interest.

Because of the number of facilities involved in the upcoming divestiture, there is some question whether it can be completed by Jan. 1, 1984, the date on which the phone company wants divestiture to occur.

SPCC Files Appeal Of AT&T Suit Result

WASHINGTON, D.C. — Southern Pacific Communications Co. (SPCC) has taken its first antitrust suit against AT&T to the U.S. Court of Appeals here. It has also filed a second suit in San Francisco.

The latter case involves AT&T's alleged attempts to prevent SPCC from marketing Sprint, a competitor to the phone company's long-distance dial-up telephone service.

The first case revolves around charges that AT&T refused to interconnect its local exchange facilities with SPCC private lines before 1979. Last month, Federal District Court Judge Charles Richey absolved AT&T of all charges. But Richey's verdict clashes sharply with the one rendered last summer by a federal district court in Chicago. That case, filed by MCI Communications Corp., involved many of the same complaints at issue in the SPCC antitrust suit. The Chicago jury decided that AT&T had committed multiple violations of the Sherman Antitrust Act and awarded MCI record damages of $1.8 billion plus interest.

Office Systems Theme of Book

BETHESDA, Md. — The International Micrographic Congress (IMC) is offering *Emerging Office Systems*, a 433-page book on strategies for developing an office system.

The book addresses the pitfalls involved with merging information technologies. A special emphasis is placed on the human and organizational factors involved in implementing an office system.

Included are case studies on why some plans fail and how technologies are misused, IMC said.

The book, designated IMC-121, costs $28 ($36 airmail). It can be ordered from IMC through P.O. Box 34404, Bethesda, Md. 20817.

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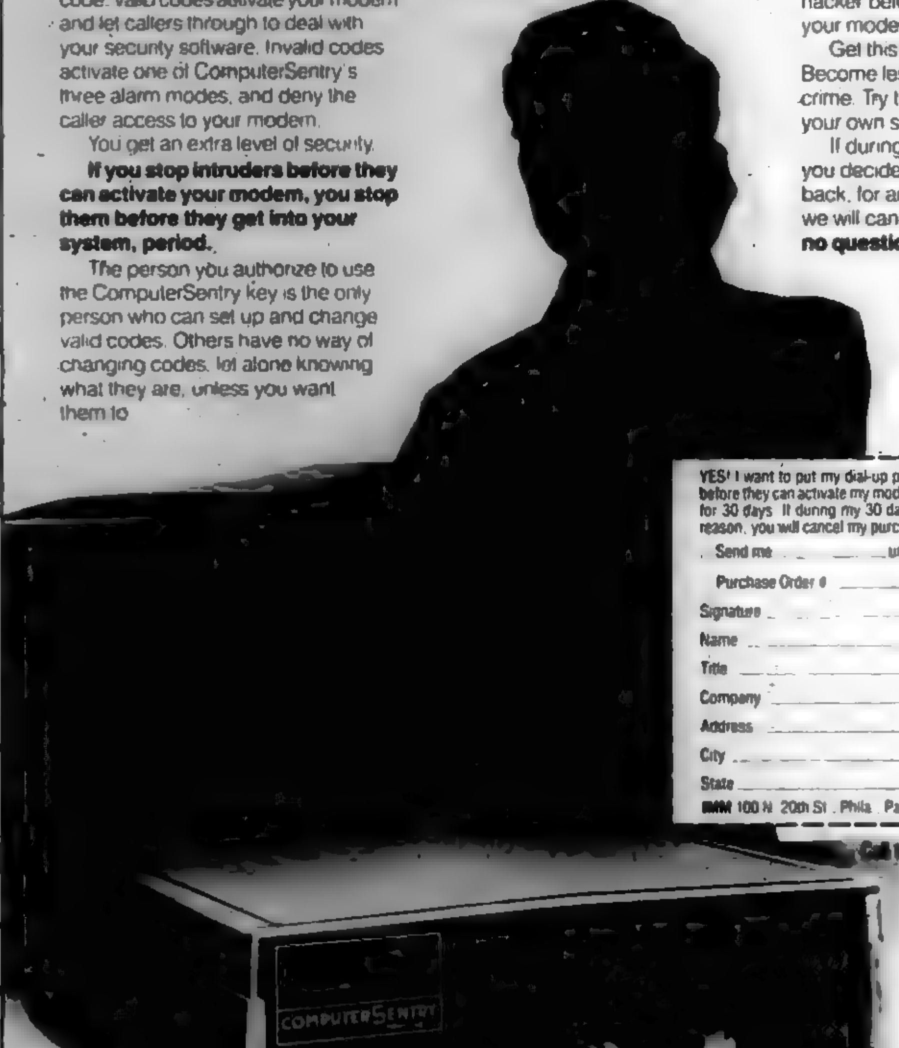

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Salary Ranges $30,000 to $35,000

Poll Finds QA Analysts Enthusiastic Over Jobs

By Susan Blakeney
CW Staff

ORLANDO, Fla. — The average salary range for data processing quality assurance (QA) analysts is $30,000 to $35,000.

Most QA professionals are enthusiastic about the challenge and opportunity for advancement associated with their jobs.

QA slots are filled almost exclusively by data processing personnel.

Those are the findings of a recent survey conducted by the Quality Assurance Institute, which polled 92 organizations in different businesses around the country.

The survey also found that the average QA function has been organized for less than two years. While this average did not accurately reflect the chronological age of the QA function in computer companies per se (the majority of which said they have had QA for three or more years), it did reveal the trend in the other industries polled, which spanned financial houses, government and education, regulated industries, manufacturing and service companies.

The bulk of the QA staff reports to data processing management other than the manager of systems and programming or computer operations, the survey said. Independence from systems development and operations were cited as important in making the function successful, and most of the QA functions draw their authority from a management directive clearly stating its responsibilities.

Main Function

The main function of QA groups appears to be conducting reviews of applications during the development cycle (see story below). However, in approximately two-thirds of the surveyed organizations, the QA group did not have the authority to halt application development projects.

Roughly 80% of all QA staff is assigned permanently to the DP QA group, the survey found. On the other hand, only one-third of the QA reviews are conducted exclusively by the QA staff. Close to 50% are performed by a combination of a review team, internal auditors and QA staff personnel.

During the review of an application system, the survey revealed, about 33% of the QA staffers conducted their review by probing, 25% used QA-developed checklists, 15% relied on checklists provided in purchased life cycle methodologies and less than 10% used software during the review. The remainder overlapped on the above.

Moreover, one-third of the QA groups were involved in testing program code, and of those who tested, more than two-thirds prepared their own criteria.

Some of the more notable practices used in fulfilling the QA responsibilities are quality circles, peer review, written reports, compliance to standards, professional judgement, mathematical methods.

Average Staffing

In the industries surveyed, the average staffing was approximately one QA analyst for each 40 systems analysts/programmers. The average computer system is apparently subject to three reviews, but in approximately 20% of the companies surveyed; seven or more reviews occur. The average QA analysts works with three or less projects at any one time, the survey reported.

According to the survey, the source of QA personnel is, in descending order of frequency: systems analysts, programmers, computer operations/control personnel. Some 80% of QA managers have six or more years of DP experience, and over 50% of the QA staff has six or more years' DP experience. The average tenure of a QA member is two years or less.

Over 80% of QA personnel have a four-year college degree, while few have any type of certification, according to the poll. The most probable promotion path for a QA manager in more than 50% of the organizations queried was into DP management.

Quality assurance requires skills other than DP, according to survey respondents, and these qualities include interpersonal skills, verbal and written communication competence, time management, knowledge of the business, statistics and accounting experience.

A copy of the survey report is available for $25 from the Quality Assurance Institute at 9222 Bay Point Drive, Orlando, Fla. 32811.

Number of Full-Time Professionals in DP Quality Assurance Function
(By Industry)

Industry Number	DP/Hardware Software	Financial	Government Education	Regulated Industries	Manufacturing Extraction	Trade/ Service/ Leisure
One or Less	18.20%	11.10%	33.30%	19%	47.80%	41.70%
Two to Five	63.60	66.70	50	66.70	43.50	41.70
Six to Ten	9.10	11.10	0	4.80	0	0
Eleven to Fifteen	0	5.50	16.70	0	4.30	8.30
Sixteen or More	9.10	5.50	0	9.50	4.30	8.30
Total	100%	100%	100%	100%	100%	100%
Sample Size	11	18	6	21	23	12

Source: Quality Assurance Institute

Figure 1

Sources for Filling Quality Assurance Vacancies
(By Industry)

	DP/Hardware Software	Financial	Government Education	Regulated Industries	Manufacturing Extraction	Trade/ Service/ Leisure
System Analysts	35.30%	32.40%	35.70%	50%	42.40%	50%
Programmers	29.40	16.20	28.60	18.80	18.20	27.80
Operations/Control	17.60	18.90	14.30	15.60	18.20	16.70
Users	0	5.40	7.10	9.40	3	0
Auditors	0	10.80	0	6.30	3	5.60
Others	17.60	16.20	14.30	0	15.20	0
Total	100%	100%	100%	100%	100%	100%
Total Responses	17	37	14	32	33	18

Source: Quality Assurance Institute

Figure 2

Best Sources of Training for Quality Assurance
(By Industry)

	DP/Hardware Software	Financial	Government Education	Regulated Industries	Manufacturing Extraction	Trade/ Service/ Leisure
Seminar/Workshop	22.20%	33.30%	25%	37.90%	31.40%	11.10%
Conference/Symposium	16.70	18.50	25	20.70	15.70	16.70
Publications	16.70	7.40	12.50	3.40	17.60	22.20
On-Job Training/In House	27.80	22.20	37.50	20.70	19.60	22.20
Other	16.70	18.50	0	17.20	15.70	27.80
Total	100%	100%	100%	100%	100%	100%
Total Responses	18	27	8	29	51	18

Source: Quality Assurance Institute

Figure 3

QA's Main Role Found in System Certification

ORLANDO, Fla. — While the responsibilities of quality assurance (QA) groups vary significantly from industry to industry, the main duty, as well as the most time-consuming one, is certifying systems prior to production status, according to a survey conducted by the Quality Assurance Institute here.

Other quality assurance functions include reviewing and certifying development and documentation; enforcing DP standards; overseeing program code change; reporting hardware/software problems; managing changes to applications; monitoring adherence to security measures; reviewing system design; and assuring system and programming practices are followed.

The cost of a QA review was found to fall between 2% and 5% of the total developmental effort in about 50% of the organizations polled. Of the remainder, half are below 2% and half are above 6%.

The survey indicated that internal audit is generally supportive of the QA function, and in about 10% of the organizations it actually participates on reviews.

The most popular methods of enforcing quality in application systems according to the survey are:

- Control of the production library.
- Control of the source library.
- Control of the project scheduling system.

QA is also beginning to develop tools to assess quality. Approximately 20% of those surveyed use risk analysis, 20% use consultants and about 10% use scoring as a QA tool, the survey found.

Relational Software Renames Self, Boosts Oracle

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — Relational Software, Inc. has renamed itelf Oracle Corp. and has replaced Oracle Version 2.3 with Version 3.0, which is billed as the first mainframe-oriented data base management system (DBMS) to be transported to the microcomputer arena.

Both the company name change and the product enhancement were announced on Jan. 26, during the joint Automated Office Expo and Software Expo West shows here.

Version 3.0 already operates with all IBM mainframes running under VM/CMS and all members of the Digital Equipment Corp. PDP-11 and VAX minicomputer families, an Oracle official said.

The latest Oracle release also reportedly accommodates the Data General Corp. Eclipse series minis (both the 16- and 32-bit machines) and all Motorola Semiconductor Products, Inc. MC68000-based microcomputers running the Bell Laboratories Unix operating system.

In addition, Version 3.0 will soon be enhanced even further to support IBM mainframes running under MVS, all micros built around the Intel Corp. 8086 and MC68000-based products using operating systems other than Unix, the company official explained.

With Version 2.3, Oracle's support was restricted to the DEC PDP-11 and VAX series members.

The resulting expansion of Oracle's CPU support means that users can now link their microcomputers to central mainframes and thus gain easy access to corporate data bases and programs, the official explained. But at the same time, Version 3.0 can also be run on microcomputers in a strictly stand-alone mode if users choose to apply the relational DBMS in that way.

Compatibility with SQL/DS

Oracle credits Version 3.0 with providing full upward compatibility with SQL/DS, IBM's relational DBMS.

And the latest Oracle release comes with a package of software development productivity tools that include a nonprocedural application generator, nonprocedural report writer and integrated data dictionary, the official said.

Written in the C programming language, only 30 of the DBMS' 2,000 modules need to be changed to transport the product from a mainframe to a typical 16- or 32-bit processor, the official continued.

Like its predecessor, Version 3.0 will also be sold directly to end users, the official added.

The enhanced Oracle DBMS costs $48,000 to $96,000 for IBM mainframes, $24,000 to $48,000 for the VAX series systems, $12,000 to $48,000 for the PDP-11 family members and $600 to $2,000 for MC68000-based microcomputers.

The system is available immediately from Oracle at 3000 Sand Hill Road, Menlo Park, Calif. 94025.

Deltak Course Covers IMS/VS

NAPERVILLE, Ill. — Deltak, Inc. has announced "IMS/VS Data Base Concepts and Facilities," a course for applications programmers and programmer/analysts who need to learn more about IBM's DL/1 language for the IBM IMS/VS data base management system. The course is a multimedia course consisting of audio and video tapes as well as text.

The course has no formal prerequisites other than an understanding of basic programming concepts. The course is aimed at familiarizing students with the IMS data base and data communications terminology. Students will be able to discriminate between different views of IMS data and properly arrange events in IMS message processing, the firm said.

The course costs $1,750. It can also be leased for $50/mo to $125/mo, depending on volume. Deltak is located at 1751 W. Diehl Road, Naperville, Ill. 60566.

AMS Meet Set For May 15-18

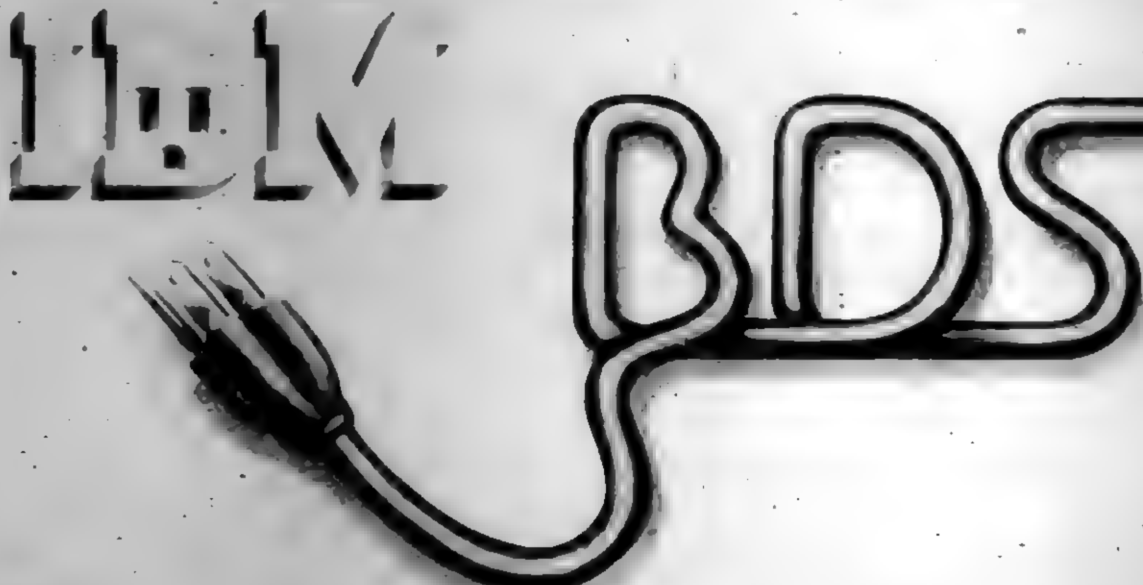
TORONTO — Japan's soaring productivity rate will be compared with the lagging U.S. rate at the 64th international conference of the Administrative Management Society (AMS) here May 15-18.

Dr. William G. Ouchi, management professor at the University of California at Los Angeles' Graduate School of Business, and B. Bruce-Briggs of the Hudson Institute will be the featured speakers at the AMS conference.

The conference is to be held at the Toronto Hilton Harbour Castle Hotel and will deal with such topics as increasing white-collar productivity, implementing automated office systems and managing in tough economic times.

For the full conference, members will pay $250 and nonmembers, $300.

For one day, members pay $165 and nonmembers pay $185. AMS is located at 2360 Maryland Road, Willow Grove, Pa. 19090.



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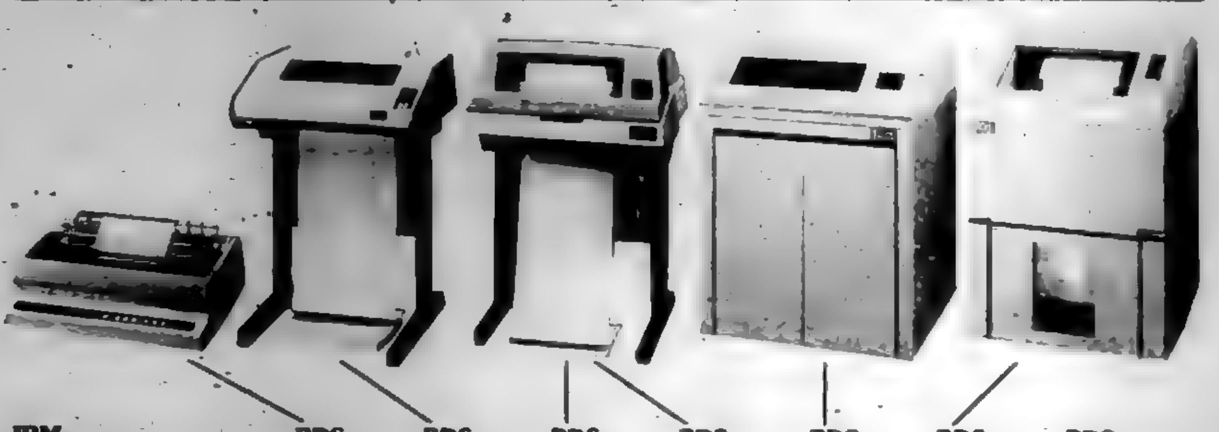

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Futurist Cites Japan's Diligence

U.S. Not Alone in Software Expertise: Futurist

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — The widespread belief that Americans hold a significant edge over the Japanese in software expertise came under fire here last week at a high-technology trade show.

Author and industry futurist Charles P. Lecht disputed the comforting notion that Japan, despite its acknowledged leadership in hardware, still trails the U.S. badly in its ability to produce quality programs.

"The Japanese aren't behind us in programming," Lecht said during his keynote address last week at the joint Automated Office Expo and Software Expo West shows. "Software development is hard everywhere, but the Japanese are the only ones who are saying so."

Lecht — who heads his own New York-based consulting company, Lecht Sciences, Inc. — also challenged the popular American view that Japan acquired most of its current computing expertise by copying or swiping technology from the U.S.

"Japan's success in the computer industry is due, not to theft or imitation of American technology, but to diligence, hard work and honesty," he said. "Japan's success was created by the Japanese themselves, who have dignified the Protestant ethic better than any Protestant ever has."

As if to underscore his point, Lecht cited recent reports that Japanese electronics vendor Nippon Electric Co. plans to shoot a fully automated chip-producing factory into Earth orbit by 1987. The satellite, which will be manned entirely by robots, will exploit the weightlessness and near-vacuum of outer space to make semiconductors with exotic electronic properties that would be impossible to reproduce on the planet's surface.

Announcement of the proposed chip-manufacturing satellite has received heavy press coverage overseas, but for unknown reasons it has yet to be widely publicized in the U.S., he said.

In related comments, Lecht rejected the common U.S. perception that the Soviet Union, like Japan, depends heavily on theft for much of its technological advancement. "The Soviets neither want nor need our technology," he said. "Their only interest in it is to find out how our warheads work."

Lecht Predicts 'Peanut' Micro

SAN FRANCISCO — A forthcoming announcement of a very low-cost IBM microcomputer was among possibilities posed by keynoter Charles Lecht during the Automated Office Expo and Software Expo West here.

Reportedly code named "Peanut," the micro is expected to sell for about $800.

Likely to make its debut sometime during the "very near future," the system will be built around a microprocessor "so small that you won't be able to take it home with you because you wouldn't be able to find it on the shelf," he said.

Lecht also predicted the eventual accretion of the U.S.' existing DP resources into a dozen or so extremely massive computing systems, each of which will be associated with its own set of nested communications networks.

The emergence of these mammoth computing systems in no way will mean the end of today's discrete data centers, which will continue to exist in their current form for some time to come.

Although data centers will continue to do a portion of their processing locally, primarily through function-specific terminals, most of their computing services will come to them from the outside through a massive hierarchy of networks, Lecht predicted.

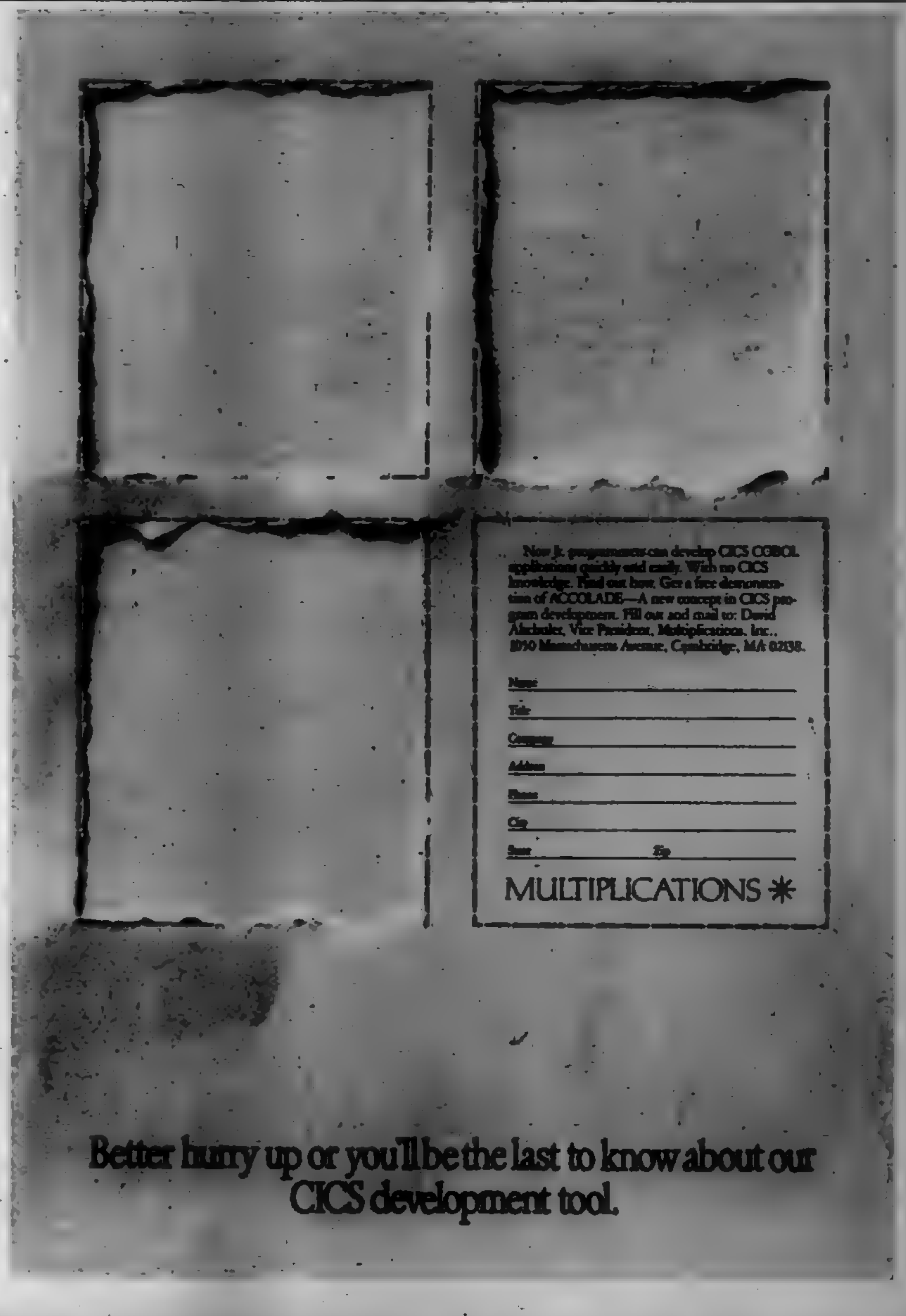
Within five years, he added, most of the companies now involved in supplying DP products or services will cease to exist in their current form. Instead, they will either be absorbed by large national networks or will form independent networks of their own.

Insurers' Booklet Reissued for DPers

DALLAS — International Risk Management Institute, Inc. has announced the second edition of its booklet to aid data processing professionals in evaluating the soundness of their insurance programs.

Entitled "An Insurance Buyers' Checklist for Data Processors," the publication sets forth guidelines, questions to be asked of the insurance agent and points to consider in determining whether an insurance program is properly structured. A risk control checklist aids in determining insurable values for DP equipment.

The booklet costs $15 from the vendor at Suite 208, Building III, 10300 N. Central Expwy., Dallas,



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Bank Users Group Gets Apple's Micro Outlook

By Bruce Hoard
CW Staff

NEW YORK — Members of the Chase Manhattan Bank Personal Computer Users Group listened intently as Apple Computer, Inc.'s John Couch detailed his firm's outlook on personal computing, one of a number of talks held at the group's quarterly meetings.

While not all of the group's members have personal computers, and some know very little about them, all of them share a common interest in micros, according to Irving M. Brown, manager of Chase's three-person Microcomputer Support Group and a driving force behind the users group.

Established last June, the users group — which now boasts some 200 members — has provided a focal point for the burgeoning use of personal computers at one of the world's largest banks.

It was founded by the bank's Corporate Systems Division after the division detected a need and there was a "groundswell" of demand from the Chase community, Brown said. Corporate Systems is responsible for the initiation and support of information technology strategies.

CW Photo by B. Hoard

Irving M. Brown

Brown joined Chase Manhattan nine months ago, bringing with him 18 years of diverse DP experience ranging from programming to consulting. "I came here with the idea of heading this support team and taking advantage of my background to make sure micros would not be in isolation," he said following the meeting.

The users group is guided by Brown and Ralph Verdino, manager of End User Services within the Microcomputer Support Group. Together, they preside over a steering council and a series of special interest groups covering such topics as micro-mainframe interfacing, data base management systems, graphics and local-area networks.

The group also acts as a clearinghouse for hardware and software swaps. If one member has outgrown his system, he can pass it on to another who can still make good use of it. Users may also borrow systems and peripherals.

Brown said the typical users group member falls into one of two categories; systems profesional or non-DP professional end user. "We're not strictly a DP organization," he declared. "Our thrust is very heavily toward the non-DP user." The highest ranking bank official members are from the division executive level, he added.

The personal computer acquisition process at Chase Manhattan is illustrative of the bank's approach to micros. While other large corporations have chosen to establish information centers and in-house computer stores, Brown's three-person Microcomputer Support Group — consisting of himself, Verdino and aid Diane Steiglianese — takes a slightly more informal approach.

All micro requests are funneled through them. If there is a legitimate need, Brown will help the new user configure a system and recommend that the bank's Contracts Administration Department provide it. The cost is charged back to the employee's department.

As Brown noted, most requests lead to acquisitions, and usually quick ones. "It is governed to an extent by how knowledgeable the user is and how well defined his business requirements are," he explained.

There are currently about 300 personal computers in use at Chase, he said, adding most are from Apple and IBM with a smattering from such other vendors as Digital Equipment Corp. and Vector Graphics, Inc. He does not want to add other machines unless they fulfill a specific, needed business function.

The issues that concern user group members can also be broken down into two categories. The "strategic" area includes such problems as compatibility and communications, while the second area deals more with daily problems such as how to perform specific tasks, he said. The most commonly used application is the electronic spreadsheet.

The micro-to-mainframe link has been a hot topic among many personal computer users lately. Brown referred to it as "a growing area," adding, "We definitely want to move into that much more than we have." He said it has come into prominence as the first generation of stand-alone personal computers has given way to the more project-oriented second generation.

Apple's Couch Offers Glimpse Of Lisa, Macintosh Offerings

NEW YORK — At last week's quarterly meeting here, members of the Chase Manhattan Bank Personal Computer Users Group were among the first to catch a glimpse of Apple Computer, Inc.'s future product plans.

John Couch, the vice-president and general manager of Apple's Personal Office Systems Division, talked about Lisa, the firm's recently announced [CW, Jan. 24] 16-bit microcomputer, and also discussed Macintosh, the putative and as yet unannounced successor to Lisa.

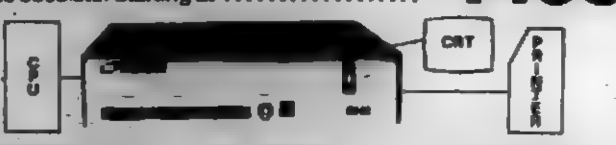
Couch said Apple expects 50% of its first-year Lisa sales to come from medium-size ($5 million to $120 million in annual sales) companies.

Fifty Lisas have been sent out to third-party software houses for business software development, he said, adding, "I would expect to see accounting software available within the year."

Apple is setting up 125 Lisa beta test sites this February. The sites are not being established to test Lisa's technical competence; the idea is to test Apple's ability to install and support a large number of the machines, Couch explained.

Turning to Macintosh, the vice-president said it will be less expensive and have less memory than Lisa. It will also lack the "software slots" that allow Lisa to facilitate third-party software packages, he added.

All of Apple's new products over the next five to 10 years will be "flavored" by the Lisa software architecture, Couch noted.



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Congressmen Suspicious

AT&T Squaring Off in BOC Detariffing Battle

By Phil Hirsch
CW Washington Bureau

WASHINGTON — A hot battle was brewing here last week over the detariffing of in-place terminal equipment leased or rented from the Bell operating companies.

AT&T wants this equipment detariffed before next Jan. 1, the planned date for divestiture of 22 Bell operating companies, claiming this plan would mean significant savings for users. But seven influential congressmen have sent a letter to the Federal Communications Commission (FCC) suggesting that AT&T's real interest is making a bundle for itself.

On Jan. 21, the phone company asked the FCC to let it add $6.6 billion to the capitalization of American Bell, Inc., AT&T's deregulated subsidiary. This money would buy the installed, "embedded" base of terminal customer premises equipment now owned by the Bell operating companies. AT&T's plan includes a timetable for transferring the embedded base to American Bell. Dimension, Horizon, Dataphone II and all other "stored program control" customer premises equipment would change hands between Aug. 1 and Dec. 31.

Key Argument

The phone company's key argument is that if the FCC detariffs customer premises equipment after divestiture, rather than before, the installed base will have to be transferred to AT&T rather than American Bell since the latter organization is allowed by the FCC's Second Computer Inquiry decision to offer only unregulated services. According to AT&T Vice-President James R. Billingsley, AT&T "would have to get tariffs for embedded customer premises equipment filed and approved in all 50 regulatory jurisdictions, as well as develop computer systems for billing and accounting under the differing requirements of these jurisdictions. Literally hundreds of millions of dollars would have to be spent."

The seven congressmen argued that "fast track" deregulation would "not permit sufficient time for development of adequate alternative sources of equipment" able to "provide a competitive check on AT&T's prices." In addition, AT&T could "capitalize on its dominance of the installed terminal equipment market and migrate current Bell customers to newer equipment — a strategy which several state public utility commissions have already recognized and opposed."

These comments were in a letter sent to FCC Chairman Mark Fowler Jan. 17. The signers included the chairman of the House of Representatives' Commerce Committee, Rep. John Dingell (D-Mich.); the chairman of the House Telecommunications Subcommittee, Tim Wirth (D-Colo.); and five other subcommittee Democrats — James Scheuer (N.Y.); Al Swift (Wash.); Edward J. Markey (Mass.); W.J. Tauzin (la.); and Henry A. Waxman (Calif.).

They favor procedures that "gradually remove embedded equipment from regulation," for example, "a policy of detariffing equipment, once it has been fully depreciated, or a time curtain set sufficiently far into the future to obviate our concerns."

AT&T has said that if its embedded customer premises equipment deregulation plan is implemented, "American Bell will limit increases in purchase prices for embedded consumer products to the percentage increase in the consumer price index, unless there are unforeseen cost increases." However, a spokeswoman for the Telecommunications Subcommittee pointed out that this guarantee does not include charges for maintenance or other terminal support.

Meet to Cover Software Costs

TORRANCE, Calif. — The Education Foundation of the Data Processing Management Association (EFDPMA) will sponsor a seminar, "Estimating Software Costs," at three locations: March 10-11 in Boston, March 14-15 in Washington, D.C., and March 28-29 in Orlando, Fla.

The program features Dr. Robert C. Tausworthe, software chief engineer of Deep Space Network Digital Systems and the former deputy software manager of the Galileo Project at National Aeronautics and Space Administration's Jet Propulsion Laboratory. He will offer guidelines for critically evaluating the existing methods and costs estimation models and for setting up an effective life-cycle cost information system.

Registration fees are $475 for nonmembers, $455 for association members and $410 for teams of three or more attendees from government, military or university facilities. More information is available from EFDPMA Seminars, Department ESC, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif, 90510.

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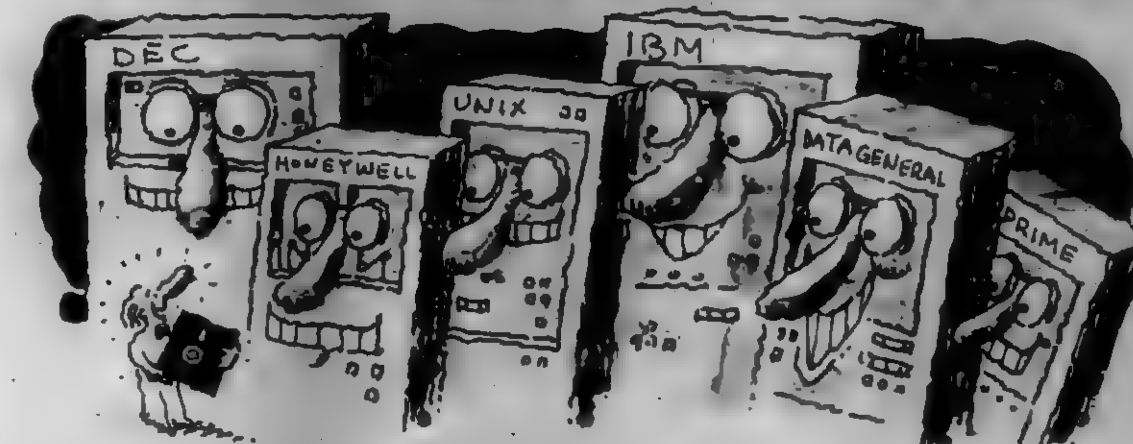

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AT&T Insists BPSS 'Basic,' Not 'Enhanced'

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Ma Bell struck back at her tormentors, insisting that despite what they say, Basic Packet Switching Service (BPSS) is "basic," rather than "enhanced," as those terms are defined in the Federal Communications Commission's Second Computer Inquiry Decision.

It is an important question for users because BPSS is part of the underpinning for AIS/Net 1000, the smart network service recently unveiled by American Bell, Inc., the phone company's deregulated subsidiary.

Just exactly when that service goes on the air will be determined partly by how soon the BPSS battle is settled.

Analysis

Also, if BPSS, as proposed by American Bell, is authorized by the FCC, there is at least a chance this will reduce competition among suppliers of enhanced — that is, computer-based communications processing and computer-based information processing — services.

The real issue in the BPSS battle is a matter of market position rather than semantics.

The Computer II decision states that if AT&T wants to offer an enhanced service, it must do so through a fully separated, deregulated subsidiary, such as American Bell. A "basic" service, however, can be offered by AT&T Long Lines, a regulated carrier.

Competitors fear that if the commission decides BPSS is basic, it will put them under a tremendous handicap, for then AT&T allegedly will be able to cross-subsidize the new offering with revenue earned from its long-distance telephone business and set a precedent for doing likewise with future smart network services.

If BPSS is found to be enhanced, AT&T's present plans for offering the new service and, possibly, AIS/Net 1000, will be delayed, giving the competitors more time to anchor themselves in the smart network market.

In its latest comment, AT&T insisted that most of the objections to BPSS are based on misreading the FCC's Computer II decision.

For example, GTE Telenet Communications Corp. had argued that BPSS is enhanced even though it supports a single end-to-end communications protocol, because that protocol "offers the user a range of protocol conversion features which are the very essence of 'enhanced' service."

AT&T's answer was that "the Second Computer Inquiry Decision did not restrict the complexity of protocols that can be supported by basic services. It simply held that a service is basic if customer data exits a carrier network on the same protocol it enters . . . BPSS conforms with this basic service definition."

Channel Service Unit

Another major objection to BPSS is that it requires the customer to interface his terminal to the BPSS access line through a "channel service unit" (CSU), which must be obtained from AT&T.

The phone company, in its latest pronouncement on BPSS, said the CSU complaint has been addressed previously in other proceedings and is unrelated to this one.

The gist of the comments that are said to address the issue is that the CSU enables AT&T to test the user's channel and perform other chores essential to providing network-based services; because these services are essential, independently made CSUs cannot be allowed.

The Independent Data Communications Manufacturers Association, a trade group representing many of the nation's major modem manufacturers, is leading the attack on the CSU.

AT&T's insistence on being the exclusive supplier "denies users an opportunity to select the equipment that best suits their needs and denies independent manufacturers an opportunity to market their products," the association told the commission recently.

Last Summer's Decision

At the moment, it appears the FCC agrees with AT&T that BPSS is a basic service.

Last summer, the commission rejected the initial filing on procedural grounds, but in the process said that "there is no question that Computer II permits AT&T to offer a packet switching service such as BPSS in the network as a basic service."

Subsequently, the phone company removed the commission's procedural objections by filing a Section 214 application, requesting authorization of the service, before submitting a tariff. The comments submitted recently by AT&T, GTE Telenet and other competitors are aimed at influencing the FCC's decision to accept, modify or deny this application.

The commission is also considering separately whether AT&T should be the sole provider of "network channel terminating equipment"; the CSU is one such piece of equipment.

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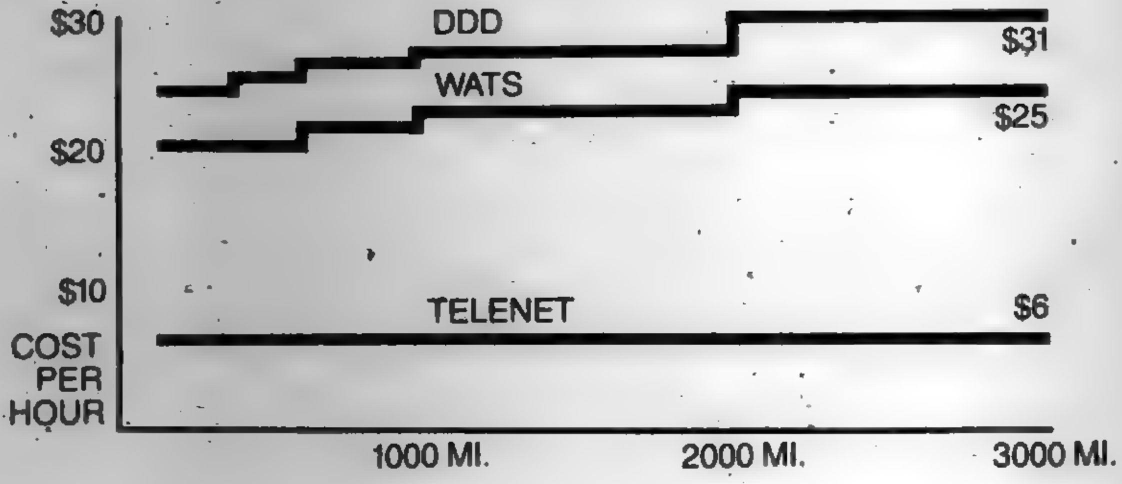

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Automation Seen Reducing Workers' Control

By Marguerite Zientara
CW Staff

CAMBRIDGE, Mass. — Computer systems in the work place tend to force managers' productivity criteria on employees, reinforcing biases against employees and making those biases more unchallengeable than ever, a Harvard Business School professor maintains.

In addition, according to Shoshana Zuboff, assistant professor of organizational behavior and human resource management, as paper documents and other tangibles are replaced by CRT images, work becomes more abstract and some workers find it more difficult to make decisions (see story below).

On the other hand, Zuboff contended, "For some jobs the word 'decision' no longer implies an act of human judgment, but an information processing activity that occurs according to rules embedded in a computer program."

Zuboff's conclusions were drawn from interviews with about 200 employees, supervisors, professionals and managers from organizations in three countries "to discover how people at distinct organizational levels respond to their work when it has been fundamentally reorganized by information technology." In the September-October 1982 issue of the *Harvard Business Review*, Zuboff wrote: "Partly by limiting a collector's discretion regarding how or in what order he or she should work on an account, an automated collection system makes it possible to increase production goals and reduce the time spent on each account" — a perfect example of management bias.

"Thus, for that activity the key to revenue generation becomes volume instead of collection skills," she wrote, adding that collection managers she interviewed "believe that the [automated] system enables them to recoup more funds while reducing their dependence on skilled collectors."

Zuboff described one company's automation of its collection function. When management wanted to design its automated collection system, it sought the ideas of "Bill Smith," who had managed collection activities for 30 years. The designers spent many hours picking Smith's brain and he helped them make many key design decisions. As one member of senior management put it, "We tried to build Bill Smith's brain into the computer. If we did not build it into the system, we might lose to the competition."

Smith's comments made clear some of the reasons the system eliminated most discretion from the job: "I like to see people work. I'm a good worker. I don't like to see people take time off. I don't do it."

But Smith's attitudes turned out to be costly. "A year after the system was in place, turnover had reached almost 100%, and the corporate personnel and employee counseling offices were swamped with complaints from replacements," Zuboff wrote.

"In the process of automating these jobs," Zuboff explained in a recent telephone interview, "[Smith] designed them with a model in mind that meant that the best design demanded the least skill on the part of the collector, where the most skill could be built into the processing of the machine.

"Smith took a job that was rich in skills, in opportunities for judgment, in opportunities for entrepreneurialism and created a set of jobs that were low in those same attributes. Meanwhile, these people had been collectors for years and had excelled in collecting precisely because they had these characteristics of skill, judgment and entrepreneurialism."

The skilled workers "found the jobs abominable once they were automated," Zuboff said. "They felt that the competence that they had developed over a number of years — what made them good collectors — was no longer relevant to the job."

While management could get away with less skilled, less expensive workers in the automated system, Zuboff said, "In practice, that turned out to be a pretty costly strategy, because [they] got people in there working these jobs who didn't care about them very much, who were not well-educated, who created all sorts of discipline problems and who didn't have much of a commitment to the job."

Blame It on Automation

CAMBRIDGE, Mass. — Feelings of frustration, loss of control and difficulty in making decisions can result from job automation when manual work suddenly becomes abstract.

In contrast with a potter's tactile sensations or a clerical worker's paper and pencil that put him "in touch" with his tasks, "with computer-mediated work, employees get feedback about the task object only as symbols through the medium of the information system," according to Harvard Business School Prof. Shoshana Zuboff.

"Very often, from the point of view of the worker," Zuboff wrote in the September-October 1982 issue of the *Harvard Business Review*, "the object of the task seems to have disappeared 'behind the screen' and into the information system."

In interviews with 200 employees in three countries, Zuboff said, "many employees I spoke to reported feeling frustrated because in losing a direct experience of their task it becomes more difficult to exercise judgment over it. In routine jobs, judgment often becomes lodged in the system itself.

"As one bill collector said: 'In our old system, come the end of the month, you knew what you were faced with. With the automated system, you don't know how to get in there to get certain accounts out. You have to work the way the system wants you to.' "

In complex jobs, too, people can lose direct experience of their tasks, she said. The comptroller of a bank that was automating commented, "People become more technical and sophisticated, but they have an inferior understanding of the banking business. New people become like systems people and can program instructions that don't necessarily reflect the spirit of the operation."

Feelings of frustration and loss of control were found to have been remedied somewhat in one instance at a bank branch by the maintenance of a manual card file system, which was supposed to have been replaced by the computer. When senior management questioned the need for such a manual system, the bank branch manager and his staff insisted

(Continued on Page 18)

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Robotics Center Established

BETHLEHEM, Pa. — The Institute for Robotics has recently been established here at Lehigh University under the direction of Dr. Roger Nagel.

The interdisciplinary center will reportedly provide universitywide access to robotics engineering and technology. It will also cultivate and coordinate the development of new and existing graduate and undergraduate programs as well as research activity focused on robotics.

Prior to joining the institute, Nagel worked as computer-aided design and manufacturing integration group leader at the National Bureau of Standards, and most recently as corporate manager of automation technology at International Harvester, Inc.

The institute is located at Lehigh University, 436 Brodhead Ave., Bethlehem, Pa. 18015.

MIT to Offer Course on OA

CAMBRIDGE, Mass. — MIT's Laboratory of Computer Science has announced a short course on "Integrated Office Systems: Software Architecture for Friendly Interfaces." The course is scheduled to run from June 27 to July 1 at the school's main campus.

Taught by Dr. Irene Greif and Dr. Marvin Sirbu, the course will present an approach to the design of user-friendly office systems. A variety of office system modules will be described as part of the course.

Attendance at the course costs $1,000. More information is available from the Director of the Summer Session, E19-356, MIT, Cambridge, Mass. 02139.

Automation Seen as Culprit

(Continued from Page 17)

they needed backup.

"The real reason came out," Zuboff reported, "when the branch manager made the following comment: 'You need something you can put your hands on. How else can we be sure of what we are doing?' "

How can management address these problems? It should "think through what kind of employment relationship it wants, what its ideas about human motivation are, what the expectations of the employees are and what sorts of visions of management, supervision and discipline management is implicitly or explicitly harboring," Zuboff suggested in a recent interview.

"The demands for a thoughtful and energetic management response go deeper than the need for a 'friendly interface' or 'user involvement,' " she pointed out in her article. "The underlying nature of this technology requires understanding; the habitual assumptions used in its design must surface.

"Managers' ability to meet these demands will be an important determinant of the quality of work in future organizations."

Color Graphics Conference Slated For March 10 in Tallahassee

TALLAHASSEE, Fla. — The 1983 International Computer Color Graphics Conference will be held here March 10-12. Over 2,000 attendees are expected to attend sessions at the Florida State Conference Center and Tallahassee/Leon County Civic Center.

The conference will explore four major application areas: arts and humanities, communications, facilities and resource management and medical sciences. Current applications and new findings in computer color graphics will be examined.

Speakers will include Dr. Robert Aangeenbrug, president of the National Computer Graphics Association and professor of geography, University of Kansas; and Dr. Thomas DeFanti, chairman of the Association for Computing Machinery's Special Interest Group on Computer Graphics.

Among others, the conference is cosponsored by Florida State University, Florida A&M University and the International Institute for Creative Communication at Florida International University.

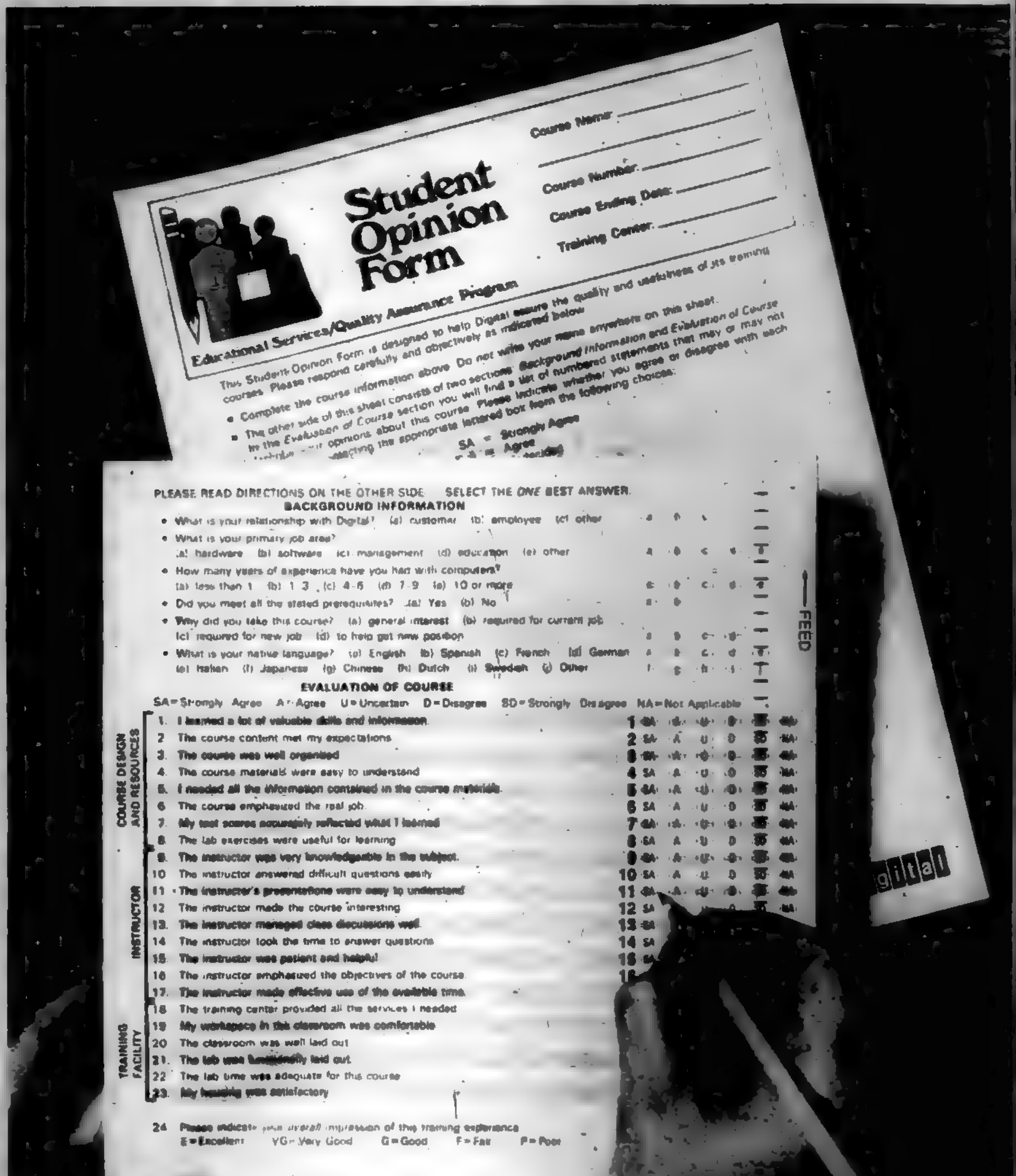
The conference fee costs $250. One-day fees are $80; the half-day fee is $40. Student admission is $25. More information is available from the Center for Professional Development and Public Service, Florida State University, Tallahassee, Fla. 32306.

Edition Offered On CAD/CAM

DALLAS — The third edition of "A Survey of Computer-Aided Design/Computer-Aided Manufacturing" (CAD/CAM) has been released by Leading Edge Publishing, Inc.

This text was compiled to help professionals purchase CAD/CAM systems. It features a tabular comparison of turnkey vendors as well as vendors of separate hardware and software products. It also reportedly contains strategies for cost/benefit trade-offs, a check list of management considerations and guides for development customized systems.

The reference tool costs $96 from the publisher at 317 Forest Central Two, 11551 Forest Central Drive, Dallas, Texas 75243.



Student Opinion Form

Course Name: __________

Course Number: __________

Course Ending Date: __________

Training Center: __________

Educational Services/Quality Assurance Program

This Student Opinion Form is designed to help Digital assure the quality and usefulness of its training courses. Please respond carefully and objectively as indicated below.

- Complete the course information above. Do not write your name anywhere on this sheet.
- The other side of this sheet consists of two sections: Background Information and Evaluation of Course. In the Evaluation of Course section you will find a list of numbered statements that may or may not [illegible] your opinions about this course. Please indicate whether you agree or disagree with each [illegible] selecting the appropriate lettered box from the following choices:

SA = Strongly Agree

A = Agree

PLEASE READ DIRECTIONS ON THE OTHER SIDE. SELECT THE *ONE* BEST ANSWER.

BACKGROUND INFORMATION

- What is your relationship with Digital? (a) customer (b) employee (c) other
- What is your primary job area? (a) hardware (b) software (c) management (d) education (e) other
- How many years of experience have you had with computers? (a) less than 1 (b) 1-3 (c) 4-6 (d) 7-9 (e) 10 or more
- Did you meet all the stated prerequisites? (a) Yes (b) No
- Why did you take this course? (a) general interest (b) required for current job (c) required for new job (d) to help get new position
- What is your native language? (a) English (b) Spanish (c) French (d) German (e) Italian (f) Japanese (g) Chinese (h) Dutch (i) Swedish (j) Other

EVALUATION OF COURSE

SA = Strongly Agree A = Agree U = Uncertain D = Disagree SD = Strongly Disagree NA = Not Applicable

COURSE DESIGN AND RESOURCES

1. I learned a lot of valuable skills and information.
2. The course content met my expectations.
3. The course was well organized.
4. The course materials were easy to understand.
5. I needed all the information contained in the course materials.
6. The course emphasized the real job.
7. My test scores accurately reflected what I learned.
8. The lab exercises were useful for learning.

INSTRUCTOR

9. The instructor was very knowledgeable in the subject.
10. The instructor answered difficult questions easily.
11. The instructor's presentations were easy to understand.
12. The instructor made the course interesting.
13. The instructor managed class discussions well.
14. The instructor took the time to answer questions.
15. The instructor was patient and helpful.
16. The instructor emphasized the objectives of the course.
17. The instructor made effective use of the available time.

TRAINING FACILITY

18. The training center provided all the services I needed.
19. My workspace in the classroom was comfortable.
20. The classroom was well laid out.
21. The lab was functionally laid out.
22. The lab time was adequate for this course.
23. My housing was satisfactory.

24. Please indicate your overall impression of the training experience.

E = Excellent VG = Very Good G = Good F = Fair P = Poor

Concentrate on Preventing Contract Litigation: Lawyers

By Paul Gillin
CW Staff

WALTHAM, Mass. — Buyers of computer equipment and software expend too many resources fighting breach of contract and fraud suits and too few resources defining contract language and remedies that could prevent litigation, according to two attorneys who specialize in computer contract law.

Because so many areas of computer contract law are ill-defined, buyers should try to negotiate a contract that defines the responsibilities of each party and spells out what happens if the relationship founders, agreed John M. Conley and James J. Marcellino, attorneys at the Boston-based law firm of Gaston Snow & Ely Bartlett. The two lawyers spoke at a recent meeting of the New England Computer Law Forum here.

"Generally, a computer contract states that the equipment will be free from defects in workmanship and materials for one year and that the release will meet the specifications of the product," Marcellino said.

He added, "I'm also not quite sure what 'free from defects' means when applied to software."

Under the standard contract limitations, the vendor is required only to repair or replace a product under warranty, Marcellino said, even though the remedy might be wholly inadequate for the user. "What makes anyone think the vendor can provide a cure when they couldn't even do it right the first time?"

John Conley

CW Photos by P. Gillin

James Marcellino

Marcellino outlined five practical points for a buyer to follow to avoid contractual calamity:

- Understand the contract language and be sure it specifies the maintenance responsibilities of the parties and remedies. The language should be written in terms that can be understood by a jury and the buyer should be relatively certain the pact can stand up in court.

"It is my view that you can set out in the contract the period of time you have to test the system" and reject it without risk, he said.

- Understand computer sophistication vs. bargaining power. A jury is more likely to let a small business get away with pleading ignorance than a big company, Marcellino said. "Even if you're a big company without much computer sophistication, don't expect ignorance to get you out," Conley added. "A jury will believe you have the money to hire experts."

- Decide how to effect cover. If you are looking to switch software packages, Marcellino said, "should you tell your current vendor you're going to check out other vendors and risk losing his maintenance and support or do you just go looking without telling him at all? In litigation, the vendor will argue you're using trivial problems [as an excuse] to switch packages. My recommendation is to tell your current vendor about your problems and at the same time look elsewhere."

Anything written on paper is subject to discovery (compulsory disclosure) in court, he said. If you are going to go looking for a new product and not tell your vendor, do not write that fact down.

- Use a fact-based record-keeping system. If a technician fails to fix a problem, record the fact that the system still does not work and not your opinion that the technician tried hard to fix it. "Record facts, not opinions," Marcellino said. "Facts win cases. It simplifies the task [of arguing the case] and I believe it will generally help you avoid litigation."

- Understand the attorney-client privilege. It provides protection for what is said between an attorney and a client. If something goes wrong, consult an attorney first, Marcellino said. Conversations with anyone else may be discoverable in court.

Current users can also take steps to insure themselves, he added. "We recommend you should have a [technical] expert in on the deal before the contract is signed," he said. "If not, get the expert in as soon as possible."

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Bibliography of Computer Books Released

By J. Daniel Couger
Special to CW‡

The Thoth System is an example of a high-quality book included in the 16th edition of the *Annual Bibliography of Computer-Oriented Books*, released this month by the University of Colorado. Thoth is a technique for multiprocess structuring and portability developed by the University of Waterloo.

Only 20% of the 276 new books included in the bibliography can be classified as of high quality; nevertheless, at least one good book was published in over half of the bibliography's 61 categories. The most significant improvement occurred in the categories of advanced programming and microcomputing.

On the other hand, several dozen inadequate books were published in the micro area, and those books are excluded from the bibliography. Among those retained are *IBM's Personal Computer* by DeVonney and Summe and *Structure and Programming of Microcomputers* by Jermann.

Of the 12 new books on management of DP, five are quite good, including Singer's *DP Manager's Survival Manual* and Nolan's *Managing the Data Resource Function*.

All introductory-type books published prior to 1980 were deleted from the bibliography. Despite the deletions, the bibliography still contains more than 1,000 books from 170 publishers. The bibliography separates the books into 61 categories and catalogs them according to type (reference, textbook, handbook) and style of presentation (programmed instruction, case study or narrative).

Maintenance Programming

With over 50% of the typical DP labor budget spent on maintenance, it is surprising that so few books have been written on the subject. A new section on maintenance in the latest edition of the bibliography contains seven books, compared with more than 10 books on programming new applications.

The oldest maintenance book has been out for only two years, Parikh's *Techniques of Program and System Maintenance*. The second edition of that book was released this year and was considerably strengthened.

An important new entry on this topic is *Maintenance of Computer Programming* by Martin and McClure.

Advanced Programming

The section on advanced programming now contains 115 entries. Among the better books are *Formal Methods of Program Verification* by Berg and three coauthors and Gerald Weinberg's *Walkthroughs, Inspections and Technical Reviews*. *Portable Programming* (Wallis) is another solid addition to that section.

Pascal finally supplanted Basic for the honor of the largest number of new books on a specific language. Sixteen new Pascal books were published, compared with 15 on Basic.

Despite the number of Fortran programs still in existence, new books on the language are scarce. Only five new Fortran books were published.

In contrast, four new Ada books were published. The section on the new language, Forth, now has four entries. Surprisingly, three new books were published on the ancient RPG language. A combined total of 10 new books were published on Cobol and PL/I.

The section on special languages was expanded to 24 books. *A User Guide to the UNIX System* by Thomas and Yates is a valuable addition.

Microcomputer books dominate the additions to the section on books related to specific machines. Examples are *Apple Pascal* (Tucker) and *Fast Basic Beyond TRS-80 Basic* (Gratzer and Gratzer).

System Analysis and Design

Distributed systems took over first place in quantity of new books published on the subject of system analysis and design. Thirteen new books were added to the distributed systems section. Bray's *Distributed Database Management Systems* is one of the better newcomers.

Ten books were published last year on the subject of data base, increasing that section to 47 entries. *Logical Data Base Design* (Jones, Curtice) and *Strategic Data Planning Meth-*

(Continued on Page 22)

1983 NATIONAL DATA BASE MANAGEMENT SYMPOSIUM

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Bibliography Covers DP Books

(Continued from Page 20)

odologies (Martin) are high-quality additions to that section.

Sprague and Carlson's *Building Effective Decision Support Systems* strengthened the decision support system/management information system category. Schneider's *Automated Tools for Information System Design* is an important addition to that category.

The communications section, containing a total of 27 books, was enhanced by Ahuja's *Design and Analysis of Computer Communications.*

Application Books

Because of space limitations, the only application books included in the bibliography concern business uses of the computer. Of the 31 new books in that category, the Visicalc books were predominant. A representative one is Anbarlian's *Introduction to Visicalc Matrixing for Apple and IBM.*

Examples of improvements in accounting are Cushing's *Accounting Information Systems* and *Auditing Computer Applications* by Davis and Perry. *Directions in Human Computer Interaction* (Badre, Shneiderman) improves the behavioral application section. Grawoig and Hubbard's *Strategic Financial Planning With Simulation* is an important new application book, as is *Professional Forecaster* by Cleary and Levenbach.

The best of the new production application books is *Principles of Inventory and Materials Management* by Tersine.

The fastest growing application area, for the second consecutive year, is office automation. That section now contains 27 books.

Artificial Intelligence

The section on cybernetics and artificial intelligence now contains 26 books. The 978-page, two-volume publication by Winston and Brown, *Artificial Intelligence,* is impressive not only in size but in content. At the other end of the size continuum, but also valuable, is Klopf's *The Hedonistic Neuron.*

In addition to the previously mentioned books on management of DP, Weil's *Information Systems in the 80's* should be in the library of every person involved in DP planning. *Guidelines for Evaluation and Selection of Software Packages* (Brownstein and Lerner) is another valuable reference for managers.

Unfilled Needs

The lack of new books in several important areas may be indicative of the lack of progress of computing in those areas. The section on computers and society had no 1982 additions. Nor did the sections on marketing and government applications. One hopes that some creative work is nearing completion in those areas.

The 16th edition of the *Annual Bibliography of Computer-Oriented Books* is available for $4 from Computer Newsletter, Box 7345, Colorado Springs, Colo. 80933. The cost is $6 if an invoice is required.

Couger is a professor of computer and management science at the University of Colorado.

Free Brochures

- "CICS Security Package Evaluation Checklist" was designed to aid software users in the task of evaluating and selecting appropriate software to fill their security needs. The brochure includes detailed questions to help readers critique any CICS security system. It can be obtained from Bernie Burke at On-Line Software International, Fort Lee Executive Park, 2 Executive Drive, Fort Lee, N.J. 07024.
- "Small Computers — A Maintenance Challenge and Opportunity for the Eighties" is a four-page booklet that outlines the maintenance challenge confronting computer companies and presents new self-maintenance concepts for computer manufacturers and users alike. It is available from Innovative Computer Products, 18360 Oxnard St., Tarzana, Calif. 91356.
- Monolithic Memories is offering five new application notes and design instructions. These include "Proms, Pals, Fifo and Multipliers Team Up to Implement Single-Board High-Performance Audio Spectrum Analyzer"; "A Dedicated Multiplier/Divider Speeds Up Multiplication and Division for 8-Bit Microprocessors"; "Fifo: Rubber Band Memories to Hold Your System Together"; "Big, Fast and Simple — Algorithms, Architecture and Components for High-End Superminis"; and "Using ADPCCM for Image Compression." The frim is at 1165 E. Arques Ave., Sunnyvale, Calif. 94086.

IEEE Offers Scholarships

SILVER SPRING, Md. — Four newly established $3000 scholarships are available for the 1983-1984 academic year from the Computer Society of the Institute of Electrical and Electronics Engineers (IEEE).

The Richard E. Merwin Scholarships, named after the late IEEE Computer Society president, are available to Computer Society student members who are active in the student branches of this society. Students must have maintained a grade point average of at least 2.5 and be full-time students in a computer-related discipline.

For more information contact IEEE at P.O. Box 639, Silver Spring, Md. 20901.

Introducing the portable computer for professionals on the move. Hewlett-Packard's new HP-75.

A decade ago, we introduced the world's first scientific pocket calculator and rendered the time-honored slide rule obsolete.

Now we're introducing the HP-75 portable computer. And if press reaction is any indication, history is about to repeat itself.

As small as a book. As powerful as a personal.

Desktop-computer power in a handsome 26-ounce package. That's the HP-75. It's just 10 inches by 5 inches by 1¼ inches.

But don't let the compactness fool you. Inside its rugged case lies a 48K-byte, ROM-based operating system. With a comprehensive, 147-command instruction set that helps you write hard-working, memory-efficient BASIC programs.

Plug-in ROM ports let you add up to three 32K-byte software modules—modules that solve tough problems *without* sacrificing user memory.

And that user memory gives you up to 24K bytes of program and data storage.

It all adds up. A fully loaded HP-75 is a 168K-byte computing powerhouse in calculator clothing.

Want more? A built-in magnetic card reader provides a convenient, inexpensive way to store and retrieve programs or data.

The HP-75's typewriter-like keyboard means rapid, accurate entry of text or data. And when we say you can touch type on it, we *mean* you can touch type on it.

Those keys, by the way, can be redefined with your favorite commands or programs. Up to 196 unique key combinations in all.

Immediate, convenient access to your most frequently used programs.

Thanks to the HP-75's multiple-file structure, programs, data and text can be named, simultaneously stored in memory, and programmed to interact with each other.

Add continuous memory, and you've got a computer that's designed to solve problems on the go. Simply load your favorite files and enjoy immediate access to any or all of them. The files are retained in memory until you decide to delete them —even when the machine is turned off.

Time and appointments to keep you on schedule.

The TIME key brings to display the day of the week, date and time to the nearest second.

The APPOINTMENT feature reminds you — an hour from now or a year from now — of things you have to do. You can have a silent message on the display, any one of six alarms, or a combination of both.

Even if the machine is turned off, it will "wake up" and alert you of an appointment. Or it will execute programs or control peripherals according to predetermined schedules.

In an environmental test, for instance, where readings are taken every half hour, the HP-75 can make sure its owner gets the weekend off.

Software tailored to solve your specific problems.

HP-75 software is now available in areas such as math, engineering, finance, and statistics. With spreadsheet analysis* on the way.

Our plug-in math module,* for instance, solves polynomial roots, evaluates integrals, and performs finite Fourier transforms.

With our text-formatter module,** you'll compose memos, letters, and short documents virtually anywhere; then print them out when you return to your home or office.

In addition, our third-party software program assures you of ever-expanding software variety.

If you're a volume purchaser or OEM, give us a call. We can help you create custom HP-75 systems with special plug-in modules, magnetic cards, digital cassettes, and keyboard overlays.

Peripherals for a total computing package.

The HP-75 is equipped with the Hewlett-Packard Interface Loop, giving you a choice of 15 peripherals. (And that choice is expanding. The HP-75 *can* work simultaneously with up to 30.)

In a battery-powered briefcase system weighing about seven pounds, you might have the 24-character printer, digital cassette drive and acoustic modem.***

A desktop system might include the 80-column impact printer, full-color graphics plotter, and 12-inch video monitor.

And the HP-75 can "talk to" other computers, peripherals, and instruments with our HP-IB (IEEE-488),** RS-232,* and GPIO interfaces.

In summary, the HP-75 is the heart of an extremely versatile system, in addition to its stand-alone capabilities.

Manuals to make sure you get the most from your machine.

Chock-full of examples and helpful hints, our owner's manual will get you up and running in short order. And it's organized to help you access the information you need to get on with the job at hand.

A supplementary reference guide provides a concise summary of the computer's operating protocol and instruction set.

The value you're looking for.

What is the price of all this power in this compact package? $995.**** A lot less than you might pay for a personal computer you can't take with you.

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*Available May 1, 1983.
**Available March 1, 1983.
***Call our toll-free number for availability.
****Suggested retail price. May vary outside U.S. Peripherals and software not included.

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Should Managers Hire Trainees?

Turnaround Time
By Larry E. Long

Q **Your comments about entry-level programmers have been interesting to me for two reasons: I am the director of a data processing department and am responsible for proper staffing, and my son will attempt to find an entry-level position next year.**

Your advice may not be representative of the "real" world. I'll admit that I am guilty of looking at staffing from a very narrow viewpoint, but my thinking is probably representative of that of other managers. The following represents some fragmented business reasons for not hiring trainees:

- **Entry-level people are not trained properly. The schools teach what it is convenient to teach and ignore the real requirements of industry.**
- **The cost to train an entry-level person is about $10,000, most of which is in the first year. If this $10,000 is added to the salary, it is easy to see that one can afford an experienced person.**
- **The typical entry-level person is a recent graduate who has been influenced by a teacher/instructor with little or no business background. He is taught to do something because "it is the correct" or "the only way to do it." However, in the business world it is necessary to take shortcuts.**
- **A patient senior person is required to guide an entry-level person. Without this resource commitment, an entry-level hiring program is destined for failure.**

When my son graduates, I will offer him the same advice I have given others. He should work for a company for six months at no pay and ask only for a letter of recommendation in return.

A Over the long term, your hiring philosophy may be deleterious to both your department and the corporation. When you hire people to fill project manpower requirements (for example, "bodies"), you hire someone for immediate, not long-term, purposes.

Since high-potential "experienced" people are rare and expensive, the choice is often between hiring someone with low potential and experience or a recent graduate with high potential. If you consistently choose the former, where will you be in five years with respect to productivity, systems quality and management potential?

You are correct in saying that entry-level people are not "trained" properly. Most academic institutions aspire to *educate* people by arming them with the ability to synthesize and learn. True, some institutions achieve this objective better than others, but some of them have more with which to work.

If it were the academic world's responsibility to teach job control language, then which vendor's language should be taught? *Training* is industry's responsibility.

You talk about the $10,000 cost of entry-level training and how that could be better applied to the salary of an experienced person. Don't forget that $10,000 increment must be applied annually.

I'm not recommending that all new employees come in at the entry level, but that the long-term potential and cost-effectiveness of entry-level hiring should not be overlooked.

I suppose this entire discussion is moot since there aren't enough experienced people to go around. To make matters worse, the business community is not making much of an effort to replenish this pool.

Q **How can I get started in DP consulting? I have two years' programming experience, enjoy working with people and am eager to bring more interesting challenges into my life.**

A A company engages a consultant because his unique experiences and expertise are needed to realize organizational objectives. Since people with your qualifications can be found in just about every shop in the country, there will not be much demand for your services.

One enters the DP consulting field after gaining experience and developing a marketable expertise. Also, advanced degrees have just about become a prerequisite for the successful information services consultant.

You may have said "consulting" and meant contract programming. If so, be advised that contract programming is not consulting — it is work force augmentation. These are often confused in print.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*

HP-75 SPECIFICATIONS
Size and weight: 10" X 5" X 1¼" 26 oz.
48K-byte, ROM-based operating system:
• 8-bit CMOS CPU • Multiple file structure in continuous memory • Instruction set: 52 system commands, 43 BASIC commands, 41 numeric functions, 7 string functions, 6 time-mode commands, 16 arithmetic/logical/relational operators
Numeric precision:
• Real – 12 digits (± 9.99999999999 x $10^{\pm 499}$)
• Short – 5 digits (± 9.9999 x $10^{\pm 99}$)
• Integer – 5 digits (± 99999)
Time/appointments:
• Perpetual clock/calendar • 12- or 24-hour format • Appointment control of command/program execution
Memory:
• User (RAM) – 16K bytes, expandable to 24K bytes • Operating system (ROM) – 48K bytes
• Plug-in software (ROM) – up to 96K bytes (3 32K-byte modules)
Typewriter-like QWERTY keyboard:
• 65 keys • 194 redefinable key combinations
• "Hidden" numeric keypad
Integral mass storage: hand-pulled card reader (1 3K bytes per card)
Built-in interface: HP-IL; choice of 15 peripherals
Power supply: 3 AA NiCad batteries (AC adapter/charger included)
Liquid-crystal display: 32-character window on 96-character line
PG02304 282 C

Confection Firm Finds Sweet Deal in Simulator

CAMBRIDGE, Mass. — Installing a program simulator turned out to be a sweet deal for the data processing department at Nabisco Confections, a subsidiary of Nabisco Brands, Inc.

Nabisco Confections, which makes a variety of popular candies including Junior Mints, Sugar Daddies, Sugar Mommas, Sugar Babies and Pom-Poms, had first computerized in 1969. The DP department has since grown to include 22 terminals connected to an IBM 4331 running DOS/VSE. However, the department had never found time to document the programs developed over the years. As a consequence, a backlog of more than 400 undocumented applications had developed.

"When you've got a small staff you develop a program and then management comes along and gives you another project," said Don Dunn, director of data processing at Nabisco Confections. "You simply don't have time to keep your documentation up to date."

Dunn found the problem became more pronounced as the DP department at Nabisco Confections grew in size and responsibility. The company was running major programs like payroll, accounts payable, sales and marketing analysis, order entry, inventory and more, all developed in house and none fully documented.

"My two application programmers are crackerjack systems people," he said. "But given our mass of existing programs how do you motivate people to perform maintenance on undocumented programs?"

Dunn took advantage of a windfall he found at the end of last year. "Near the end of last year I found I had a few extra bucks in my budget," Dunn said. While reading a trade magazine he came across an article about Structured Code Analysis (Scan)/370 from Group Operations, Inc. "With a huge inventory of undocumented production programs undergoing constant maintenance, two application programmers new to the organization and constant demand for new application development, I responded to Scan/370," Dunn said.

After checking with some user installations, Dunn contracted with Group Operations to become the first DOS installation for Scan/370. "We had a few glitches at first, but the vendor's support staff nailed those down over the phone," Dunn said.

Documenting Time Reduced

Having originally budgeted six to eight months to document Nabisco Confections' backlog of programs, the programming staff was pleased to find the project completed in three months.

"If I had to go back and document every program, including some that were four to five years old, it would have taken a helluva long time," Dunn said. "Scan/370 has saved us six man-months."

Scan provides the user with a list detailing exits and subroutine jumps. Dunn said the product works especially well with the nonstructured "spaghetti code" Nabisco Confections has always used for program development.

Particularly useful to Dunn's staff is a "before and after" snapshot feature that allows the programmers to see exactly where changes were made. "Any time we change a program we recompile and then run through Scan," Dunn said. "That feature is especially good for auditing."

Dunn admits that Scan/370 is still "half a loaf," because it offers only program documentation. "It doesn't give system flowcharts, runbooks for operations or narratives," he said. "It couldn't document systems work."

But he said the package was well worth the $15,000 price tag. "For a small installation such as ours money is obviously a factor, but more important was the need to accomplish many things without installing three or four packages to do what Scan/370 alone can do," he said.

NBS Offers Publications

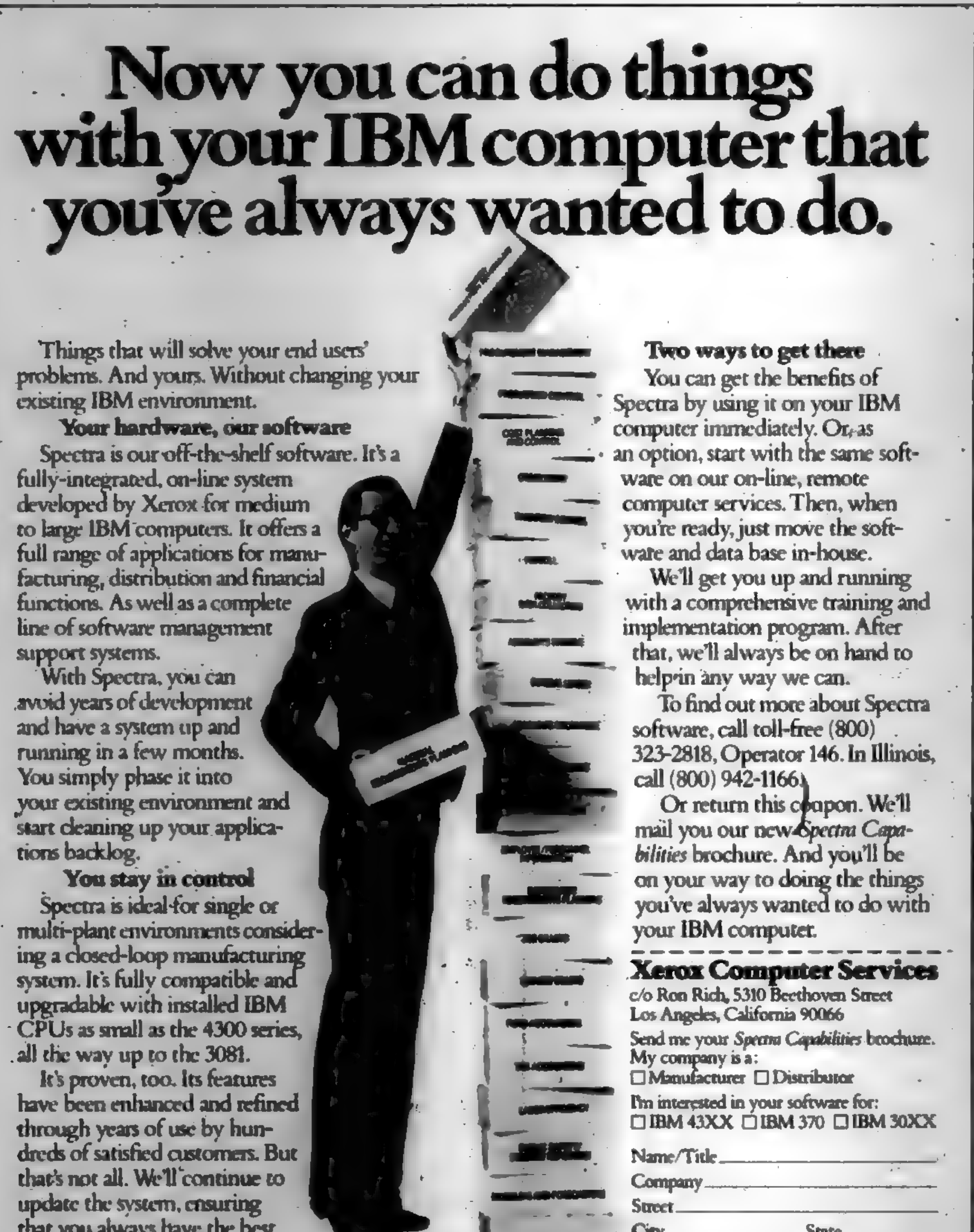
WASHINGTON, D.C. — The National Bureau of Standards has announced the availability of three data-processing-related publications.

"The Selection of Local Area Computer Networks" (SP 500-96) gives advice on features of different networks, how to identify the needs of an installation and how to determine which network will support those needs. It costs $6.

"Planning for Software Validation, Verification and Testing" (SP 500-98) is aimed at helping programmers and managers select and use validation, verification and testing tools. Priced at $5.50, it describes a phased approach to software development and describes the fundamental concepts of verfication, validation and testing.

A companion to that report is "Software Validation, Verification and Testing Technique and Tool Reference Guide," which describes 30 techniques and tools for verification, validation and testing. This publication is priced at $6.

The publications can be ordered from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20234.



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Firm Meets 'Focus' Needs With Minicomputer

NEW YORK — Time-sharing just was not enough for a software vendor here when it came to handling customer training and program development.

Information Builders, Inc. had been tied into a time-sharing network, but found it was not adequate to demonstrate all the features of its Focus information control system product. In particular, high-speed terminal support, which was essential for using the full-screen formatting and graphics capabilities, was not available.

According to company President Gerald Cohen, Information Builders considered several systems in its search for a suitable computer, including IBM's 4331 Group 1, but found its memory capacity of 1M byte unable to support Focus effectively. Magnuson Computer Systems, Inc.'s M32 was also considered, but its processing power and price tag were both more than Information Builders required.

The company then learned of Formation, Inc.'s 32-bit minicomputer, the F/4000. This product was found to be compatible with the IBM 370 system and could support all of the IBM operating systems and any application software designed for the IBM environment. But unlike the 370, the F/4000's 8M-byte memory capacity could easily accommodate the core requirement of the Focus package under VM/CMS, according to Cohen.

In April 1981, representatives from Information Builders visited Formation headquarters with a tape containing Focus code.

"In a matter of minutes, Focus was up and running on the F/4000 under VM/CMS," Cohen said. As a result, the F/4000 was selected.

Alan Gerber, computer facilities manager at Information Builders, said that since its implementation in July 1981, the F/4000 has satisfied everyone's expectations.

In addition to using the system for all customer training and marketing demonstrations, other applications, including administrative functions and program development, have been added.

Having an in-house machine has afforded much more control and accessibility in the company's system development efforts, according to Cohen.

He said that good throughput is the most important consideration with a system like Focus and noted that the F/4000 offers "a very cost-effective way of providing services."

Information Builders reportedly is running the latest release of IBM's VM/SP on their new system. Also, IBM's Remote Spooling Communications Subsystem and IBM's VM Pass-Thru are used to make IBM's TSO available from the service bureau via an F/4000 terminal.

The system is now utilizing 3M bytes of memory, eight Formation F4277 terminals and three IBM 3277 display stations on an IBM 3272 cluster.

Study Outlines Tax Recovery

PRAIRIE VILLAGE, Kan. — "Let The Government Pay for Your Computer" is the name of a recently published report from Research Press, Inc.

According to this report, there are a number of ways that buyers of desktop and personal computers can justify a substantial tax recovery for their purchases via depreciation and business expense tax write-offs.

The booklet is available for $6 from Research Press, Inc., Box 8137-P, Prairie Village, Kan. 66208.

DPMA Group Elects President

PARK RIDGE, Ill. — The Data Processing Management Association (DPMA) Education Foundation has elected Terrence J. Boyer as its president for 1983. Elected a foundation regent in early 1981, Boyer is vice-president and manager of information planning and control for Mercantile Trust Co., N.A., St. Louis, Mo.

Boyer is currently coauthoring the first textbook in the DPMA's Model Curriculum series, titled *Computer Information Systems: An Introduction*, scheduled to be released soon.

Boyer is the former president of the St. Louis chapter of the DPMA and has achieved the DPMA Gold Award. For the past two years, he has been the coordinating regent responsible for the foundation's Model Curriculum for Undergraduate Computer Information Systems Education.

Boyer has over 20 years of experience in information processing, of which the past 12 years have been with Mercantile Trust. Previously, he was manager of applications systems at Mercantile. He holds a B.A. from Ohio State University and a master's degree from Southern Illinois University.

The DPMA's Education Foundation was established in 1975 to expand educational opportunities for information systems professionals and to conduct research and programs of benefit to the DP industry, educators, business, government and the public.

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Indiana Squeezes Manager Out of Entry/Edit System

INDIANAPOLIS — Indiana's Marion County Welfare Department has managed to squeeze application management functions out of a data entry/editing system designed for grass roots administrative tasks.

Marion County is using its Inforex, Inc. System 3200 data entry/editing system to streamline the distribution of food stamp coupons, provide closely controlled participant coordination with the state welfare agency and to monitor and control its own expenses and disbursements.

Administrative analyst Ben Tuttle, who has one course in Cobol programming under his belt but no programming experience, "began playing around with the system immediately when I started this position a year ago," he explained.

"The state's Food Stamp and Aid to Dependent Children Programs wanted to cut problems they were having with the Authorization to Participate [ATP] cards," he said, "but I didn't like a lot of their concepts because they would have been impossible to administrate in terms of our case load."

The ATP card is mailed out to food stamp recipients to be used like a check, Tuttle explained. The family then brings the card to a food stamp point of issuance to get the stamps.

In "playing around" with the Inforex system, Tuttle "began to realize its capabilities and developed the concepts I liked" in food stamp administration.

The result was more than a dozen programs written in Inforex's Ideal data entry programming language. "Over the course of about two months, I squeezed the programming in where I could," Tuttle said. "I utilized primarily the machine's capability to reformat files and used the efficiencies of data input."

Valuable Link

Twelve of Tuttle's programs help provide a valuable link with the state welfare department's computer in maintaining accurate records of food stamp program participants.

Marion County updates daily the computer tapes sent from the state agency, adding new families and deleting others that are no longer eligible — approximately 2,000 to 5,000 per day — and prepares updated rosters of eligible households for use at the food stamp point of issuance. One of the 12 programs used for this application is a three-page document providing a list of job statements to be entered by the input operator.

The work the Marion County Welfare Department does in the food stamp program has already produced savings in prevented duplicated payments. A plan is currently being developed to eliminate mailing food stamp eligibility notices to households and simply use the daily control rosters at the points of issuance.

"We've used listings in the past, but this plan would include daily updates of the rosters for a more workable listing size," Tuttle said. When fully implemented, the savings in postage could amount to $5,000 per month.

Other programs aid the accounting department in producing reports on collections and disbursements made by the county, including detailed analysis by account incorporating year-to-date totals and remaining account balances. Information provided by the accounting department is entered centrally, sorted and reformatted and printed by the System 3200.

Marion County first started using Inforex data entry systems in 1972 for basic accounting support applications. In 1981, the department upgraded that system to the System 3200 with four keystations, 10M bytes of disk storage and a tape drive.

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EDITORIAL

Don't Pack Your Bags Yet

The decision by the American Federation of Information Processing Societies, Inc. (Afips) to hold next year's National Computer Conference at some site other than Houston is basically a sound one. It will obviously benefit the vendors, and it will have an impact on the tens of thousands of users who travel from all over the world to attend the mammoth show each year. However, the decision does have its potential thorns.

Without a doubt, NCC and its crowds have outgrown nearly every convention center in the U.S. In New York, although the convention was based at the Coliseum, which is adjacent to the city's famed Central Park, the exhibits and lectures were split between surrounding hotels. Users attending a New York-based show not only had to cope with the flood of information and vendor pitches common to the NCC, but they had to be marathoners to sit in on presentations held in various parts of the city.

Anaheim, Calif., the site of this year's show, is little better. Although the city has a larger exhibit hall — the Anaheim Convention Center — the NCC exhibits usually overflow into the garages that hang like wings from the sprawling building. As veterans of the "Disneyland circuit" know, the metal and concrete structures become high-tech ovens when filled with the crowds and baked under the hot California sun. State-of-the-art machines, unlucky enough to be relegated to the garage, often succumb to the combination of heat and hordes.

And in both cities, if hotel reservations were not made at least a year in advance, show attendees had either to double up with willing friends or to stay at less-than-four-star hotels that might be up to a one-hour drive away.

Afips reported that the 1984 convention site will be either Las Vegas or Chicago, both of which reportedly have adequate display facilities and hotels to handle the more than 100,000 people who are expected to attend the show. But don't pack your bags yet.

Although the NCC Committee has ruled out Houston as a site, that city claims it planned to renovate its Astrodomain complex to the tune of $50 million and has an additional 4,000 hotel rooms since last summer. The loss of $47 million in business brought by the show and the impact of that loss on the city's Texas pride hint that Houston has not yet given up the fight for NCC.

In addition, Afips plans to hold the 1984 computer show in midsummer, probably early July, forcing executives, managers and users alike to cancel or rework vacation schedules and to juggle budgets and acquisitions that might be based on spring equipment and technology debuts.

Last year, vendors and users complained to Afips that details and schedules of the 1982 show were withheld until the last possible moment.

This year, Afips has revealed its plans for the 1984 event well in advance. Unfortunately, those plans have all of the elements of a fair, albeit lopsided, television soap opera: three possible locations, a disgruntled city and 100,000 people left waiting at the technology altar.

'I See You Next New Year's Eve, Drinking a Champagne Toast to Your 1983 Accomplishments — Or Is It Cyanide?'

LETTERS

The 'Real' Message

The final paragraph of the editorial, "Think Twice" [CW, Jan. 17], which is about the IBM vs. Bridge Technology, Inc. trade secrets case, is a non sequitur.

For *Computerworld* to say that "the real message . . . is that IBM is ready to make examples of those close to the company with higher ambitions" ignores the fact that IBM proprietary assets were misappropriated and misused.

The permanent injunction obtained by IBM has nothing to do with anyone's "higher ambitions." Rather, it is designed to prevent illegal acts.

The *real* message, to use your term, is that people should not act unethically or illegally.

Furthermore, to say that "companies will have to think twice before deciding to tackle a market in which IBM already has a presence" again ignores facts.

Many honorable and able competitors continue to offer products in areas where IBM has a presence, and they do so without misappropriating trade secrets.

Edward Nanas
Director of Information
IBM
Armonk, N.Y.

From the 'Outside In'

Edmond H. Weiss makes some valuable points in the In-Depth article "Usability: Toward a Science of User Documentation" [CW, Jan. 10], in particular, his suggestion that a detailed technical review take place early on in the documentation process.

He is incorrect, however, in his description of users as creatures that are as "passive and dependent as electronic circuitry." In addition to this, I do not agree that it is the purpose of documentation to "control" users.

The fundamental problem with Weiss' documentation process is that it works from the "inside out," that is to say, from the technical to the general.

In my experience, the best user documentation is written from the "outside in" — that is, by a writer with a limited technical knowledge of the system who can adopt the user's perspective and begin with the question, "How will the system help me to do my job?"

It should be the purpose of user documentation to aid the user in controlling the system.

Technology must serve people, not the other way around.

Naomi Leventhal
Performance Resources, Inc.
Falls Church, Va.

On Hiring a Lawyer

The article "Lawyers: Seek Legal Aid During Contract Talks" [CW, Jan. 10] quotes an attorney who recommends that lawyers be involved in purchases of software over $10,000 or purchases of hardware over $30,000.

The value of the transaction to the buyer's business and the potential damages he may suffer if something goes wrong should determine whether a lawyer is used.

At the dollar levels cited in the article, most of us would be forced to hire a lawyer every time we bought a new car.

Peter A. Marx
Vice-President and
General Counsel
Chase Econometrics
Interactive Data Corp.
Waltham, Mass.

SOFTLINE/Werner L. Frank‡

A Look at Computing in Southeast Asia

The fourth biannual Southeast Asia Regional Computer Conference (Searcc) met recently in Kuala Lumpur, Malaysia. In attendance were nearly 600 delegates, representing the data processing communities of seven member country associations, including the hosting Malaysian Computer Society and similar groups from Indonesia, Singapore, Hong Kong, the Philippines, Thailand and India. The language common to these representatives is English.

I was privileged to be an invited guest speaker, along with a number of others representing the U.S., Japan and the local areas. The visit provided an in-depth look at computer-related activities in this developing area of the world.

What a difference 13 years makes! I recall leading a U.S. Commerce Department trade mission for DP in 1970 to this very same area. At that time, data processing was the province of only the largest multinational companies, with small installations at the leading bank, universities and, perhaps, the central government. Now computers are distributed much more widely, and all sizes are utilized, from the smallest micro to sophisticated mainframes embedded in telecommunications networks.

A thriving and rapidly growing example of commitment to the promise of the computer is Malaysia itself. Founded in 1957 as an independent country, this nation is moving rapidly to achieve a modern and viable economy. Here both industry and government recognize the role that DP plays in providing productivity improvements in basic production, public administration and manpower performance.

Malaysia counts approximately 550 computers in the categories of minis and mainframes. This census includes large-scale computers from IBM, ICL, Inc. and Sperry Univac, with other vendors, especially the Japanese, actively marketing the area. Planning for the future is based on the widely accepted expectation that current installations will be upgraded to even larger systems.

The national government of Malaysia has shown aggressive leadership in recognizing the potential benefits of automation. Led by the Modernization and Manpower Planning Unit (Mampu) in the prime minister's office, the federal government provides leadership and guidance to all elements of administration. Encouragement and direct consulting aid assists other governmental units wishing to embrace DP. Policy and direction are also provided.

Two Significant Steps

Governmental awareness of the importance of the computer is evidenced by two significant steps that were taken during my one-week stay in Kuala Lumpur. First, the Ministry of Education announced plans to introduce the subject of computer science into the secondary schools. An official declared that "there is no way we can leave out computer science from our school curriculum. This field has come to stay in every aspect of government machinery and the business of the private sector. Our students must, therefore, be given a grounding at an early age."

This enlightened thinking was further endorsed when the government took the bold step of completely eliminating the previously existing 25% custom duty on all imported computer hardware. This step was announced on the final day of the Searcc '82 conference and received rousing applause during the closing ceremonies.

Even without the excise tax, a computer is a more expensive item in this part of the world than in western countries.

Consider, for example, the published price of an Osborne Computer Corp. computer at 7,000 ringgit (Malaysian dollars), which may be converted to about $3,000 — almost twice the cost of the same device sold in the U.S. Recognizing the lower wage structure in Malaysia, at about 50% of the U.S. counterpart, one might conclude that Malaysians really cannot afford the personal computer. Nevertheless, the market is there, and it is growing rapidly.

Disparate Economic Situations

The disparity between the economic situations in Southeast Asia and the U.S. was poignantly emphasized during the conference when a U.S. delegate spoke of the benefits of office automation. A member of the audience questioned whether automation could be considered cost-effective in that part of the world where, in general, clerical labor and office space may be had for only 20% to 50% of the U.S. scale, while the hardware carries a 150% to 300% premium.

This economic disparity, although it seems to negate all arguments customarily advanced for computerized clerical routines, does not seem to diminish the interest of this region in computing or the commitment to aggressive pursuit of its benefits.

But there are limits, and the most stringent limitation is imposed by the dearth of well-trained and experienced personnel. There are, today, about 2,000 DP professionals in Malaysia; about 25% of them are affiliated with the Malaysian Computer Society. Hence, important topics at the conference were computer training and increasing users' productivity.

The minister of science, technology and environment, in his opening speech at the conference, addressed this problem and stated that Malaysia is short of 5,000 DP professionals to fill its near-term needs. This means that Malaysia needs to increase its number of trained DP personnel by a staggering 250%!

Important Issues

Programming productivity enhancement tools and higher order languages are, therefore, important issues that are now receiving attention. The marketplace for application software, data management and word processing systems is now in the limelight.

Malaysia is a particularly good market opportunity for word processing systems for two reasons. First, English is the important language used in commerce. Second, the native language, Malay, shares the same Latin alphabet, unlike the languages of surrounding nations, which are expressed in ideograms. Evidence of this national interest in computing was seen at the Computer Expo, the largest exhibit of hardware and software ever to have been shown in Malaysia. More than 50 companies, large and small, displayed their wares. The interest of the Malaysian general public was captured by this extraordinary computer caravan, and more than 7,000

(Continued on Page 30)

HUMAN CONNECTION/Jack Stone‡

He Might Not Agree, But He'll Take the Job

There are no moral conflicts with college students these days, at least not when it comes to their assessments of the computer industry. Though critical of merchandising practices, particularly in the mass market, several seniors we recently interviewed do not seem to be so unhappy with them as to reject job offers with computer manufacturers.

The conclusions of Tony Charles, a business major at a large state university, were typical:

"A friend of mine bought her young son a Timex/Sinclair 1000 for a Christmas present with the hope of encouraging him to become interested in computer machinery and, perhaps, someday taking steps toward a career in the field. But before wrapping it, she decided to have a look at the system to gauge the level of difficulty, having had some data processing experience.

"Well, she scanned the so-called 'self-teaching' manual for only a couple of minutes before she seriously considered returning the machine to the retailer.

This is the third article in a six-part series, "Computers and the Collegians," coauthored with Joanne Barker.

" 'If I can't get through the text, there's no way my son will,' she told me."

Setting It Up

"I borrowed the machine and, with my father's help, set it up. He's a long-term user and is familiar with Basic, but is certainly not a professional programmer. It turned out that the text was pretty easy to follow until we hit Chapter 2, which covered the setup of the tape cassette recorder for program storage. We tried for nearly an hour, but SAVE and LOAD would not work. I finally gave up for the day, but my dad continued for another couple of hours until he finally figured out a procedure to calibrate the recorder so it could be used, a subject that was unclear in the text.

"The next morning we slugged our way through the rest of the text, dwelling only on the highlights. The machine was certainly powerful and what we tested worked just fine, except for just one little bug in an obscure program statement. The machine wasn't all that easy to learn Basic on but, in fairness, we attributed a lot of our problems to the poor manual. But my friend was right in her assessment. The text was more appropriate to an experienced professional and a $10,000 micro."

Hard-to-Understand Manual

"Of course, I don't know why they did, but Timex/Sinclair left an impression of unloading 'iron' in the marketplace. They've found a formula for mass-producing an inexpensive hardware item and did a good job of implementing it. But they seem to have cut the budget in regards to an easy-to-understand, easy-to-use manual and thereby made it very difficult for the average buyer to use the machine.

"The problem is that buyers expect the machine to do everything the higher priced micros do and to be just as easy to operate. And this is just not so.

"But I have concerns with other firms as well. For example, $30 for a video game cartridge is outrageous. What happens is that the teenagers get caught up in 'video game fever' and hit their parents up for more and more cartridges, often costing far more than the hardware. One very positive impact of the Timex/Sinclair is that its more realistic prices for cassette programs — about $10 — will tend to drag down the prices of competitive programs.

"Now, I am not suffering with current computer marketing practices. This is, thank heavens, a capitalistic society and firms are obviously free to sell what they want to sell, and buyers are free to buy or not to buy. And when I examine the Timex/Sinclair sales literature, I cannot really say the company overstated the machine in its advertising. If Timex offered me a big job in its Marketing Department, I'd go for it!"

LETTERS

'Back Up in the Stands'

As a long-time DP professional, I have been working hard to handle the personal computer/mainframe technology advance in a philosophical manner. However, I was disappointed with the article "Consultant Sees DP Mystique Disappearing" [CW, Dec. 6].

The article contrasted sharply with the excellent articles: "Do Spreadsheets Mean Micros?," which is from the same issue, and "Micro-CPU Link Eluding DPers [CW, Nov. 8].

The article puts forth what may be tolerated from 15-year-old microcomputer "experts," but responsible corporate management would not allow it from any professional.

In the article, Chuck Tesler of VM-CMS Consulting Services holds the basic premise that massive DP management incompetence exists. This is evidenced by his statements: "The mystique of computing . . . was an intentional fabrication on the part of DP professionals"; "[by going to management information systems (MIS), users get] treated abruptly [and are] subjected to delays"; "DPers will keep their heads in the sand and discard the growth of personal computers"; and he speaks of a growing user "awareness of DP shortcomings."

These statements are not substantiated in the mainstream. There are incompetents in every profession, but the record of success and contribution of the DP profession will stand up to more than this attack.

Tesler's comparison of responses — "On [an IBM] 3081, a four-second delay is considered normal in local mode; 15 seconds for remote locations. With a personal computer you hit a key and you have the information" — is, I think, irresponsible on both sides of the issue.

Whose standard is the four-second 15-second 3081 response? It is certainly not any generally accepted service-level standard. An instant response from a personal computer assumes the data base is available, some setup beforehand or programming has been done and the detail data for the analysis does not have to be laboriously keyed.

Tesler's economic analysis also indicates a lack of understanding of the basic business need to make a profit in order to stay in business.

His credibility as a consultant is seriously impaired by statements such as: "A company does not take any risk or need to justify heavy investments by turning to personal computers . . .; if a microcomputer breaks down, [user department heads] simply go out and buy a backup for under $3,000"; "There are no longer any economic sanctions against the user computing in any way he wants to do it"; and "[a user dissatisfied with MIS will] simply go to the retail store and set up his own system."

I do agree with Tesler, however, when he says that DP managers in large corporations should, therefore, be attempting to position their companies to make the best combination of micros and mainframes. In fact, I accept this task.

I would also like to reemphasize the importance of a standard DP management task, namely, weeding out spectators from the true professionals.

I say, "Back up in the stands, Tesler."

John R. Morrison
Systems and Programming Manager
The Advanced Mortgage Corp.
Southfield, Mich.

Southeast Asia And Computing

(Continued from Page 29)

people viewed the exhibits.

The conference and exhibits were excellent. In organization and detailing, this conference easily equaled other professional conferences run by organizations with many more years of experience.

As a final overwhelming touch, this overseas speaker was presented with a miniature Keris Berlok as a token of thanks and esteem. This replica of the traditional Malay weapon of defense was offered "as a mark of respect for one who has shown outstanding courage, strength and discipline in managing the reins of progress and development in the computer field."

With that kind of treatment, I'll certainly want to go back to visit Malaysia again.

Werner L. Frank is an independent consultant and president of the W. L. Frank Computer Group located in Calabasas, Calif.

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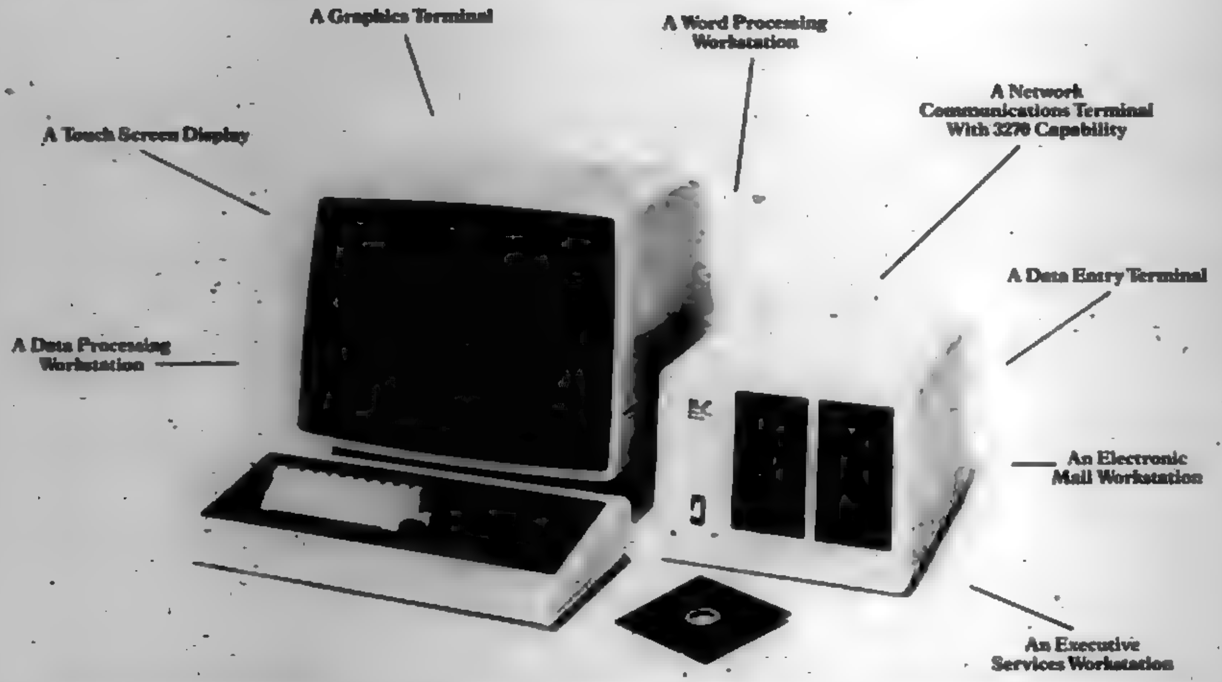
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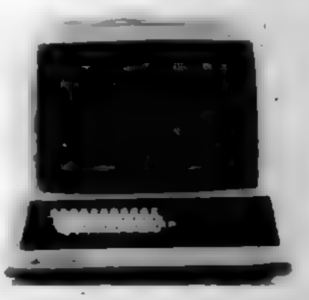

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Tominy Extends Data Base-Plus For IBM Systems

By Lois Paul
CW Staff

CINCINNATI — Tominy, Inc. last week rounded out the line of IBM systems supported by its Data Base-Plus data base management and application development software when it announced that the product now runs on the IBM 4300 series of mainframes, the System/34 and the Personal Computer.

The software was previously available only for the IBM Series/1 running under CPS. Tominy last week enhanced the package so that it now also runs under the Series/1's EDX operating system and supports the Data Base-Plus Programming Language.

Data Base-Plus provides application

(Continued on Page 32)

Consultant: IBM's ADF Either Loved or Hated

By Steven Pfrenzinger
Special to CW‡

Roughly five years ago, IBM offered a new installed user product called the Application Development Facility (ADF) which could generate IBM 3270-based applications in the IMS Data Base/Data Communications (DB/DC) environment.

Accompanied by confusing documentation and inadequate training, ADF hit the marketplace. Some of the early users reported substantial productivity gains, while others struggled with the simplest of applications.

Well, here it is four releases later and IBM has just released ADF II; and guess what? It is finally a fully supported program product with major enhancements, a whole new set of manuals and training tools. Thank you, IBM!

Let's reminisce for a while. From the early days of ADF and up to the current Release 1.3, you would find three basic opinions of ADF: those who love it, those who hate it and those who knew nothing about it. We will examine these opinions a little closer.

First, those who hate it. The IBM-supplied training certainly did not prepare you for using ADF, and the manuals were of little help. It had a list of confusing operands. It offered a fairly straightforward approach to generating a skeletal version of an on-line transaction. But just try to add a little logic to this skeleton program and you would see why programmers were resisting ADF.

The moderate to complex logic requirements were sticky going because of a field-level approach to triggering transaction logic. This technique had the programmers writing logic routines unique to each field processed in a transaction. These routines were then triggered at execution time by a series of operands that controlled the timing of execution, and whether the logic was to be performed

(Continued on Page 34)

Based on Goal's 'Phoenix'

Deltak to Offer Free CBT System

NAPERVILLE, Ill. — Deltak, Inc., a publisher of multimedia and computer-based training (CBT) programs for the DP industry, has announced it will offer a free presentation graphics system based on Goal Systems International, Inc.'s Phoenix CBT software system.

The Deltak Phoenix Presentation System (DPPS), which will be offered at no charge to its current customers, will allow users to run only Deltak CBT courseware, the vendor said.

The offering is part of Deltak's adoption of Goal's Phoenix as its standard authoring and presentation system. Deltak announced it will develop its own courses using Phoenix for both IBM mainframes and IBM Personal Computers. The firm will present its existing Deltak IIS/Deltavision courses that currently are based on IBM's Interactive Instructional System software on the Phoenix system.

The free presentation system, which runs on IBM mainframes, will be available early in the second quarter of 1983. Deltak's next step will be to offer an IBM Personal Computer 3270 emulation capability in September and an IBM Personal Computer stand-alone presentation system in April 1984. The vendor stressed that it will continue to support its customers using the Deltak IIS/Deltavision courses on mainframes and Micro/Deltavision courses on Apple Computer, Inc. Apple II

(Continued on Page 36)

'Auditec' Gets Cobol Converter

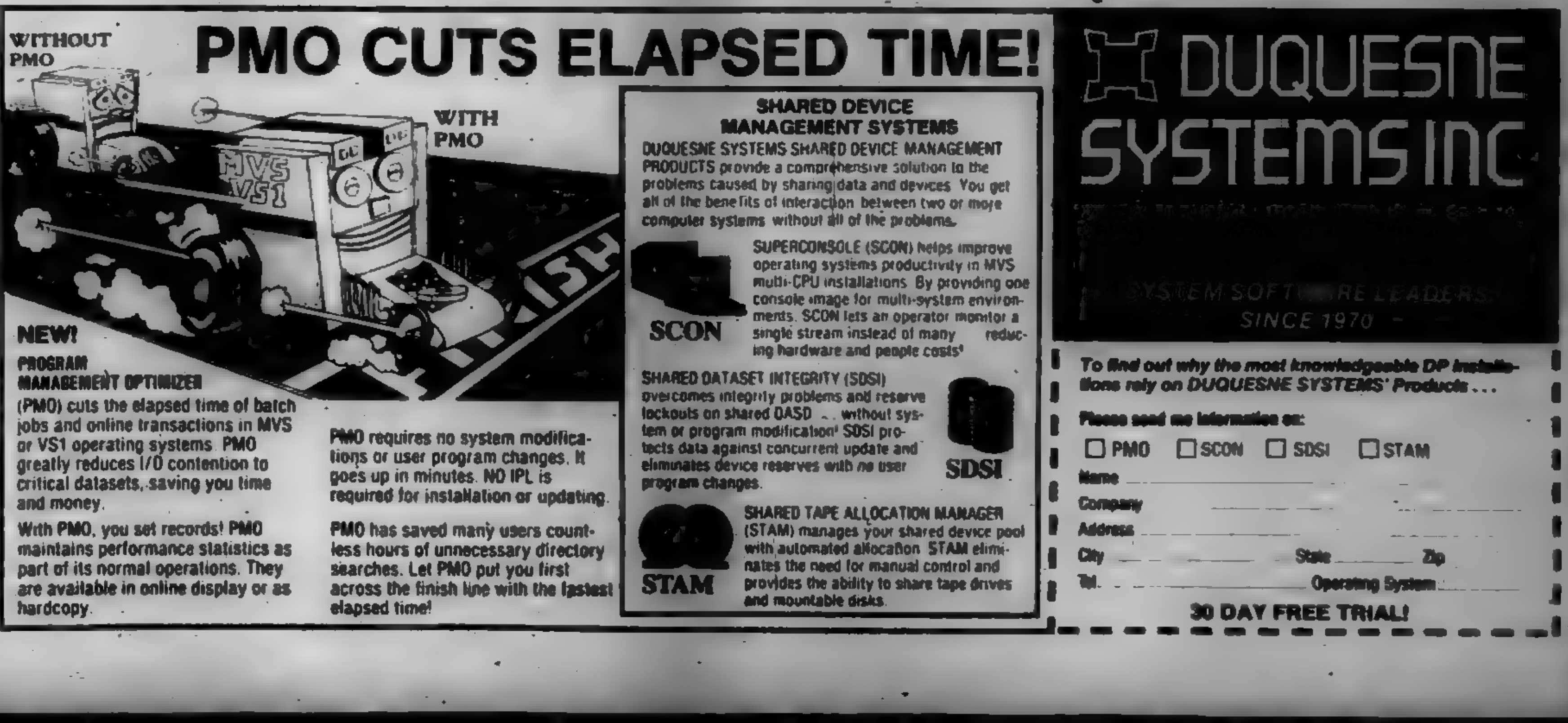
BOSTON — Carleton Corp. has announced that a Cobol file description (FD) Converter and optional interfaces to two data base management systems (DBMS) are included in an updated version of its Auditec Cobol source program generator.

Auditec, which runs on IBM and plug-compatible mainframes and Honeywell, Inc. machines with Cobol compilers, now includes an interface to Software AG of North America's Adabas and Cincom Systems, Inc.'s Total DBMS.

The Cobol FD Converter was designed as an enhancement to the Auditec Data Dictionary. It reportedly allows the user to add record definitions to the dictionary-maintenance program by having Auditec read Cobol source programs and/or copybooks directly. The FD Converter also is said to provide an automatic feature for handling duplicate or otherwise invalid item names. The vendor explained that Auditec will now automatically convert duplicate or illegal names to a legal format when they are added to the dictionary.

In addition to its interfaces to Adabas and Total, Auditec also can access files on IBM's IMS and DL/1 and Cullinane Database Systems, Inc.'s IDMS. The two additional interfaces will operate in the same transparent data base retrieval mode as the previously released interfaces, the vendor noted. Because Auditec was designed to generate the particular data manipulation language necessary to access the data base, the user reportedly can access data base files using the same commands used to read any other file. Simple or multiple record access is available on all Auditec data base interfaces.

Auditec is sold on a license-fee or a monthly rental-fee basis. Its base price is $17,500. The optional interfaces to Adabas and Total are available for an additional fee, from $5,900 to $6,900 each. Carleton is at 44 Bromfield St., Boston, Mass. 02108.



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Compiler Bows for System/34-Prime Migration

By Paul Gillin
CW Staff

PHOENIX — Database Systems Corp. has announced an RPG-II compiler that is said to enable IBM System/34 users to migrate RPG-II programs to Prime Computer, Inc.'s line of 32-bit virtual memory minis.

Escape/34 is aimed at System/34 users who are "dead-ended" by difficulties with system upgradability, a Database Systems spokesman said, adding that these users can migrate to Prime hardware without rewriting existing RPG-II programs. The compiler accepts System/34 RPG-II code and recompiles it for immediate use on Prime's upgradeable hardware.

Products similar to Escape/34 are being sold by other vendors to help disenfranchised System/34 users move to minicomputers from Digital Equipment Corp., Hewlett-Packard Co., Honeywell, Inc. and Wang Laboratories, Inc. IBM is believed to be readying a System/36 for release sometime this year.

The programs recompiled by Escape/34 can be used with the entire range of Prime products, including networking and communications software, and with relational data base management and on-line program development software marketed by Database Systems.

A Prime spokesman said the System/34 was targeted because of its estimated 60,000 installations in the U.S. "Ways to leave System/34 are pretty painful," he added. "It's a 10-year-old architecture with limited program size and memory."

IBM's migration path to the System/38 does not offer increased performance, according to the Prime spokesman, while the Prime offering allows migration up the entire Prime 50 series, from the low-end 2250, which supports up to 32 users, to the multistreaming 850, which handles up to 128 simultaneous users and includes 8M bytes of main memroy.

The product will be available Feb. 15 at a cost of $10,000 from Database Systems, Suite 201, 1846 E. Camelback Road, Phoenix, Ariz. 85016. Escape/34 will also be offered by Prime through its Solutions program, a cooperative marketing arrangement with independent vendors.

'Data Base-Plus' Now Runs On IBM Micro, 4300 Series

(Continued from Page 31)

portability up or down the IBM line, according to Tominy. George Pavloff, the company's executive vice-president and chief operating officer, explained that using the component products of Data Base-Plus "allows the IBM computer user to develop an application system once and transport that application without change to any other computer for which Data Base-Plus is available."

The component products of Data Base-Plus are a data base management system (DBMS), screen handler, print handler, query/report writer, utilities and the Data Base-Plus Programming Language. The DBMS reportedly features a logical structure for defining files; screen and print handlers that manage display or print devices; a Query/Report Writer; utilities; and a high-level programming language designed to integrate the component products and provide one form of data structure expression for programmers.

All of the component products have been implemented for each IBM machine environment, Tominy noted, and logical interfaces to the various operating systems have been designed into Data Base-Plus so the environments basically look the same to the user and the application program.

Data Base-Plus for the IBM 4300, 370 and 30 series of mainframes operates in DOS/VSE, MVS and OS/VS1 with CICS environments. It supports CICS, batch Cobol, assembler and the Data Base-Plus Programming Language and is priced at $39,000 for a single development system and $10,000 for the Data Base-Plus Programming Language.

On the System/34 under SSP, Data Base-Plus supports Cobol, Fortran, assembler and the Data Base-Plus Programming Language. It is priced at $19,500 for a single development system and $5,000 for the Data Base-Plus Programming Language.

For the IBM Personal Computer, Data Base-Plus runs under IBM's PC DOS and supports Basic, Cobol, Pascal, assembler and the Data Base-Plus Programming Language. Pricing is $5,850 for a single development system and $1,500 for the Data Base-Plus Programming Language.

Data Base-Plus for Series/1 machines under CPS or EDX supports Cobol, Fortran, assembler, PL/I, EDL and the Data Base-Plus Programming Language. It costs $19,500 for a single development system and $5,000 for the Data Base-Plus Programming Language.

Volume discounts are available, a Tominy spokesman noted from 4221 Malsbary Road, Building One, Cincinnati, Ohio 45242.

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For Sperry 1100 Mainframes

Release 8.4 of DCD II Unveiled

ROCKVILLE, Md. — CGA Software Products Group, Inc. has announced availability of Release 8.4 of DCD II, the Data Correlation and Documentation system for Sperry Univac 1100 series mainframe-class computers.

DCD II is designed to document Cobol programs and to aid in development, debugging and maintenance efforts, the vendor said. IBM/DOS and IBM/OS versions are also available.

Program-level documentation from DCD II reportedly replaces source and cross-reference listings produced by the Cobol compiler.

The new version includes a verb cross-reference report, which details Cobol verb usage at the program or system level, allowing identification of nonstandard verbs and verbs that will not be supported in Ansi Cobol 80. It also includes an 01 record report which, by summarizing record names throughout an entire Cobol system, helps the user define DCD II control cards.

Priced at $19,500, the system is available from the vendor at 1370 Piccard Drive, Rockville, Md. 20850.

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BIM Bows CICS Tool

MINNEAPOLIS — B.I. Moyle Associates, Inc. (BIM) has announced a terminal data compression program for IBM CICS/VS systems running under DOS/VS, DOS/VSE, OS/VS1 and MVS.

The BIM Compress (BIMCMPRS) compresses 3270 terminal output transmissions by removing repetitive characters, a spokesman said. Reduction in transaction time typically varies between 10% and 60%, depending on the application and data entered. A CRT terminal transaction is provided with BIMCMPRS to display statistics on compression effectiveness during use, the vendor said.

The product costs $1,200 from BIM at 4355 Lyndale Ave. S., Minneapolis, Minn. 55409.

Insci System Targets Erisa

MONTVALE, N.J. — A pension administration system that assists pension managers in Employment Retirement Income Security Act (Erisa) compliance, employee benefits counseling and plan administration was announced by Information Science, Inc. (Insci).

According to the vendor, the Pension Administration System enables pension managers to comply with Erisa by ensuring that all eligible employees become pension plan members as soon as age and length of service and hour requirements are met.

The pension administration system is priced at $45,000, according to a vendor spokesman. It is an option to Insci's Human Resources System, which runs on systems from IBM, Honeywell, Inc., Burroughs Corp. and other vendors and is priced separately. The vendor is located at 95 Chestnut Ridge Road, Montvale, N.J. 07645.

The GE 2120 teleprinter's text editor makes time-sharing unmistakably economical.

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Report Generator Provides Link to 'Soloman'

PHOENIX — Information Systems Consultants, Inc. (ISC) has announced a report generator for Honeywell, Inc. mainframes that provides an interface to ISC's Source and Object Library On-Line Manager (Soloman).

MRS (Management Reporting System) runs on Honeywell Level 66, Level 66/DPS and DPS 8 systems under Gcos III or Gcos 8 operating systems. The menu-driven generator prompts the user for reports and parameters required to produce reports, a spokesman said.

Included are reports listing each project under the Soloman structure; reports listing all programs which changed during a defined period; reports listing programs meeting specific criteria, including programming language, type, associated copy libraries and responsible ownership; reports providing a summary of the number of files residing within each Soloman structure; and reports listing the individual member attributes for each Cobol-74 random library created through Soloman.

Users can determine percentage of completion on a project, amount of time required to develop programs, programs requiring excessive maintenance and programs referencing a common copy library, the spokesman said.

Software requirements include any standard Gcos release; Soloman Release 2.0, 2.1 or 2.2; time-sharing; and appropriate communications software. MRS resides and executes in 15K-byte words of time-sharing memory.

MRS is available on a license basis for $2,500 with an annual maintenance fee of $400 from ISC, located at 6812 N. 19th Ave., Phoenix, Ariz. 85015.

Consultant Lists ADF Pros, Cons

(Continued from Page 31)

conditionally or unconditionally. Later I will describe a very simple technique to replace this one.

ADF is a very powerful tool, but it simply has too many options, too few standards, until recently, and poor documentation and training. It has taken years for structured techniques and standards to evolve that will improve the quality, performance and maintainability of ADF-developed systems.

For those who swear by, rather than at, ADF, there appears to be a similarity of use. Generally, the installations that are having the greatest benefit from ADF have done the following:

- Established an ADF administrator position to control its use.
- Set up standards and procedures that address design, source management, rule generation, move-to-production, testing and so forth. In many cases, these standards enforce the use of a subset of available ADF rule operands and features.
- Created an in-house training course and paid the price of the learning curve.
- Conducted a pilot project at the beginning of every major development effort to acquaint the programmers with ADF.
- Hired an experienced ADF developer to guide the installation's initial effort.

For the ADF installations that are doing all the right things, the productivity gains are impressive. First time developers are reporting 2:1 improvements in productivity and as high as 10:1 on second and subsequent development efforts. The hidden nightmare of maintenance is also reduced. Moving maintenance programmers from one ADF-developed system to another is workable because, architecturally, they are almost all the same and the components are very predictable when changed. In addition, the need for changes is greatly reduced because a major portion of the executed code is contained in precoded and pretested common modules whose correctness have long since been proven.

Benefits Substantial

The benefits of a controlled and standardized use of ADF are obviously substantial and for those who love it, ADF II must seem too good to be true. Its enhancements include a Data Dictionary Extension; IMS/VS 1.2 data sharing support; fast path DB support; multihost environment support; twin segment processing; Cobol support; and screen handler improvements.

ADF is an extremely powerful development tool that if used properly can develop the most complex IBM 3270-based systems currently under consideration, with great improvements in productivity and substantial reductions in maintenance costs.

One notable technique used in two successful ADF development efforts was the elimination of the field-level approach to triggering logic and its replacement with a transaction-level (single trigger) approach to initiating logic. This means that the single field will unconditionally initiate logic at various stages of a transaction (prescreen or postscreen) that pertains to the entire transaction, not just to an individual field. This technique completely eliminated the numerous problems listed before and reduced the learning curve substantially because the concept is simple and more like the traditional programming approach.

Finally, we come to the last opinion, those who know nothing about it. Well, for those in IMS DB/DC development, this number will soon be getting smaller as more and more IMS installations begin, or expand, their use of a product that has finally come of age.

Pfrenzinger, a computer software consultant who specializes in IMS DB/DC applications, is on the staff of IMS Consulting, Inc. in Northridge, Calif.

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IBM Unwraps Updates For System/38 SNA/SDLC

RYE BROOK, N.Y. — IBM has unwrapped a series of communications enhancements for its System/38 that are said to improve its Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) capabilities and to make it compatible with the IBM 3270 CRT terminals.

The firm also introduced a programming enhancement called the System/34-to-System/38 Conversion Aid that reportedly increases the amount of code converted automatically, reducing the amount of user programming required. In addition, IBM announced:

- A high-speed remote line attachment enhancement that permits the System/38 to communicate with an IBM 3705-11 communications controller.
- More than 50 Release 5.0 upgrades for System/38 licensed programs.

The SNA/SDLC capability for the System/38 is provided by a package that permits program-to-program communications between System/38s, as well as between a System/38 and 370 and between 30 series and 4300 processors when running under CICS/VS, a spokesman noted.

Other Enhancements

Other SNA/SDLC enhancements include SNA alert, which allows System/38 operators to notify host computer operators of any system problems, and an upgrade to the System/38's Remote Job Entry Facility (RJEF) that enables the system to operate as a workstation submitting jobs to a host 370, 30 series or 4300 CPU running under the SNA/SDLC protocol. Until now, this capability was only available under Binary Synchronous Communications (BSC).

The 3270 emulation is available via a utility program that lets the System/38 emulate 3270 display stations and printers through its CPF operating system. With the utility, the System/38 communicates with the host as though it were a 3271 Model 2 display station; while its printers appear as 3284, 3286 and 3288 Model 2s.

The emulation capability allows users who have invested heavily in 3270 applications programs to incorporate a departmental or distributed System/38 into their BSC systems easily and less expensively, IBM said.

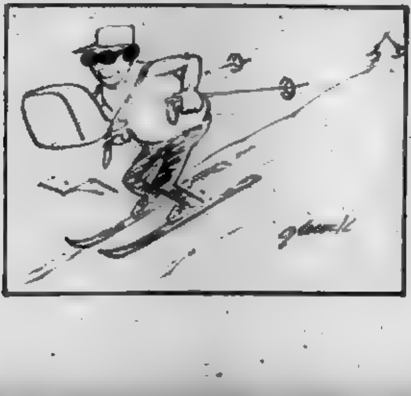
The high-speed remote line attachment enhancement for the System/38 allows it to communicate with an IBM 3705-11 communications controller at 57,600 byte/sec locally or with a 3705-11, 4331 communications adapter or another System/38 at 56,000 byte/sec remotely.

The line attachment feature, which adheres to the CCITT V.35 interface standard, costs $560 and has a monthly lease charge of $20 and a monthly maintenance fee of $5.

Finally, IBM unveiled several Release 5.0 upgrades for System/38-licensed programs.

The System/34-to-System/38 Conversion Aid kit carries a one-time charge of $1,625. The 3270 emulation package and all Release 5.0 enhancements are part of the CPF operating system, which has been increased in price by 10% to $16,500.

All enhancement packages will be available by August with the exception of RJEF, which will be incorporated as part of the CPF operating system, an IBM spokesman said from 900 King St., Rye Brook, N.Y. 10573.



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BIMDSLOG reviews DOS/VS messages without tying up system controls.

BIMSERV displays directories and entries in all DOS/VSE libraries, VTOC's and VSAM catalogs.

BIMMONTR: DOS/VSE System status, performance measurement, POWER/VSE queue and entry CRT display system.

BIMDEVC displays device assignment status.

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Spreadsheet Fits Unix, VAX

PALO ALTO, Calif. — An electronic spreadsheet program designed to operate in the Bell Laboratories Unix environment on Digital Equipment Corp. VAX-11 machines has been developed by Logitech, Inc.

Logiplan was designed as a tool for solving financial and business problems. Logiplan reportedly allows the user to: integrate into a time-sharing environment; temporarily suspend execution to access other features of the system; and split the screen into nine windows.

Also available in French and Italian, Logiplan costs $1,750. More information is available from Logitech at 165 University Ave., Palo Alto, Calif. 94301.

Claims 80% Reduction

Designer Cuts Processing Time

ANN ARBOR, Mich. — Database Design, Inc. has announced Release 2.5 of its Data Designer, said to provide an 80% reduction in processing time compared with previous versions of the product.

Running on systems from IBM, Burroughs Corp. and Sperry Univac, Data Designer is said to help develop data bases by automating the production of Logical Data Models in third normal form from individual user requirements.

The Logical Models are used to design physical data bases for such data base management systems as Applied Data Research, Inc.'s Datacom/DB; Cullinane Database Systems, Inc.'s IDMS; Cincom Systems, Inc.'s Total; and others, according to the vendor.

Existing clients will receive Release 2.5 free. For new customers, Data Designer will cost $30,900 until March 1, when the price will rise to $35,000, a spokeswoman said from 2020 Hogback Road, Ann Arbor, Mich. 48104.

Deltak Offers CBT System Free to Current Customers

(Continued from Page 31)

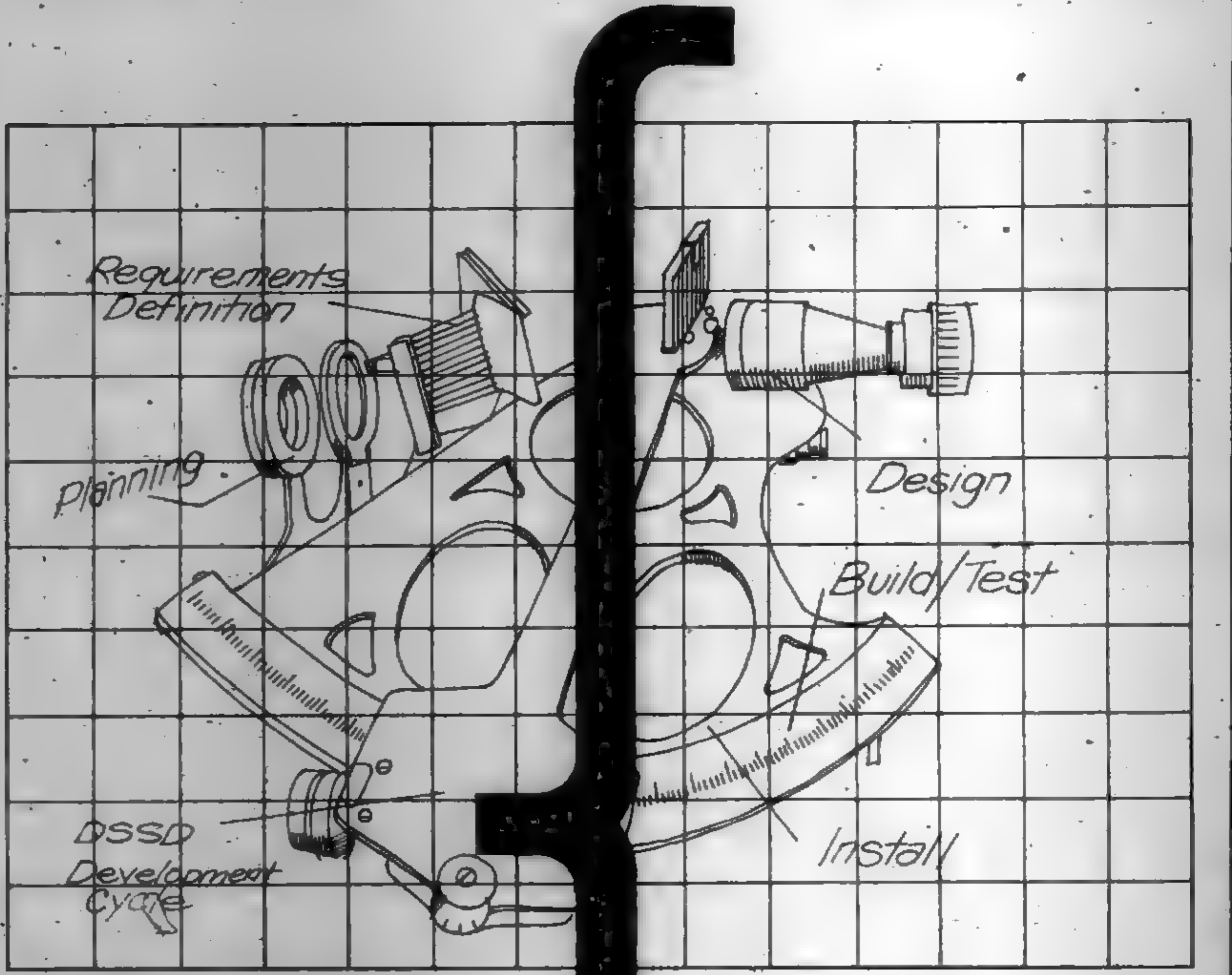
microcomputers.

The DPPS system is intended to enable any DP organization with an IBM mainframe or Personal Computer to use Deltak's CBT/Deltavision library. Formerly, the Deltak courses on the Apple II and IBM mainframes were two completely separate systems.

"Whatever you develop on the mainframe is downward-compatible," according to Rich Ream, vice-president of marketing operations for Deltak. He explained that this will enable Deltak to explore the needs of end users who are making use of information center and application development center tools and who therefore require training on these packages.

Once users bring in DPPS, they can then bring in Goal's Phoenix presentation system to run non-Deltak courses, Ream continued. The Phoenix presentation system will handle any courseware running under IBM's IIS. Then if users want to modify or customize their courseware, they can add Goal's Easy Authoring System for Education (Ease) authoring language, he added.

The Phoenix system, including Ease, will continue to be marketed by Goal Systems, which is based at 5455 N. High St., P.O. Box 29481, Columbus, Ohio 43229. The Deltak Phoenix Presentation System will only be available from Deltak, which is located at 1751 W. Diehl Road, Naperville, Ill. 60566. The courses available via the DPPS system will be priced on a subscription basis, similar to the pricing structure for other Deltak courses.



The Bracket, a navigational tool for software developers

Without proven navigational procedures the great polar ice caps would never have been explored, nor the mighty oceans conquered. System developers today often face unknowns equal to those of yesteryear in developing complex application software. Data Structured Systems Development (DSSD™) is the software designers' sextant for charting the course through the application maze.

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An added benefit of the Stratus fault tolerant design is that you can expand your system with additional processors as your computing needs grow. In fact, you can have up to 32 fault tolerant processors, 2000 communication lines, and 100 billion bytes of storage in a single Stratus system.

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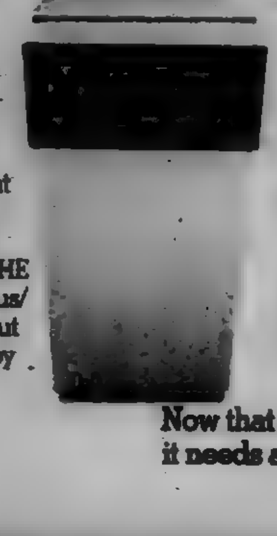

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'Procxref' JCL Utility Gets ICCF Support

SANTA CLARA, Calif. — Software Assistance has added IBM Interactive Computing and Control Facility support for Procxref, a report utility for JCL and catalogued procedures.

JCL statements for IBM DOS/VS(E) installations can be listed, summarized and cross-referenced directly from system or private source statement libraries or from the DOS/VS(E) procedure library. Input from other sources can be processed by using the user exit facility. Exit programs can be generated by using a macro distributed with Procxref.

The utility produces a listing of all procedures selected and a number of cross-reference reports for the different types of JCL statements contained in those procedures, a spokesman said. Cross-references are created for phase names, file names and file identifications. Each report is user selectable and contains all of the categories and formats needed for analysis and control of procedures and job streams.

The program can be initiated from either Sysin or Syslog. Run-time options include the source of input statements, procedures to be selected or rejected and the types of reports and cross-references desired. Global selection or rejection of any or all procedures may be specified. The sort program is loaded and used internally to resequence the information to be cross-referenced.

The utility costs $1,200 from Software Assistance, P.O. Box 2101, Santa Clara, Calif. 95055.

SSP Software Component Released

ANN ARBOR, Mich. — Holland Systems Corp. has released the software component of its Strategic Systems Planning (SSP) product, a methodology for integrating a set of corporate data bases.

SSP software is said to reduce the man hours required to develop the necessary details of a business model.

SSP software runs on IBM or IBM plug-compatible mainframes under MVS. The price for the entire SSP product, which includes the SSP software, education and training, a procedural methodology and software documentation, is $60,000. The vendor is located at 3131 S. State St. S-303, Ann Arbor, Mich. 48104.

Modeling System Debuts

VANCOUVER, B.C. — A menu-driven, fully integrated modeling and reporting system and a spreadsheet program for the VM/CMS operating system in IBM and Amdahl Corp. environments have been developed by Canadian European Systems Ltd.

Dainev is the modeling and reporting system and VZplan is a visually oriented automated spreadsheet system. The products can be used as stand-alone systems or in conjunction with each other.

Dainev/VZplan reportedly can be applied to any spreadsheet format analysis or report. Licenses cost $16,000 (U.S.) with trial periods available from the firm through P.O. Box 2884, Vancouver, B.C., Canada V6B 3X4.

'Xbol' Update Announced

CLEMMONS, N.C. — David Eargle Software Products, Inc. has announced Release 2.0 of Xbol, a programmer productivity aid for Cobol programs operating under IBM 370-era software.

Release 2.0 offers a report writer and will automatically generate file matching and control break logic.

The new release also features automatic generation of program documentation, which consists of sample reports, record layouts and sample on-line screen definitions, the vendor spokesman for the firm explained.

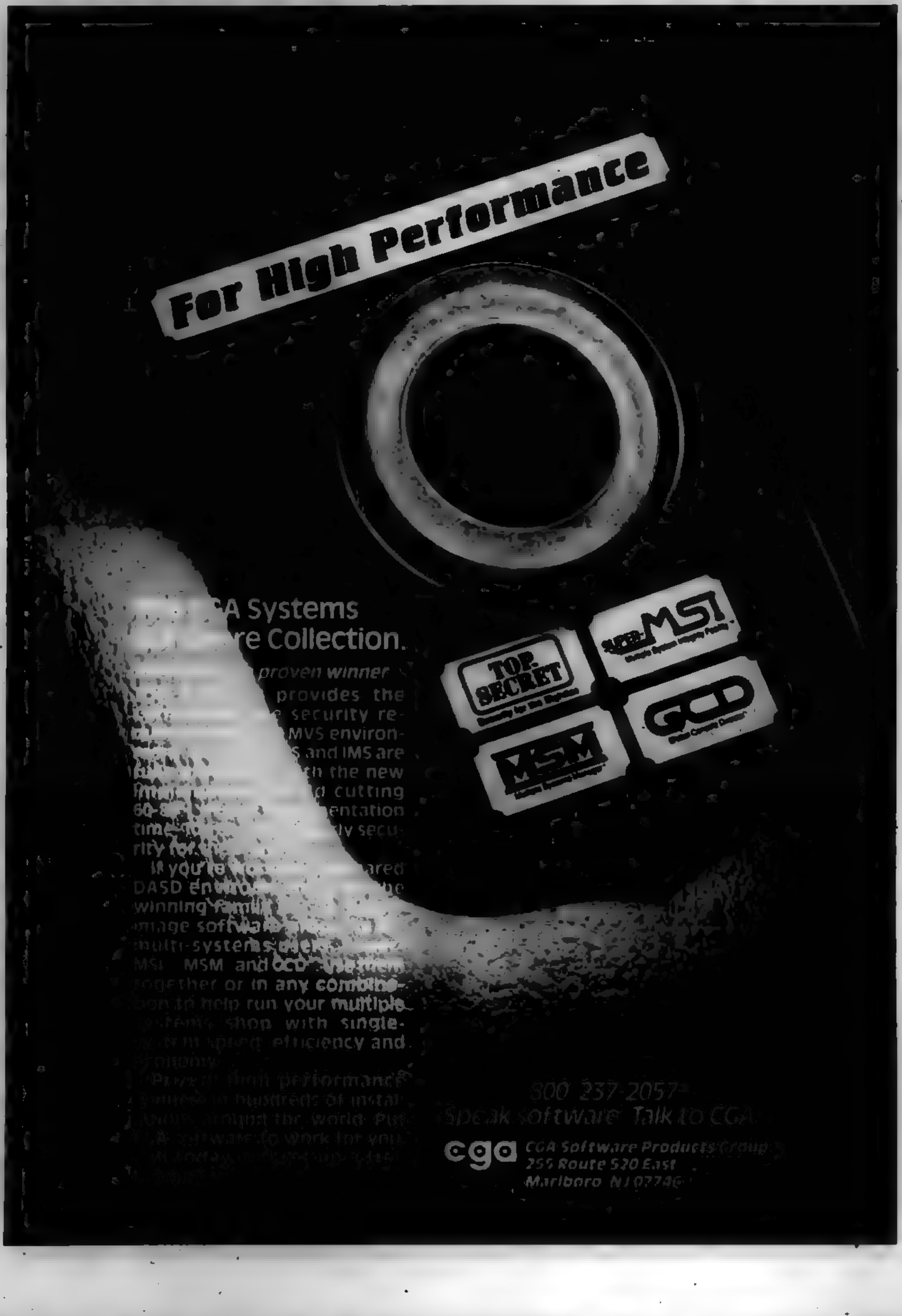
A permanent license for Release 2.0 of Xbol costs $20,000 through P.O. Box 1196, Clemmons, N.C. 27012.

'Action' Version Out For IBM System/38

DALLAS — CTI Limited, Inc. has released a version of its Action general ledger software for the IBM System/38.

The package reportedly includes the capability to define reporting structures to produce reports independent of the account structure, unlimited budget capabilities, multiperiod processing, multiple books including cash and accrual books, intercompany capabilities, level/center concept with parent/child relationship that can vary with the reporting structure, cross-over into the 21st century, native RPG-III, data base and Help screens.

The license fee is $10,000 from Suite 810, 4455 LBJ Freeway, Dallas, Texas 75234.



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For Honeywell CPUs Under CP-6

SIR/DBMS Version Announced

EVANSTON, Ill. — Scientific Information Retrieval, Inc. (SIR) has announced a version of its SIR/DBMS data base management system for Honeywell, Inc. computers under the CP-6 operating system.

SIR/DBMS provides data editing and checking facilities, data security and direct interfaces with statistical packages such as SAS Institute's SAS, SPSS, Inc.'s Statistical Package for the Social Sciences and the University of California's BMDP biomedical package.

SIR/DBMS features a data definition and retrieval language, report generator, integrated text editor and report and table production facilities. Data bases are portable across all computers that support SIR/DBMS, a spokesman said.

A Table procedure is included for displaying data in camera-ready, tabular forms. The procedure reportedly displays frequency cross-tabulations for discrete data and statistical breakdowns for continuous data. Table cell statistics include counts, totals, means, minimums, maximums and others.

SIR/DBMS also operates on IBM and plug-compatible mainframes under OS, TSO and VM/CMS; Control Data Corp. Cyber under NOS and NOS/BE; Sperry Univac 1100 and 90; Digital Equipment Corp. VAX; Prime Computer, Inc. systems; Perkin-Elmer Corp. 32; Siemens Corp.; and the ICL, Inc. 2900 series.

The license fee is $18,000 for the first year with an annual renewal and maintenance fee of $4,650 through P.O. Box 1404, Evanston, Ill. 60204.

Tabulation System Runs on Wang VS Series

ARLINGTON, Texas — Decision Analyst, Inc. has announced an interactive tabulation system for survey research data that runs on the Wang Laboratories, Inc. VS series of computers.

Called Icion, the package is a screen-based, menu-driven, multitasking system that features Boolean logic to define a flash, a stub, a bannerpoint, a table base or a global filter for all cross-tabulations, a spokesman for the company claimed.

Icion produces standard survey research tables and can handle unlimited numbers of respondents, questions and banners. The system accepts single-response, multiple-response and numerical value survey questions.

Wang's word processing can be used to copy, edit and add text to tables created by Icion, the vendor claimed. The system also offers complete stub and banner annotation, univariate statistics, ranking and answer weighting. Summary tables of sums and averages can be created to simplify the analysis of survey data.

The package is priced at $25,000 from Suite 214, 2225 E. Randol Mill Road, Arlington, Texas 76011.

Math Package Offered For FPS-164 Processor

PORTLAND, Ore. — Floating Point Systems, Inc. has announced a library of fast matrix algebra routines for the company's FPS-164 Attached Processor. The processor attaches to Digital Equipment Corp., IBM and Sperry Univac systems for offloading and processing computationally intensive engineering and scientific jobs.

Fast Matrix Solutions Library (FMSLib) routines are coded to allow the FPS-164 to solve matrix problems at the theoretical speed of the hardware, a spokesman said. The routines also use asynchronous disk data transfers to operate on rows of the matrix as if the entire matrix were in main memory. The feature is intended for matrices too large to fit in main memory. FMSLib is divided into four segments. Each can be purchased separately. A permanent license fee for the first segment puchased is $15,000 with each additional segment priced at $5,000.

A segment providing fast utilities for finite element work called Fast Finite Element Library also costs $5,000.

The products will be available in July through P.O. Box 23489, Portland, Ore. 97223.

Tapes Linked To DBMS

ENGLEWOOD, Colo. — Automated Quill, Inc. has announced that marketing tapes such as Dun's Marketing Services tape can now be interfaced with Superenglish IX, its data base management system for Data General Corp. systems.

The software module that supports the interface reportedly allows marketing materials on magnetic tapes to be used by the Superenglish IX product. Superenglish IX incorporates a criteria selection and sort capability followed by report and mailing label generators.

The module costs $950. Further information can be obtained from the vendor, which is located at 3501 S. Corona St., Englewood, Colo. 80110.

VAX-11 APL Introduced

MAYNARD, Mass. — Digital Equipment Corp. has announced an implementation of APL for its VAX-11 minicomputers said to have a theoretical work space limit of 4G bytes.

VAX-11 APL runs under the VMS operating system. VAX-11 APL has a mathematical format and is suited for handling tables and lists in such environments as banking, insurance, laboratory research and engineering.

By integrating VAX-11 APL with the VMS operating system, the new implementation reportedly can read and write sharable files, both sequential and relative, that can be used by programs in other VAX languages.

Other languages include VAX-11 Fortran, Basic, Cobol and C.

The software costs $13,800, according to a spokesman for the vendor. DEC is located at 146 Main St., Maynard, Mass. 01754.

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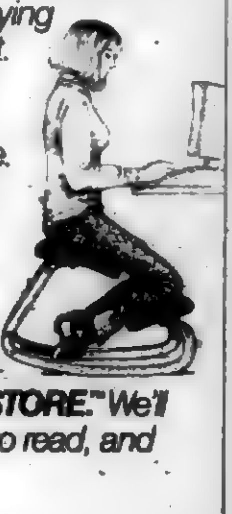

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Receivables Package Out for System/38

JACKSON, Mich. — Alro Computer Software Services has announced an open-item accounts receivable system designed for the IBM System/38.

Receivables/38 is a menu-driven system that reportedly provides complete interactive processing modules for file maintenance, credit inquiry, entering invoices and applying cash received, according to a spokesman for the vendor.

Provisions are made for batch interfacing of invoices from existing billing to order entry systems, according to the spokesman for the vendor.

Reporting functions are available including detailed account statements, aged trial balances and status of accounts, the vendor spokesman maintained.

Receivables/38 is available for a one-time license fee of $3,450, the vendor spokesman said.

Alro is located at 3100 E. High St., P.O. Box 927, Jackson, Mich. 49204.

'Global Limits' Targets Banks

ROCKVILLE, Md. — General Electric Information Services Co. (Geisco) has unveiled a product which helps international banks control their money market and foreign exchange exposure.

The Global Limits System continuously consolidates and updates worldwide limit and exposure information, provides dealers with information on current available amounts under the limits and offers other management information, a spokesman said. Each user defines the type and structure of trading limits. Typical risk areas covered include customer and country credit exposure and foreign settlement risk.

Inquiries can be made on specific limits or the proposed transaction can be entered on a trial basis to determine whether limits will be exceeded, the spokesman noted. If a proposed deal exceeds any limits, further inquiries allow formation of alternative trading options. The system also provides daily reports of countries and customers exceeding their global limits.

The Global Limits System runs on Geisco's Honeywell, Inc.-based Mark III service. A one-time license fee costs $200,000, the spokesman said from 401 N. Washington St., Rockville, Md. 20850.

Icis Service Enhanced

TORONTO — I.P. Sharp Associates Ltd. has added oil, chemical and petrochemical statistics to its on-line data base service.

The new services include *Petroleum Intelligence Weekly* (PIW) Key Crude Prices, PIW Key Crude Oil Production and PIW Spot Product Prices. To access the information, customers must subscribe to PIW at an annual cost of $975.

The Independent Chemical Information Services Ltd. (Icis) data base provides market activity information for chemical and petrochemical product groups, a spokeswoman said. The data can be accessed as a written report or as numeric data. There is no additional charge for the service for current Icis subscribers, but other users must pay an annual charge of from $750 to $1,500, according to the spokeswoman.

Other energy data bases include American Petroleum Institute and U.S. Department of Energy data on production, imports, stocks and consumption of oil and other energy sources, the spokeswoman said.

Charges for use of the I.P. Sharp time-sharing service are $1/hour connect time, 25 cents to 45 cents per CPU and 70 cents per 1,000 characters transmitted or received.

I.P. Sharp is located at Suite 1900, 2 First Canadian Place, Toronto, Ont., Canada M5X 1E3.

'Ansys' Out For Domain

CHELMSFORD, Mass. — Swanson Analysis Systems, Inc.'s Ansys finite element analysis software for engineers is now available for Apollo Computer, Inc.'s Domain Processing System.

Ansys is currently available on Control Data Corp., Cray Research, Inc., IBM and other mainframes, as well as Prime Computer, Inc. and other minicomputers.

The software is said to make possible a choice of types of analysis, material bahavior, loading conditions, nonlinear options and solution procedures. Ansys costs $1,500/mo for less than five nodes and $2,000/mo for five to 10 nodes from 19 Alpha Road, Chelmsford, Mass. 01824.

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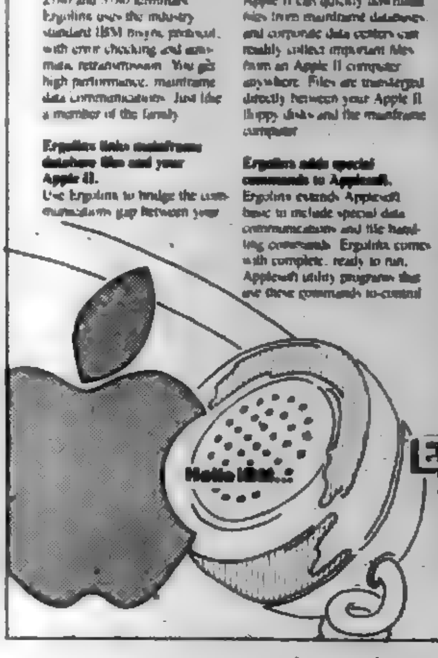

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Random Notes

Real-Time MSP/68000 OS Now Offered 'A La Carte'

BOSTON — Hemenway Corp. is now offering the individual components of its Real-Time Multi-Tasking System Program (MSP)/68000 OS on an "a la carte" basis.

Hemenway offers the following system software components: Nucleus, File Manager, Command Line Interpreter, Device Drivers, Assembler, Text Editor, Linker, Basic and Forth Interpreters, Real-Time Debugger and a range of system utilities.

The price for a real-time data acquisition system, for example, composed of the Nucleus, Real-Time Debugger, Device Drivers and the File Manager is $15,000. The firm is located at 101 Tremont St., Boston, Mass. 02108.

PAC 1, Version 2 Unveiled For DEC's VAX, PDP-11

KING OF PRUSSIA, Pa. — International Systems, Inc. has announced PAC 1, Version 2, an interactive project management system for Digital Equipment Corp. PDP-11 computers running RSTS/E and RSX-11M, VAX under VMS and Decsystem-20 computers running Tops-20.

Pac 1 is designed for project planning and management, resource requirements planning, project budgeting and costing. It includes report writer and printer graphics subsystems.

The software costs $20,000 from International Systems at 890 Valley Forge Plaza, King of Prussia, Pa. 19406.

Automated Claims System Announced for Datapoint

CONCORD, Calif. — An automated claims processing system for Datapoint Corp. computers has been announced by C.R. Wiesner & Associates, Inc.

System V reportedly handles medical, dental, vision, prescription drug, disability and workers' compensation functions. The construction of the data base and support programs is said to give the user the capability to design and maintain processing modules, according to a vendor spokesman.

Through June, the system is being offered at an introductory 50% discount. After that time, the price will range from $150,000 to $250,000, the vendor spokesman said from 1430 Willow Pass Road, Concord, Calif. 94524.

Two Self-Installing Tools Offered for System/23, /34

SOUTHFIELD, Mich. — Intro-Logic, Inc. has announced two self-installing manufacturing packages for the IBM System/23 Datamaster and System/34. Both products come in versions for process and repetitive environments.

The packages cost $5,000 for the System/23 version and $7,000 for the System/34 model. Demonstration packages are available for both versions at $50 for the System/23 and $100 for the System/34.

A discount is offered for quantity purchases, and a dealer program is available for third parties. Intro-Logic is located at 24700 Northwestern Highway, Southfield, Mich. 48075.

Equipment MIS Designed For Fleet Maintenance

WINTER PARK, Fla. — An Equipment Management Information System (Emis) for fleet owners and operators is available from Fleet Management Systems, Inc.

Emis is said to monitor and report on equipment, inventory, fuel, repairs, finances, preventive maintenance and shop productivity. The system reportedly indicates operating costs by the vehicle, the mile, the month and the operator.

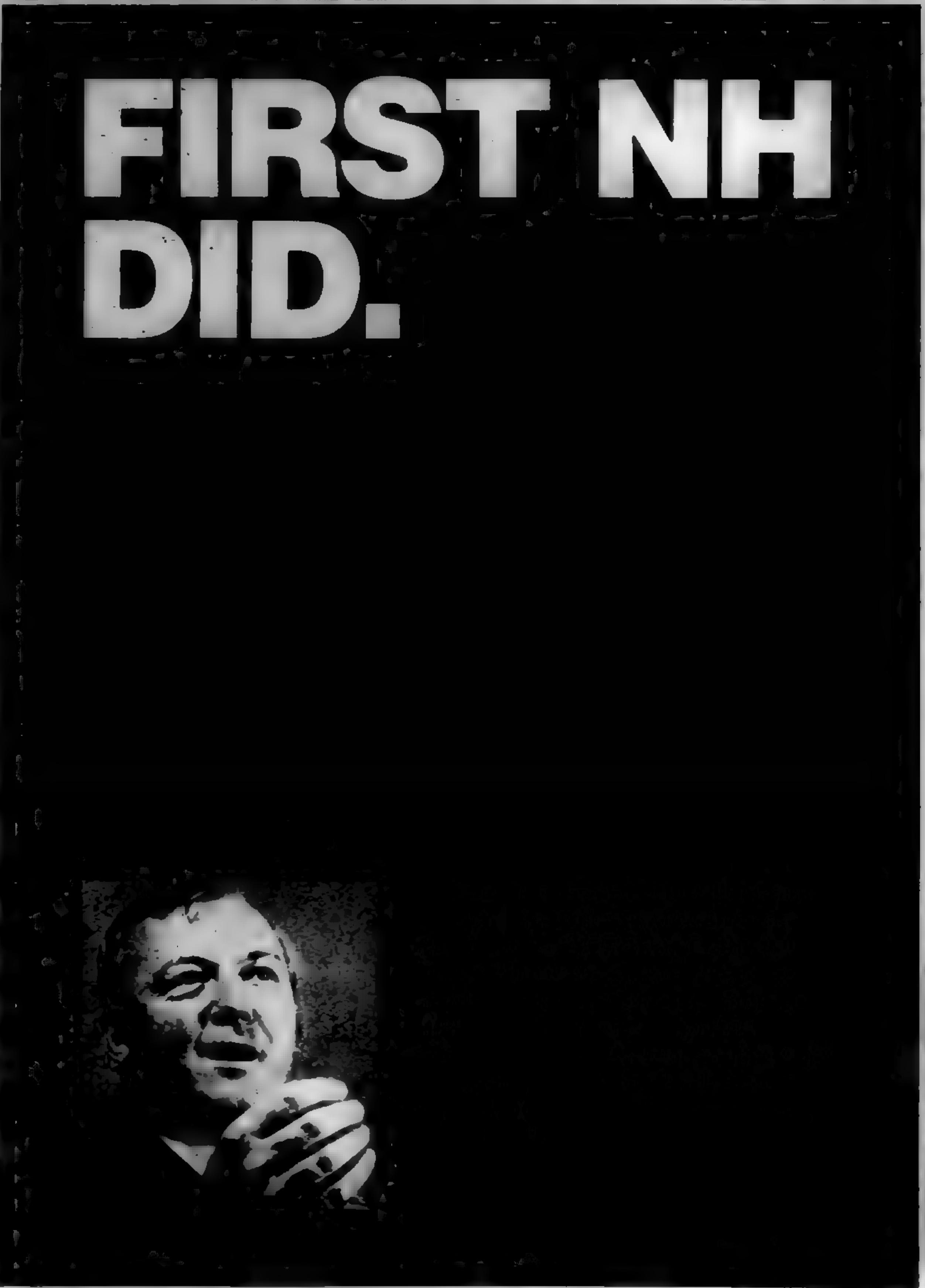
Emis is designed for IBM 370 and 4300 and compatible systems but reportedly will run on any computer with 64K bytes of core memory and a Cobol compiler. Emis costs $50,000 from Suite 200, 147 W. Lyman Ave., Winter Park, Fla. 32789.

ADS' Manufacturers Tool Unveiled for HP 1000, 3000

COLORADO SPRINGS, Colo. — Advanced Data Systems, Inc. has announced the Manufacturers Information Management System (Mims) package for the Hewlett-Packard Co. HP 3000 and HP 1000 systems.

Mims applications include estimating, order processing, production management, inventory control, work scheduling and payroll.

The package costs between $40,000 and $60,000, depending on modules selected. The vendor is located at Suite 105, 3604 Galley Road, Colorado Springs, Colo. 80909.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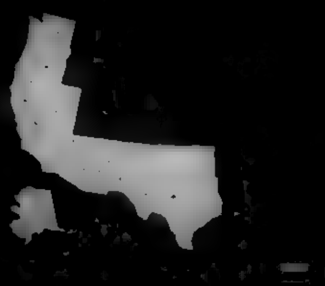
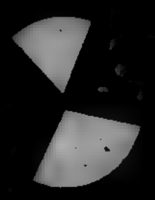


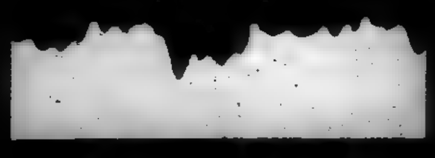
Choropleth Map of Products



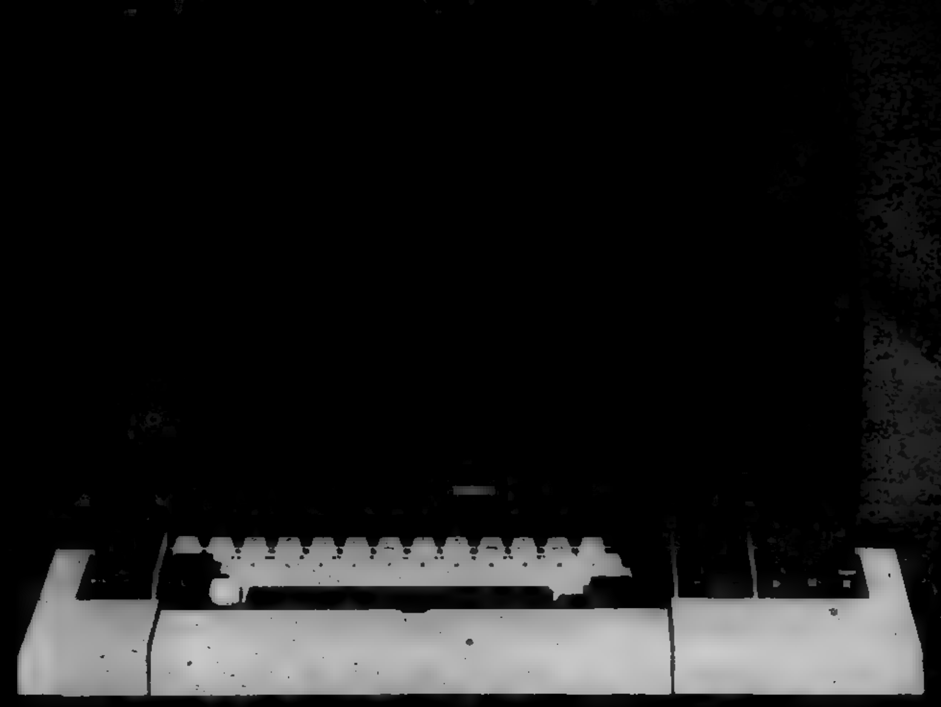
Pie Chart of Revenue

Plot of Funds/Year

Telephone Expenditures



Plot of Load Time



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SAS Software Pty. Ltd., Level 60, MLC Center, 19-29 Martin Place, GPO Box 4345, Sydney, NSW 2001, Australia. Phone (02) 235-2199. Telex AA 71499.

Micro Notes

Visicorp has announced **Visicalc Advanced Version**, a second-generation electronic spreadsheet program for the IBM Personal Computer and Digital Equipment Corp. Professional Series microcomputers. This product reportedly allows managers to create sophisticated preformatted spreadsheet models. It is priced at $400, the vendor said from 2895 Zanker Road, San Jose, Calif. 95134.

Chase Econometrics/Interactive Data Corp. (CE/IDC) has announced two software offerings designed to ally mainframe power with personal computers. These products, which operate on microcomputers from IBM and Apple Computer, Inc., are called **Financial Xchange** and **Microforma Xchange**. The former reportedly allows research analysts and portfolio managers using spreadsheets to access CE/IDC's Analystics securities data base; the latter is a service that provides access to balance sheet and income statement information from over 7,000 publicly traded companies. They are priced from $450. The vendor is located at 486 Totten Pond Road, Waltham, Mass. 02154.

Software Innovations Visual Calculator is a table manipulation program that features a visual worksheet of up to 1,000 rows and 32,000 columns. It is compatible with Bell Laboratories' Unix III operating system. It costs $149 from Software Innovations, Inc., 440 Amherst St., Nashua, N.H. 03063.

Intel Corp. has upgraded its Intellec Series-II microcomputer development system with the introduction of **Series-IIE**. The product reportedly incorporates new features that enable the user to make commands with fewer keystrokes. The system costs $12,500, the vendor said from 3065 Bowers Ave., Santa Clara, Calif. 95051.

The C Software Development System is a compiler for the C programming language for Digital Research, Inc.'s CP/M-based microcomputers. It was developed by Elfin System to emit assembly language code for the host microprocessor or other target microprocessors. This system costs $350. Elfin Systems is located at 265 Nogel Drive, Santa Barbara, Calif. 93110.

Venturcom, Inc. has introduced a series of packages for a variety of microcomputers. A version of Bell Laboratories' Unix operating system intended for the IBM Personal Computer is called **Project Viking**. This product is an integrated software package consisting of Venturcom's Venix operating system, an interactive word processing module, the Logix relational data base manager and a graphics package. This product costs $900. **TEQ** is Venturcom's software package for solving technical equations. It is priced at $295. **Sigpak**, a signal processing package, runs under Venix and Unix. It sells for $5,000. **Venix/2** is a version of the company's operating system for use on the Digital Equipment Corp. LSI-11/2 microcomputer. This costs $1,500. Further details are available from Venturcom at 139 Main St., Cambridge, Mass. 02142.

Digital Marketing Corp. has announced **Plan80**, a spreadsheet financial planning system for Zilog, Inc. Z80- or Intel Corp. 8080- or 8086-based microcomputers running on Digital Research, Inc's. CP/M or CP/M-86. It calculates averages, depreciation, internal rate of return and trigonometric functions and includes a what-if capability. Plan80 costs $295 from the vendor at 2670 Cherry Lane, Walnut Creek, Calif. 94596.

Hewlett-Packard Co. has announced a version of the Forth programming language for its HP Series 200 computers. **Series 200 Multi-Forth** runs interactively on the Model 26 and 36 versions and provides an editor, interpreter, compiler, assembler and I/O handlers with 8K to 12K bytes of random-access memory . The basic package costs $1,500 from 1820 Embarcadero Road, Palo Alto, Calif. 94303.

High Technology Software Products, Inc. has announced enhancements to its **Pace** general-purpose estimating package. The Apple Computer, Inc. Apple II version of Pace has been made compatible with Corvus Systems, Inc.'s hard disk, increasing component make-up storage and retrieval capability to up to 2,000 items. Information on individual components that make up the estimate item is also stored and retrieved, a spokesman said. Pace costs $395 and is available through P.O. Box 14665, Oklahoma City, Okla. 73113.

A simulation program for the Apple Computer, Inc. Apple II, IBM Personal Computer and microcomputers using Digital Research, Inc.'s CP/M operating system has been announced by Applied I. **Twente University of Technology Simulator (Tutsim)** is an engineering design tool that models continuous systems and displays the results numerically or graphically. Apple Tutsim costs $375, CP/M Tutsim costs $400 and IBM PC Tutsim costs $475 from Applied I at Suite 205, 200 California Ave., Palo Alto, Calif. 94306.

Micro Notes

The Computer Co. has announced the availability of its **APL.68000** interpreter on three 16-bit microcomputers, including Instrumentation Laboratory, Inc.'s Pixel 100AP, Corvus System, Inc.'s Concept and Forward Technology, Inc.'s Gateway Work Station. APL.68000 is an implementation of IBM's APL.SV with enhancements. The suggested retail price of the interpreter is $2,000 from the vendor at 1905 Westmoreland St., Richmond, Va. 23230.

Cybersystems, Inc. has announced an extended Forth dialect for Zilog, Inc. Z80- and Intel Corp. 8085-based systems running under Digital Research, Inc.'s CP/M operating system. The **Cyberforth** program development package includes built-in industrial hardware I/O drivers for Cybersystems analog and digital I/O and communications modules and a real-time multitasking executive. The package costs $300 from 7540 S. Memorial Pkwy., Huntsville, Ala. 35802.

Blue Water Systems, Inc. has announced **Expansion**, a word processing package for IBM Personal Computers with Epson Corp. printers. Designed for use with Micropro Corp.'s Wordstar word processing package, it costs $39 through P.O. Box 1877, Oceanside, Calif. 92054.

Mark of the Unicorn, Inc. has announced **PC/Intercom**, which reportedly provides interactive communications functions for IBM Personal Computers. The package features high-speed emulation to Digital Equipment Corp. VT100 CRT terminals. The package costs $99. Mark of the Unicorn can be reached through P.O. Box 423, Arlington, Mass. 02174.

Softcorp International, Inc. has announced **Speedstat Volume 1**, a statistical analysis package for Apple Computer, Inc.'s Apple II or Apple I Plus processor with 48K bytes of main memory. The package costs $250, Softcorp said from 229 Huberville Village Blvd., Westerville, Ohio, 43081.

Selnar Corp. has announced **SGplot**, a graphics package for users of Digital Research, Inc.'s CP/M and MP/M operating systems. The package costs $450, the vendor said from 437A Aldo Ave., Santa Clara, Calif. 95050.

Digital Equipment Corp. has announced 13 software packages developed by various vendors that can be used on DEC's Professional 300 series of personal computers. Packages include a variety of applications aimed at helping small businesses, office managers, engineers, students and system designers, DEC said. The packages cost between $250 and $1,000. Further information is available from DEC at Maynard, Mass. 01754.

Graphic Communications, Inc. has announced a version of its **Graphwriter** business software package for the IBM Personal Computer. The package is available in two format sets — a Basic set and an Extension set. Each costs $395, and both sets are available for $750. The vendor is located at 200 Fifth Ave., Waltham, Mass. 02254.

Smart Systems, Inc. has announced **Smartscreen**, a screen development aid for users of Apple Computer, Inc. processors with a Pascal compiler. The package costs $75, the vendor said from 499 Sulkey Lane, Frederick, Md. 21701.

Acquis Data, Inc. has introduced a communications program for the Altos Computer Systems, Inc. 8000 series microcomputer running under Digital Research, Inc. CP/M 2.2 or MP/M II. **Intercomm** was designed to transfer both text and binary files to or from the Altos and another CP/M-based computers. Intercomm costs $175 from 17192 Gillette, Irvine, Calif. 92714.

Persoft, Inc. has announced two terminal emulators for the IBM Personal Computer. **TE100 Version 1.1** is a full-featured emulator of Digital Equipment Corp. VT100, VT101, VT102 and VT52 terminals. **TE100-FT** is an extension of TE100 1.1 said to add bidirectional file transfer capabilities. TE100 1.1 costs $125 plus $3 for shipping and handling. TE100-FT costs $150 plus $3 from the firm at 2186 U.S. Highway 51, Stoughton, Wis. 53589.

A three-dimensional spreadsheet program for the Commodore Business Machines, Inc. CBM 8032/8096 and the Commodore 64 is available from

(Continued on Page 46)

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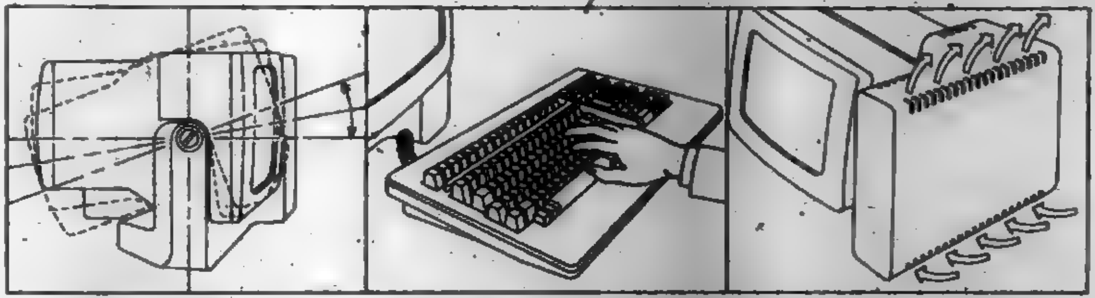

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(Continued from Page 45)

Computer Marketing Services, Inc. **Calc Result** is currently available for the 8032/8096 at $199 and will be available in February for the Commodore 64 using a disk drive at $150. By March, it will be available for the 64 using a cassette drive at $70. The firm is located at 300 W. Marlton Pike, Cherry Hill, N.J. 08002.

Micro Notes

Radio Shack has announced software designed to allow the creation of a personalized electronic filing system using the TRS-80 Model III. **Profile III Plus** reportedly allows storage of up to 2,000 one-segment, 100-char. records. The disk software costs $199. Also from Radio Shack is a disk word processing program for TRS-80 Model I/III microcomputers. **Superscripsit** costs $199 at Radio Shack Computer Centers and participating Radio Shack stores and dealers. The vendor is headquartered at 1800 One Tandy Center, Fort Worth, Texas 76102.

A spreadsheet system called **Finanser+**, written in Ryan-McFarland Corp. RM/Cobol, is available from Datamate Co. It will run in 16-bit mode on the Radio Shack Corp. TRS-80 Model 16's Motorola Corp. MC68000. It costs $395, a vendor spokesman said from Suite 101, 4135 S. 100th E. Ave., Tulsa, Okla. 74145.

Graphics Processing System software for Apple Computer, Inc. Apple II+ computers was unveiled by Stoneware, Inc. The software is priced at $179, according to the vendor at 897 Independence Ave., Mountain View, Calif. 94043.

Sort/PC, a disk sort/merge utility specially optimized to run on the IBM Personal Computer, was recently released by Icon, Ltd. Sort/PC can be used on any IBM Personal Computer configuration with a minimum of 64K bytes of random-access memory and two floppy disk drives. Sort/PC is available for $67. Icon can be reached through P.O. Box 57380, Washington, D.C. 20037.

A Digital Research, Inc. CP/M-compatible implementation of the Databus programming language is available from Sunbelt Computer Systems, Inc. **SunDB80** implements Isam through a full B-tree indexed file system that includes features such as reusing of deleted record space, read key sequentially forwards and backwards, multiple indices and self-balancing indices that eliminate the need for reorganization of the index file. SunDB80 is available for $995 from the vendor at Sunbelt Center, 2455 E. 51st St., Tulsa, Okla. 74105.

A **communications package** for the Apple Computer, Inc. Apple II using the Hayes Microcomputer Products, Inc. Micromodem has been introduced by Micro-Ed. The package includes uploading, downloading and dial-up programs as well as text preparation programs in uppercase or lowercase. The package is priced at $150 from the vendor at 31 Marshall Drive, Edison, N.J. 08817.

A **full-screen editor** for programming on the IBM Personal Computer is available from Personal Systems Technology, Inc. Priced under $100, the screen editor is available from the vendor at 22957 La Cadena, Laguna Hills, Calif. 92653.

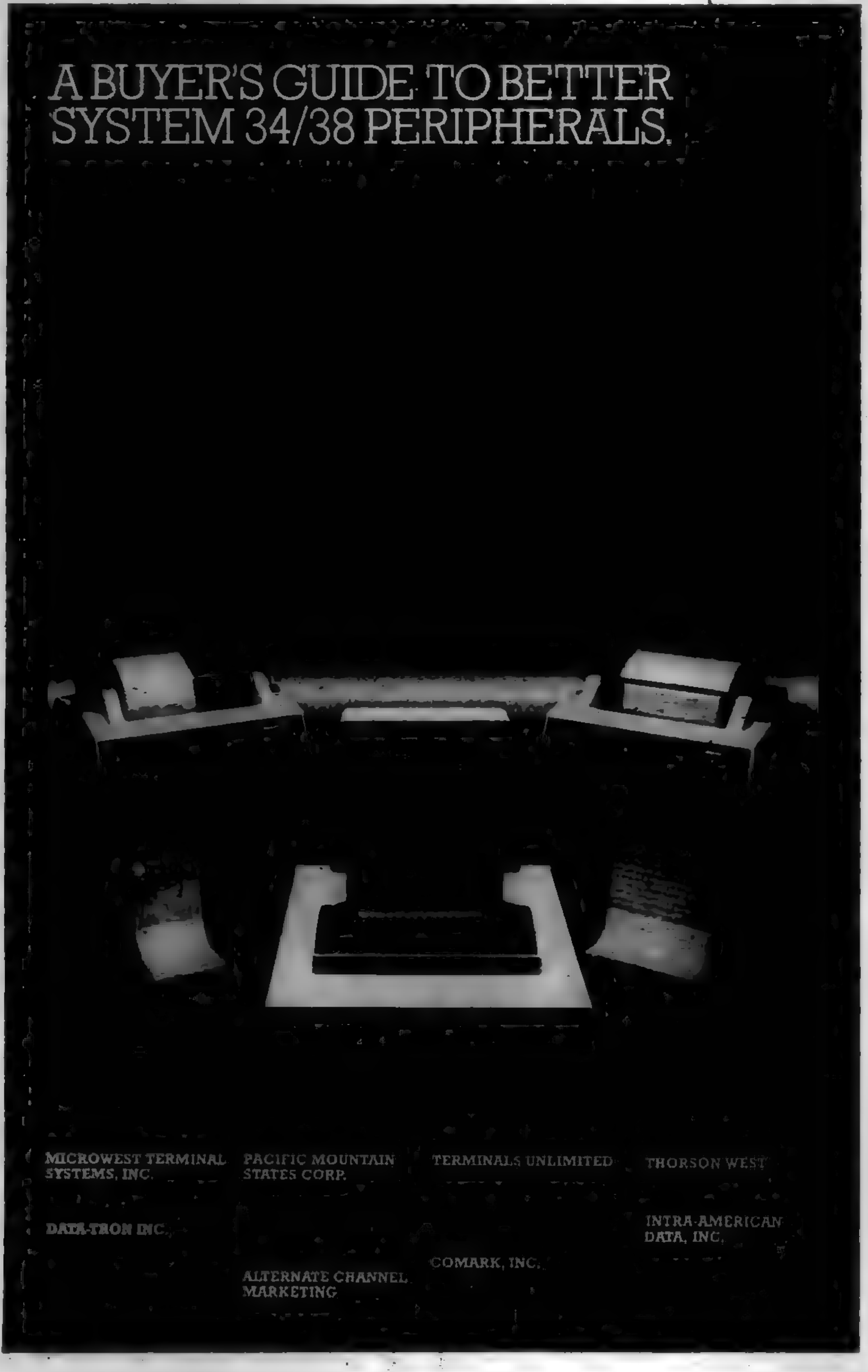
Microcomputer training products, designed to teach first-time computer users and their staff how to use microcomputer software, are available from Merchants House, Ltd. Interactive and audio formats train newcomers how to learn the features of Digital Research, Inc.'s CP/M operating system, IBM's PC-DOS operating system, Visicorp's Visicalc and other products. Priced below $100, the programs are available from Merchants House, Suite 204, 1181 Chess Drive, Foster City, Calif. 94404.

The **Wordstar Memory Jogger**, a reference manual from JC Computer Specialists, was designed to help the nonprofessional programmer remember the format of statements, functions or commands. It is available for $10 from JC Computer Specialists through P.O. Box 3465, Federal Way, Wash. 98003.

A program to sort the rows of columns of a Visicorp Visicalc spreadsheet, called **Visibridge/Sort**, has been introduced by Solutions, Inc. Available for the Apple Computer, Inc.'s, Apple II+ and III, the IBM Personal Computer and Radio Shack's TRS-80 Models I, II/16 and III, it is priced at $89. It is available from the vendor through Box 989, Montpelier, Vt. 05602.

A software program is available from Strobe, Inc. **Strobe-hires** plots high-resolution graphics directly from the Apple Computer, Inc. Apple II and Apple III screens. The plotter costs $785, the interfaces are between $85 and $195 and the software costs between $50 and $145. Further information is available from the vendor at 897-5A Independence Ave., Mountain View, Calif. 94043.

A **full-screen editor/assembler program** for the Radio Shack TRS-80 Model III is available from Structured Software Services. It features numerical expressions, character constants and a global search. It is priced at $37.50 from the vendor at 9233 N.E. 269th St., Battle Ground, Wash. 98604.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Step After Dedicated Minis

Users Demanding Local Net Advantages

By Jeffrey S. Wilson
Special to CW‡

Local-area networks connecting personal computers are no longer subject to speculation. As the costs of computing power, communications hardware and mass storage have declined, a growing number of professional computer users have demanded the advantages that local-area network-based systems provide.

Many who have installed and operated this new equipment regard it as the logical step forward from dedicated minicomputers and conventional time-sharing, since it seems to offer only the better features of both of them.

But some users are discovering that certain kinds of applications are difficult to build using the local-area network-based systems they have just installed. They can use conventional file access methods or data base management techniques to manipulate stored data right there within their personal nodes (workstations on the local-area network), but remote access is difficult.

To share data, they must generally either copy large files wholesale, back and forth across the network or designate a node as a data base server and submit access requests to it.

Copying is unattractive because it can tie up a large fraction of some local-area network's capacities, involve long delays, waste disk space and introduce the chance for inconsistency among multiple copies of the same data. The data base server approach avoids these problems by centralizing the data, but it subjects the users to time-sharing's major drawback: As the user community grows, performance plummets since everyone gets in line to use the shared resource.

A truly distributed, local-area network-based data base management system (DBMS) would allow users to access data stored anywhere on the local-area network transparently, as though it were stored locally. This means users would not have to modify their programs if available data were moved to disks located anywhere else on the local-area network. And, as a practical matter, remote data access would have to deliver performance comparable to that of local-data access.

A large data base might include several 100M bytes of on-line storage distributed among scores of disks. For this reason, the local-area network-based DBMS would offer users the same data base access method choices as found on production-oriented, mainframe-based DBMS products.

(Continued on Page 48)

Features Enhanced Voice

Baby Bell Offers Smart Phones

LAS VEGAS — American Bell, Inc. introduced has introduced two smart telephones that can be reconfigured for specific applications.

The Genesis telesystem features add-in cartridges and add-on modules that enable the user to customize and reconfigure the Genesis terminal for each application. Information is displayed on a 20-char., 5 by 7 dot matrix alphanumeric screen.

Initially, three cartridges are being offered which provide enhanced voice capabilities — such as call waiting, call forwarding and continuous redial of busy numbers. An "electronic datebook" cartridge is also planned. The first module will provide random access to a personal phone directory.

Genesis telesystems will be marketed through Bell Phone Centers, beginning midyear, and through Sears Roebuck and Co. as well as other retail stores. The basic unit will carry a suggested retail price of $350; cartridges will cost $29.95 to $49.94 apiece and the module about $250.

The other new American Bell terminal is called the Touch-A-Matic 1600. It does not accept cartridges or modules, has a smaller screen and more limited keyboard than Genesis. Suggested retail price of the Touch-A-Matic 1600 is $149.95.

Touch-Tone Out for System/34

BURR RIDGE, Ill. — Touch-Tone Entry with Voice or Tone Response is now available to IBM System/34 and System/38 users from Access Telecom.

A customer calling from a Touch-Tone telephone is answered automatically by the "voice" of Access (customized by the user). The caller enters his identification and password via the Touch-Tone telephone key pad and reportedly is verified by the System/34 or System/38. The data is then guided through the data entry or inquiry process by voice (or tone) prompting and response. The data is input directly to the host system for on-line manipulation by the user's RPG programs. Data can be received from eight or more telephone lines simultaneously.

Prices range from $14,995 to $25,995 for up to eight voice ports. More information is available from Access Telecom, which is located at 60 Shore Drive, Burr Ridge, Ill. 60521.

Z-Disk Desktop Gets Four Packages

REDWOOD CITY, Calif. — Product Associates, Inc. has introduced four software packages for its Z-Disk Desktop multiuser microcomputer system. The packages are said to be compatible with Digital Research, Inc.'s CP/M operating system.

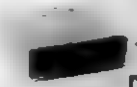
Z-Disk/Hasp is designed to provide communication with any remote CPU that provides support for a Hasp Multileaving Workstation. It is available for $1,495.

The Z-Disk/3780 is an IBM 2780/3780 software emulator package for communication over point-to-point telephone lines with any CPU or device that provides support for specific IBM terminals and CPUs. It is available for $550.

The Z-Disk/3270 is an IBM 3270 terminal software emulator for communication over point-to-point telephone lines with any IBM 360, 370 or 30 series CPU. It is available for $550.

The Z-Disk/Async is an asynchronous communications software package for communication with a mainframe or another microcomputer, available for $195.

More information is available from Product Associates, 465 Convention Way, Redwood City, Calif. 94063.



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HSLD/1 Drives Local Circuits

SUNNYVALE, Calif.— Prentice Corp. announced the availability of a high-speed, synchronous line driver for use on metallic, twisted-pair, Local-Area Data Service circuits.

The HSLD/1, is designed for high-speed, high-density data transmission in either full- or half-duplex modes at switch-selectable rates of 2,400 bit/sec to 19.2K bit/sec. Features include slot transparency, which permits the removal and replacement of the unit without disconnecting interface cables and At-A-Glance diagnostics.

Rack-mountable configurations are priced at $420, stand-alone units are $490 from the vendor at 266 Caspian Drive, Sunnyvale, Calif. 94086.

Offers 17-In. Monochrome Screen

Quadram Unveils Monitor for IBM Micro

NORCROSS, Ga. — A high-resolution, 17-in. screen monitor designed for the IBM Personal Computer has been introduced by Quadram Corp.

The monochrome screen reportedly displays 10,240 characters, said to be five times the screen capacity of the Personal Computer monitor.

Quadscreen reportedly has full IBM PC DOS/Basic I/O Subsystem (BIOS) compatibility, plus added commands for character set determination.

Features include an infinite user-definable character set; standard P4 phosphor screen, or optional P39 green phosphor; dot addressability; super spreadsheet; split-screen functions; driver firmware in read-only memory and a display controller card with 64K bytes of memory.

Priced at $1,950, Quadscreen includes monitor, display controller board, cable and software that reportedly can configure characters of any size or shape. Quadram is located at 4357 Park Drive, Norcross, Ga. 30093.

Users Seek Local-Area Net Benefits

(Continued from Page 47)

Since local-area networks grow in a bottom-up fashion as more and more users connect their own processors, it is awkward to impose traditional top-down data modeling upon them. The traditional approach requires all users to agree upon a single plan (or schema in Codasyl terminology) for the organization of a centralized, shared data base before anyone can use it.

A full-time professional employee called a data base administrator (DBA) is often retained to manage the inevitable negotiation process.

The local-area network-based DBMS would let professional users work the way they want to work. They would be able to design and use their own data bases in processing-power-intensive local applications such as computer-aided architectural design without help from a DBA. Later, they would be able to combine their individual data bases into a shared design data resource. Finally, they might work with a DBA to combine the design data with materials requirement planning data.

At that point, the users would create a valuable bridge of information between research and development and manufacturing organizations within their company. They would access either the entire combined data base or any restricted view by applying the same DBMS tools as they would use to create and manipulate local data bases.

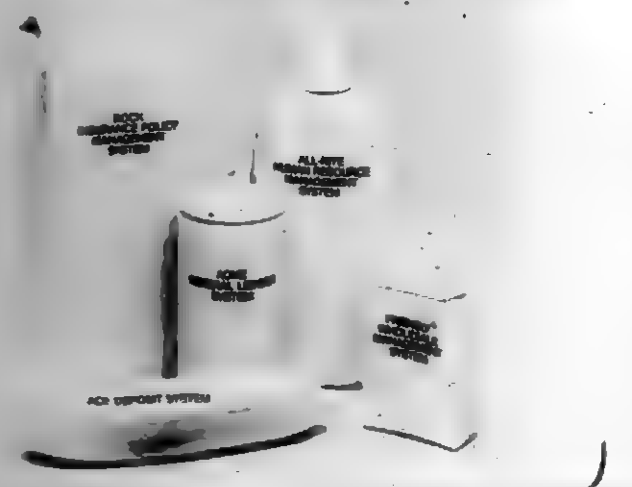
Now, data management technology designed for high-performance local-area networks delivers the benefits of truly distributed DBMS. Individually created and maintained data bases are not being combined by physically merging them into a new data base, for that would only reintroduce all of the copying problems.

Instead, the individual data bases are mapped into a combined data base view, or aggregate schema. Under control of the aggregate schema, a copy of the DBMS software located on one node temporarily copies into main memory via the local-area network only those small portions (pages) of the remote individual data bases that are currently in use.

By accounting for and moving only those particular pages on a demand basis, network traffic is minimized, disk space is conserved and the management of data consistency is greatly simplified.

Wilson is product marketing manager at Apollo Computer, Inc., 19 Alpha Road, Chelmsford, Mass. 01824.

ONCE YOU PICK YOUR PACKAGE HOW DO YOU GET IT RUNNING?



How do you overcome the "not invented here" syndrome? Who selects applications software packages? What criteria do they use? This February 28th Computerworld Special Report on Applications Software will take you from selection to implementation with special emphasis on the issues that become relevant once you get your packages in house.

This special report is going to give you the kind of information you need to get the packages you select up and running. You'll get case histories and applications stories that describe the experiences of users of specific packages. You'll also get tutorial, and non-product-specific articles that will examine different issues and concepts around purchasing and implementing software application packages. Here's the questions you'll get answers to in February's special report:

- **How are canned solutions better than home-grown software?**
- **Is "end-user friendliness" a reality in applications packages?**
- **Conversion: When is it possible? How is it achieved?**
- **How much customization is necessary when installing a package?**
- **How long does it take to get an application package up and running, compared to in-house systems? What is the procedure?**

If you use, buy or need applications software packages, you won't want to miss this special report. Turn to Computerworld next February 28th — and get your packages off and running.

And if you market applications software packages — here's where you'll find your customers. They'll be turning to Computerworld to get all the information they can on what's available and how to make it work. Your ad in this issue will insure them more complete information on the products in the field. Ad close for this Applications Software Packages Special Report is February 11th.

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Sealed Terminal Announced

ETTERS, Pa. — HMW Enterprises, Inc. has introduced a color graphics terminal said to be dustproof, oilproof and watertight.

The HMW 9203 Rainbow is a sealed terminal for use in industrial environments. The front panel is a touch-sensitive membrane keyboard with a clear viewport. Thirteen function keys are located around the viewport with the alphanumeric keys clustered in one area.

Displays may take the form of alphanumerics, character graphics, point, vector and bar-plot graphics in eight colors, the vendor said.

The terminal costs $5,500 from HMW Enterprises, 604 Salem Road, Etters, Pa. 17319.

With Impact-Protective Screen

Terminals Target Hostile Environments

FAIRFIELD, Conn. — A complete line of CRT terminals specifically designed for use in hostile industrial environments was announced by PDS Technologies, Inc.

The PDSTech terminals are designed to operate under adverse conditions of temperature, environment and input power. The terminals are completely sealed within an all-metal housing and have an impact-protective screen. Tactile function keys are also integral to the units, according to the vendor.

The terminals reportedly will operate under severe distortion, transient and surge conditions. Shock and vibration resistance are also incorporated within the unit.

The units are priced at approximately $2,900, depending upon keyboard configuration, interface protocol and memory, through PDS, 2000 Black Rock Tnpk., Fairfield, Conn. 06430.

Four RS-232C Channels Featured On Intelligent Interface Board

DAVENPORT, Iowa — Archives, Inc. has introduced an intelligent serial interface board with four individually programmable, bidirectional, serial EIA/RS-232C communication channels.

The board includes a user-programmable Zilog, Inc. Z80A microprocessor operating at 4 MHZ, 64K bytes of random-access memory and up to 8K bytes of erasable programmable read-only memory. Via a built-in configuration program, the user can specify for each of the four channels the transmission rate (50 to 19.2K bit/sec), parity and amount of memory for both input and output, the vendor said.

The channels can also be programmed so the board will interface the host with up to four unintelligent terminals. Three of the board's four channels support asynchronous protocols, the fourth supports either asynchronous or synchronous protocols.

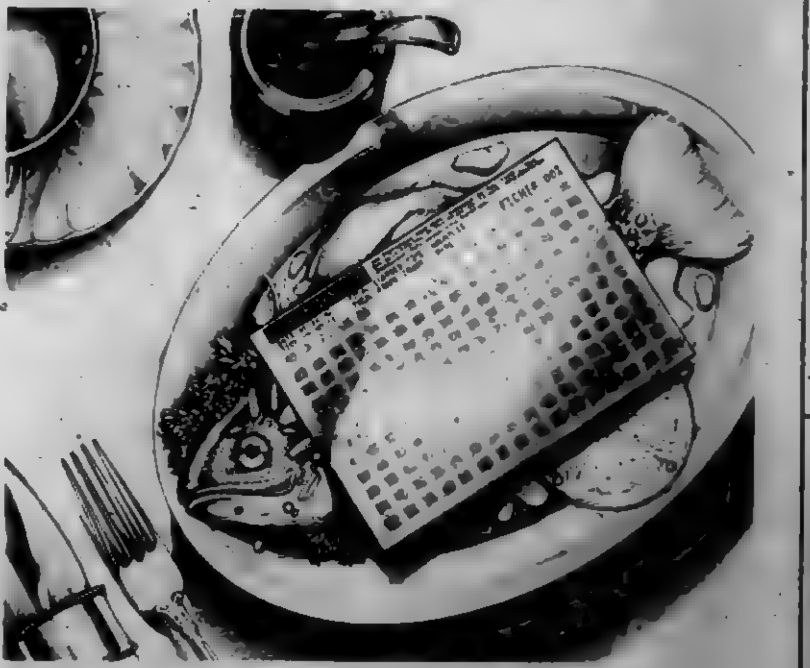
The board costs $695, Archives said from 404 W. 35th St., Davenport, Iowa 52806.

Price Cuts Announced For Concept AVT Line

PHILADELPHIA — Human Designed Systems, Inc. has announced price reductions for its family of Ansi/Digital Equipment Corp.-compatible Concept AVT terminals.

The Concept AVT with four pages of memory has been reduced to $1,295 from $1,575; with eight pages of memory, the unit is reduced to $1,445 from $1,855. Concept AVT-APL terminals have been reduced to $1,495 and $1,645, from $1,750 and $2,030 respectively, according to the vendor.

More information on the reductions is available from Human Designed Systems, which can be reached at 3440 Market St., Philadelphia, Pa. 19104.



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Accepts RS-232C Input

IRC Division Unveils Controller

EL SEGUNDO, Calif. — The Crydom Division of International Rectifier Corp. (IRC) has introduced a controller said to facilitate the use of its single-cable remote I/O system by providing most of the communications programming.

The Model 8105 controller reportedly accepts standard RS-232C asynchronous input from master consoles and generates a standard RS-422 output to remote interface adaptors at individual workstations.

The controller costs $999 from IRC, which is located at 1521 Grand Ave., El Segundo, Calif. 90245.

PABX Gets Remote Aid

GARDEN GROVE, Calif. — Anaconda-Ericsson Communications announced its remote maintenance capability for the Prodigy digital private automatic branch exchange (PABX).

The built-in, dial-up system identifies faults by a series of 10 diagnostic steps that check lines, trunks, common control equipment, system configuration and minor alarm status.

Other system features enable changing directory numbers and class of service by dialing through a standard Touch-Tone telephone, a vendor spokesman said.

Included in the price of the PABX, which is approximately $600 per month, the remote maintenance capability is available from the vendor located at 7465 Lampson Ave., Garden Grove, Calif. 92641.

USI Announces Color Monitor

BRISBANE, Calif. — USI International announced the addition of a 14-in. composite video color monitor to its line of amber and green monitors.

According to the vendor, the 14-in. screen was selected for the new monitor because of the use of the monitors in so many graphics applications.

USI's color monitor eliminates the two-step process of converting the computer's video signal to a form that a television can receive and the subsequent conversion within the television back to a pure video signal.

The new color monitor is priced at $399 from the vendor at 71 Park Lane, Brisbane, Calif. 94005.

Direct Connect Modem, Smart Modems Offered

TARZANA, Calif. — Novation, Inc. has introduced a 300 bit/sec direct connect, autoanswer/originate modem and two smart modems.

The 5-in. by 1.9-in. by 1.3-in. J-Cat plugs into the RJ11C phone jack and can detect a carrier or get a dial tone. Other features of the direct connect modem include a disconnect/test key, connect/break key, self-test and compatibility with RS-232C, a vendor spokesman said.

The 103 Smart-Cat modem is a 300 bit/sec full-duplex modem; the 103/212 Smart-Cat is a 1,200 bit/sec full-duplex modem. Both feature a built-in dialer, autoanswer, direct connect, analog and digital loopback testing and a software command set.

The J-Cat is available for $149, the 103 for $249 and the 103/212 for $595, the vendor said.

More information is available from Novation, which is located at 18664 Oxnard St., Tarzana, Calif. 91356.

TRW-Fujitsu Introduces Internal Modem for 7880

LOS ANGELES — TRW-Fujitsu Co. (TFC) has introduced an internal modem for use with its TFC 7880 Point-Of-Sale Terminal or the 7110 Terminal Support Processor.

The modem transmits at 2,400 bit/sec and can be plugged directly into any standard telephone microjack for use with a switched network system. In addition to answering standard ring signals, the modem can optionally place outgoing calls, a vendor spokesman said. The modem is fully Federal Communications Commission-certified and approved.

The TFC 2,400 bit/sec modem is available for $900 from TFC, Suite 620, 9841 Airport Blvd., Los Angeles, Calif. 90045.

Upload-Download Tool Out

LINCOLN, R.I. — International Data Sciences has introduced a communications software package for uploading and downloading test routines between a host site and field locations.

The Upload-Download ROM-PAC (4030-RP-11) was designed for the IDS Hawk Model 4030 Programmable Datacomm Tester, a field service communications test instrument that features 51 resident features.

The package contains a print routine for printing the complete contents of the Model 4030 program steps and messages, according to a vendor spokesman.

It is available for $275 and the tester costs $3,995 from International Data Sciences, 7 Wellington Road, Lincoln, R.I. 02865.

TI Asynchronous Interface Links Units to Series 600, 800

AUSTIN, Texas — A low-cost asynchronous interface for attaching printers, terminals or modems to its Business System Series 600 or 800 computers has been announced by Texas Instruments, Inc.

The Communications Interface 402 (CI402) provides an interface to two 9,600 bit/sec asynchronous devices compatible with RS-232C or V.24 protocols. The CI402 replaces a single-channel teletype/Electronic Industries Association card.

Compatible interfaces include the Series 300 two-channel interface, the Series 300 processor port and the Series 600 processor port. The interface definition is common to all these interfaces.

The communications interface occupies a half slot in the Business System Series 13-slot chassis. The CI402 is available for $495 from the vendor at P.O. Box 202146, Att: H-641, Dallas, Texas, 75220.

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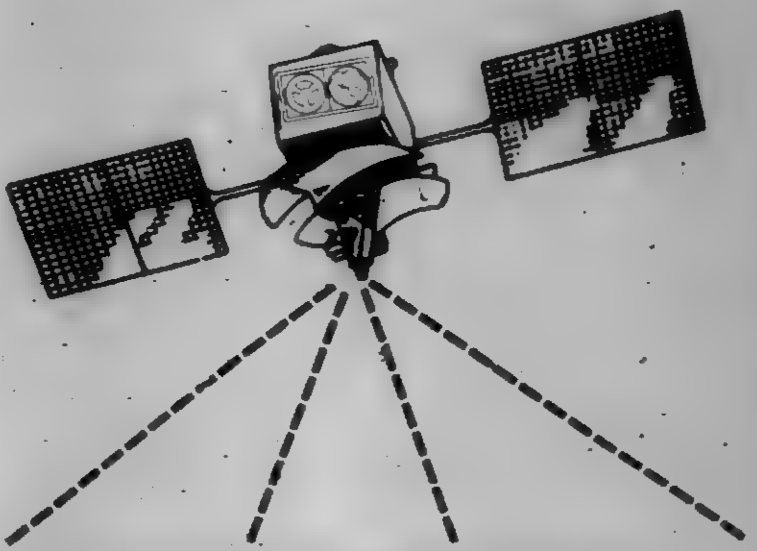

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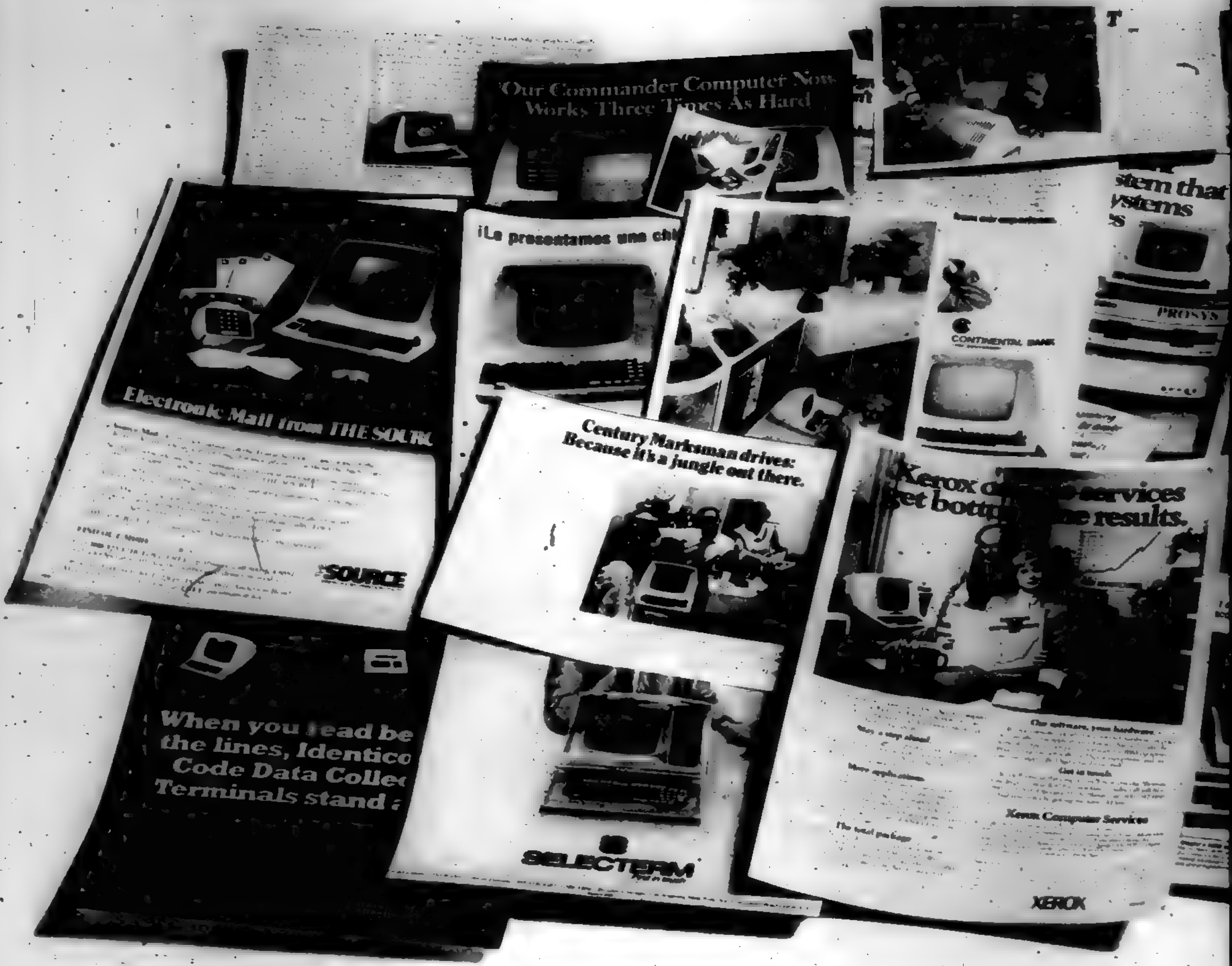

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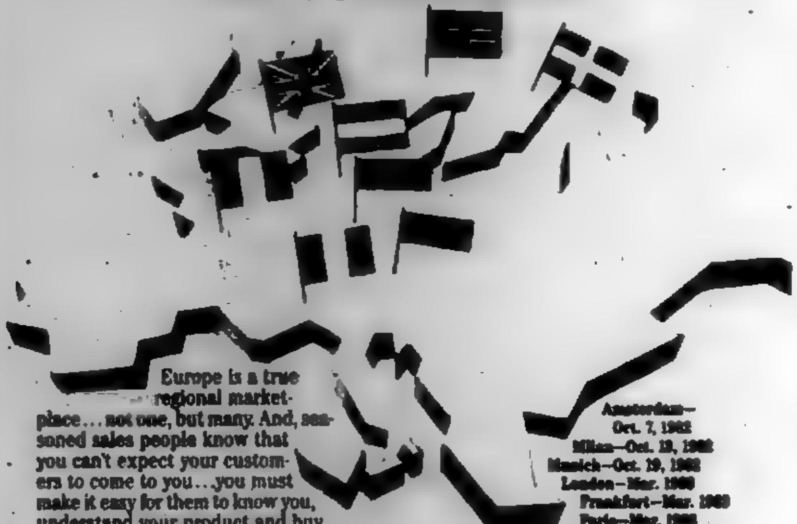

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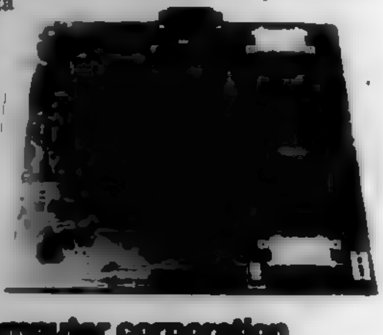

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Identification Terminal Out for Banks With ATMs

SAN JOSE, Calif. — Atalla Corp. has introduced a terminal that reportedly provides financial institutions with customer identification at teller stations using any plastic card at its automated teller machine. The terminal is said to work with any customer code system already in use.

The microprocessor-based All Systems Identification Terminal has a 12-key telephone-type customer key pad, an eight-digit alphanumeric display and three control keys on the teller side. It also features a magnetic stripe card reader that can be used from either side.

The terminal is said to eliminate delays in signature comparison, interbranch telephone calls and other manual customer identification methods.

It is available for $995 from Atalla, 2363 Bering Drive, San Jose, Calif. 95131.

T-Bar Unveils Micro-Based Series Of Fixed-Protocol Data Monitors

WILTON, Conn. — T-Bar, Inc. has unveiled a series of fixed-protocol data monitors for use with synchronous digital data.

The Explorer DM-1 Data Monitor offers autospeed to 19.2K bit/sec full duplex, paging buffer, CRT display with hexidecimal/normal read-out, LED activity indicators and real-time message and error counts.

The unit features microprocessor-based architecture that provides a built-in self-test and firmware-driven protocol/code set with automatic transmission rate detection.

Five models feature the following protocols: IBM's binary synchronous communications, Synchronous Data Link Control/Systems Network Architecture, Pars/Ipars and Xerox Corp.'s X.25.

Each costs $1,895 from T-Bar at 141 Danbury Road, P.O. Box T, Wilton, Conn. 06897.

Data Communications Options Out for Beacon Graphics System

LAKE MARY, Fla. — Florida Computer Graphics, Inc. has announced 11 data communications options said to allow the firm's Beacon color graphics computer system to communicate with any host computer, office system or intelligent peripheral, according to the vendor.

The options include emulation of asynchronous and binary synchronous communications, emulation of IBM Systems Network Architecture/Synchronous Data Link Control devices and Digital Equipment Corp. VT-100 terminal emulation as well as a native asynchronous mode.

Option pricing begins at $300 from Florida Computer Graphics, 1000 Sand Pond Road, Lake Mary, Fla. 32746.

Breakout Box for RS-232 Interfaces Announced by Remark Datacom

WOODBURY, N.Y. — Remark Datacom, Inc. has announced the Model 51, a breakout box for RS-232 interfaces.

The unit gives RS-232 users the ability to reconfigure connections or signal paths. The device is often used when interfacing new devices such as printers and CRT terminals.

Model 51 is equipped with male and female 25-pin connectors. This allows users to place the unit in series with any RS-232 cable, the vendor explained.

The Model 51 costs $37.95, the vendor said. Remark Datacom is located at 4 Sycamore Drive, Woodbury, N.Y. 11797.

Kit Allows Apple, Xerox Micros To Emulate Burroughs CRT

BIRMINGHAM, Ala. — Mid-South Data Industries has introduced a software package said to allow an Apple Computer, Inc. Apple II or a Xerox Corp. 820 or 820 II microcomputer to emulate the Burroughs Corp. TD830/MT983 CRT terminal.

Microbridge/B consists of a terminal emulation module and a micro/host file transfer module. The user can tailor the host file transfer module to match his own system environment, the vendor spokesman claimed.

A monitor mode allows the user to see line activity and determine if his address is being polled.

Terminal status can be displayed on the last line of the screen, the vendor said.

The package is available for $995 from Mid-South Data Industries, Suite 104, 237 Oxmoor Circle, Birmingham, Ala. 35209.

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Hewlett-Packard Unveils Protocol Analyzer Unit

PALO ALTO, Calif. — Hewlett-Packard Co. has announced the HP 4955A, a protocol analyzer that reportedly operates at speeds between 50 bit/sec and 72K bit/sec in a full-duplex mode.

The unit includes 128K bytes of random-access memory for storing data, lead status and timing. By using 63 separate triggers, the unit can simultaneously search for multiple events, the vendor said.

The HP 4955A provides the capability to identify network problems and helps improve network availability, the vendor said.

The protocol analyzer costs $20,950. A Basic language option costs $2,015. Interface pods, which connect the analyzer to a variety of networks, cost $1,110 each.

More information is available from HP, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Test Bed Cable Out From Sytek

SUNNYVALE, Calif. — Sytek, Inc. has introduced Localnet 50/10, a test bed cable kit that reportedly enables customers of Sytek's Localnet to construct inexpensively a simulated broadband local-area network system.

The kit requires a minimum setup space and does not require tools for the connection of its F-type connectors. It includes one splitter, six directional couplers and one 75-ohm terminator, the vendor said.

The kit costs $100. Sytek is based at 1153 Bordeaux Drive, Sunnyvale, Calif. 94086.

Portable Test Set Monitors Data

LINCOLN, R.I. — International Data Sciences, Inc. has introduced a portable, diagnostic data communications test set designed to monitor and communicate interactively with data appearing at the RS-232 interface.

The microprocessor-based Hawk 4010 Datatrap displays data traffic on a 5-in., 512-char. CRT display. Interactive and monitoring capabilities are accessible through menu pages displaying instrument configuration status to guide the user through fault analysis procedures, the vendor said.

It is said to locate and isolate problems in the hardware and software by simultaneously displaying both transmit and receive data.

The 4010 is available for $4,995 from International Data Sciences, 7 Wellington Road, Lincoln, R.I. 02865.

Switch Product Provides ATM Link

FUQUAY VARINA, N.C. — Software Development and Maintenance, Inc. has introduced a switch product for automated teller machines (ATM) that is said to interface directly with its ATM Transaction Control System and IBM's 3624/3614 On-Line Application and Reporting System.

The TCS-Switch's abilities include: integrating switch transactions with local transactions for reporting and posting; clearing fees with transactions or interchanging fees between banks based on transaction volumes; forcing the settlement date to comply with the switch business date; and backing out the transaction amount when exceptions occur.

The switch is available for $10,000 from Software Development and Maintenance, P.O. Box 668, Fuquay Varina, N.C. 27526.

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Data Communications Networks: The Long and Short of It

Edited by Jim Bartimo and Bruce Hoard

January 31, 1983

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An Important Factor to Consider

Risk Must Be Assessed in Net Development

By Ralph K. Melone
Special to CW

Design methodology for communications networks has been documented by a variety of communications companies and notable experts in the field. However, little has been written dealing with risk assessment and risk-return relationships for communications network development projects.

Risk refers to the following:

- Implementation costs that greatly exceed planned levels.
- Technical performance of completed systems that turn out to be far below estimates.
- Incompatibility of the system with selected communications hardware and software.
- Failure to obtain any/all anticipated benefits of the network.
- Time for implementation that exceeds expectations.

Risk is important for a variety of reasons. Designing networks is a relatively new discipline when compared with systems development as a whole. The risk of disaster needs to be minimized.

Three dimensions of a communications network project have significant impact upon the project's risk — size, technical experience and project structure.

Projects with large staffing levels, dollar expenses, elapsed times and many affected users carry more risk than projects with smaller attributes (Figure 1). The level of risk also varies directly with the size of the project as a percentage of the firm's total portfolio budget.

The number of technical considerations required to design a communications network can be overwhelming. The amount of hardware, software and vendors entering and already in the marketplace is increasing at a furious pace.

The level of familiarity of a project team with hardware, software and communications design issues has a strong impact on the degree of risk a project will have. Project risk will increase as the project team's familiarity with technical considerations decreases (Figure 2).

The structure of the network project will depend on how well the organization has defined project tasks and outputs. If the project is highly structured — that is, tasks and outputs are well defined — risk is minimized. Risk is greater when project tasks and goals are nebulous and constantly changing (Figure 3).

The key is not to avoid risk completely, but to minimize risk while maximizing return. A firm with no high-risk projects may be leaving a product or service gap into which competition can step. On the other hand, the firm loaded with high-risk projects may be vulnerable to operational disruptions when projects are not completed when planned.

Risk for large-size projects can be minimized through a variety of techniques. Prioritization of objectives and goals can reduce a project's scope. Project management techniques can be used to monitor both budget and schedule milestones, minimizing surprises.

Risk minimization for projects with little technical experience can take the form of pilot projects. A pilot project can provide experience for project members. Design parameters can be tested and vendor service can be evaluated. Network simulation programs are available for assisting in the design of large-scale multipoint communications systems.

Network and design programs are available for determining concentrator and multiplexer allocation, terminal clustering and economic analysis. Large communications vendors will provide these services to companies once a commitment for hardware purchase has been made. Technical consultants can also be hired.

Unstructured projects, once identified, can be better defined by users if project managers point out the dangers of ill-defined tasks and outputs. Communications network pro-

(Continued on SR/4)

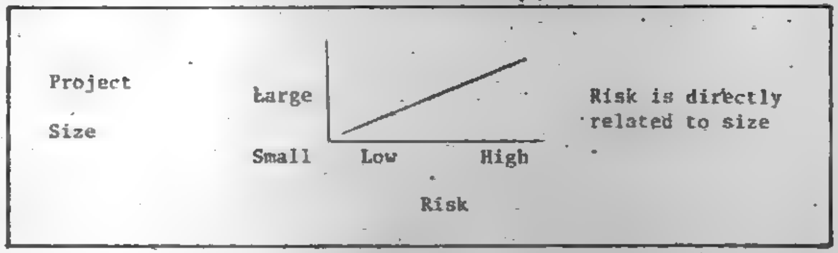
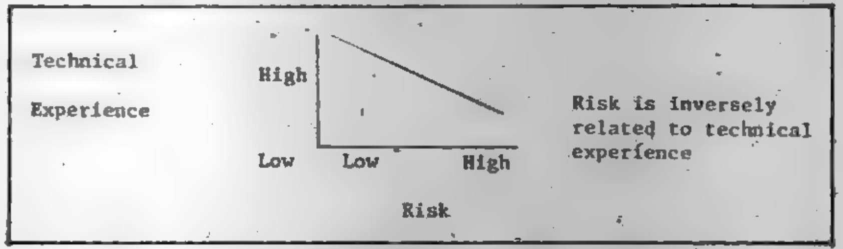


Figure 1



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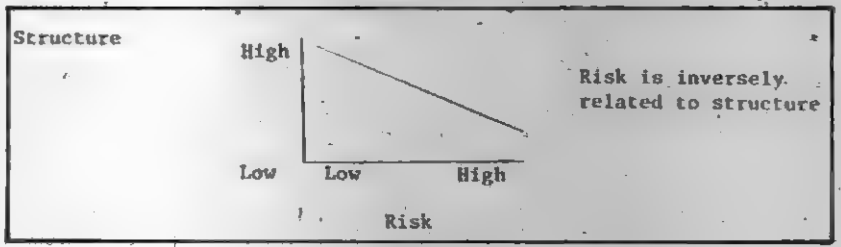


Figure 3

Inside

Integrated Approach Critical To Network Control SR/3
How Risky Is Your Net Development Project? SR/4
Fiber Optics — The Logical Choice for Users SR/5
Security Possible in Communications Networks ...SR/6
Smart Modems Offer Control of Functions SR/7
Confusion in Store for PBX Mart of the Future SR/9
Community Systems Merge Local Nets, Micros SR/11
Network Concentrators Monitor Performance SR/14
Choosing the Ultimate Value-Added Network SR/15
Hospital Finds Cure With Self-Developed Net SR/19
AT&T's T-1 Digital Line Service a Boon to Users SR/21
Overall Plan Needed for Corporatewide Nets SR/24
Monitoring Systems Aid Network Managers SR/25
Portable Terminals Scout Council's Cookies SR/27
Interface Units Extend System Capabilities.........SR/29
Trucking Firm Makes Tracks With Packet Net SR/32
Terminals at Helm In Race SR/33
Realty Firm Moves With Data Carrier System SR/35
Few Networks Aimed at Small Business User SR/36
Lumber Firm Ties CRT, POS Terminals to CPU SR/37
National Group Ties State Offices via DDP Net ...SR/39
Planning Yields Geisco Cost-Effective Network SR/41
IBM System/34 User Goes Remote for Less SR/42
Software Collects Kudos From Credit Company SR/45
Bank Counts on ATMs For Franchise Program SR/46
Fire Department Hot on Mobile Dispatch System SR/47
Firm Sticks With System to Trace Explosives ..SR/49
Chevron Routes Freight With Terminal Net SR/50

Integrated Approach Critical to Net Control

By Van Chu
Special to CW‡

In today's rapidly expanding communications industry, the battle for time and predictable network performance is no longer confined to users, technicians, engineers and technical managers: It is being fought by managers, corporate officials and directors. Many data communications manufacturers compete aggressively to offer a wide range of network products, but only a handful truly provide a full measure of defense against the constraints of time and performance.

Although network control, performance and management systems rank among the key weapons in waging this battle, no one system offers a total solution. Achieving this solution requires a delicate mix of network control and performance measurement, blended together to create an efficiently managed network.

The objective is admirable, but is getting there really half the fun? The ever-growing data communications marketplace, with its vast offerings of networking products, places the management information systems (MIS) manager in a mind-boggling predicament: Among the many considerations to ponder lies the question of whether to mix performance measurement with side-channel or main-channel network control.

Each combination offers merit on its own, but an integrated approach often provides the greatest measure of relief. Moreover, the right system will serve a multipurpose role in the corporate scheme: It not only achieves MIS goals, but also minimizes the financial and technical burdens associated with implementing systems.

MIS managers and executives know that a company's profits rely more heavily than ever on greater use and increased availability of the network — thus, their increasing concern over terminal response times and critical network parameters. They focus especially on the capabilities of users to transact business efficiently and on the ability of the technical staff to monitor operations and anticipate problems.

Accurate appraisals of user-perceived response times, coupled with meaningful reporting, facilitate long-term planning based on predictable network performance. Consequently, the need for effective network control and the ability to compile performance measurement information is becoming more important.

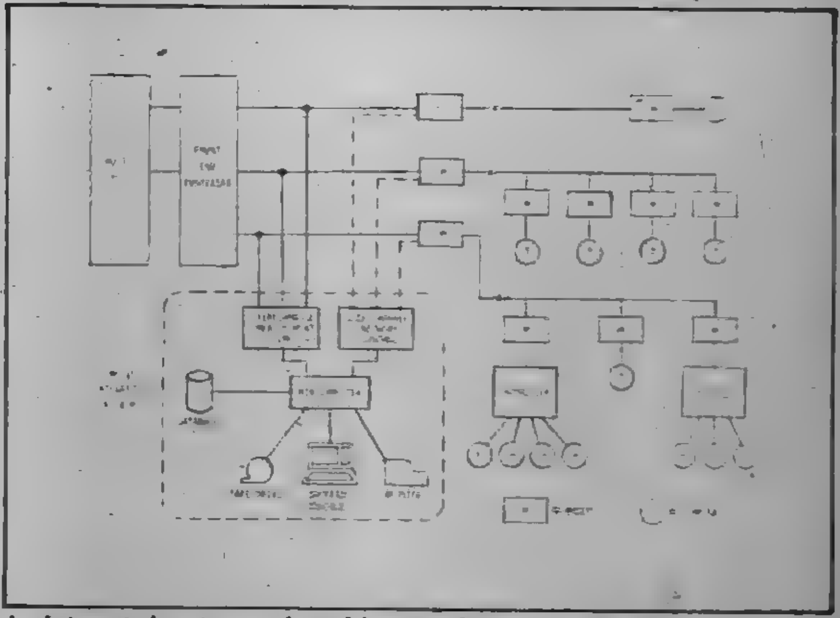
This need has been sensed within the data communications industry, prompting widespread response from network control and management vendors. A vast array of specialized equipment now exists, intended to manage vital network operating parameters.

This equipment can be classed as network control, performance measurement and network management. And since more and more vendors are developing network control and management and performance measurement system products, MIS managers face the initial challenge of distinguishing one class of equipment from another — and then choosing the proper mix. The distinctions of each should be understood at the outset.

Dealing With Downtime

Network control deals primarily with downtime, monitoring the everyday operation and administration of the network. It performs automatic testing and evaluates the condition of the hardware and the options associated with the network. Network control also provides fault bypass and restoral capabilities and maintains historical files based on accumulated data.

Performance measurement is relatively straightforward. It monitors the communications protocol on the main channel, which makes it possible to identify recurring characteristics associated with communications events. This forms the basic building blocks of the performance measurement function.



An integrated system such as this not only measures the performance of a network, it also allows the MIS staff to control and restore any network faults, including line or equipment failures. Since it has its own CPU architecture, it can also store all network fault and alarm events, information that can be used for future planning and upgrades.

With the addition of a data processor and a data base, these events — polls, terminal response times and similar repeated functions — can be stored along with the associated time intervals. Information can then be analyzed to determine the acceptable levels required for continued efficient operation, and specialized software can be called to display or print the data.

Network management compiles and reports network statistics to the operators and managers. The data accumulated by network control and/or performance measurement is based on network events or operator input. Network management is the data base management tool that correlates, formats and presents that data in the form of reports and screen displays. It compiles and displays graphics as well as printed output and maintains separate data files of all management activities.

The point of choosing a particular combination of systems is to merge the best qualities of each network product to form a single management tool. Some advantages and disadvantages of the basic network products should be examined.

In main-channel network control, used in IBM networks, control data is sent on the main channel along with the data. This approach has the advantage of main-channel visibility, but data throughput is affected because the control data information is embedded within the main data stream.

The control data often requires support from DP resources to make it available to MIS. Furthermore, main-channel network control is host-dependent. This means if the mainframe develops a problem or fails completely, network control is useless because the collection of network control information is locked in the mainframe data base until the CPU is repaired.

Advocates of side-channel network control systems point out that because side channel operates independently of the host, it is unaffected by hardware or software problems associated with the host. In fact, with side channel there is the added advantage of continued network monitoring during a host problem. Thus, diagnostic and control functions continue operating in the remainder of the network while the host is being repaired. The disadvantage of side channel is that it does not monitor the main-channel data.

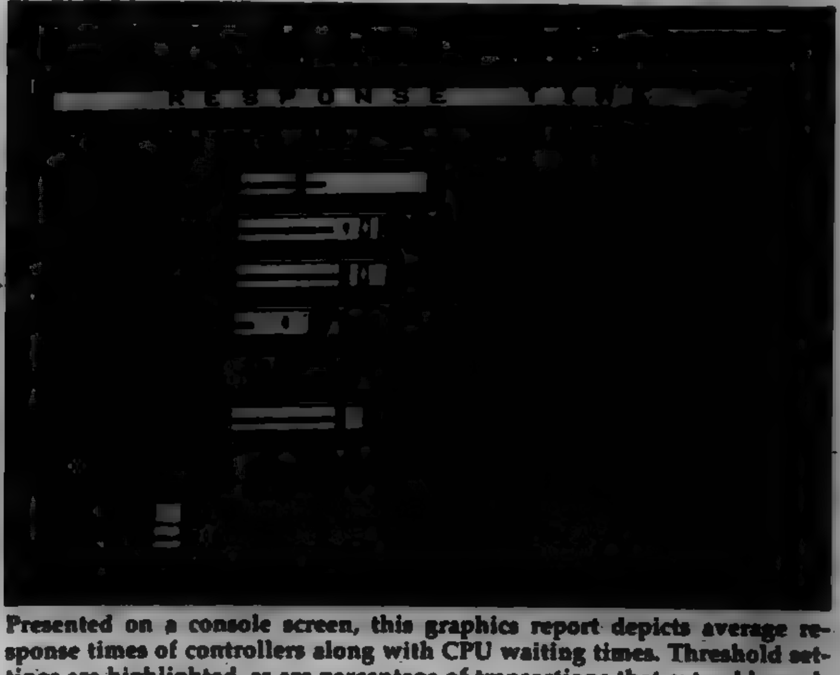
Although many companies now offer performance measurement equipment, many of them market stand-alone equipment. This can mean either a test box measurement device or a complete performance measurement system. Both are very accurate and can fill the gap for an MIS function.

Nevertheless, there are drawbacks. First, using performance measurement means contending with another vendor. Second, if it falls in the class of test box equipment, then several units will be needed to monitor multiline networks or, at best, a single box will have to be connected to each line one at a time. And, with text box units, there is no means of storing the data.

Even if the stand-alone is a complete system, with data base and data processing, another terminal is needed to support performance measurement systems, and the user usually must have different from what software his network currently uses.

Performance measurement equipment is often purchased OEM by data communications manufacturers, patched into the existing network control and measurement system and marketed as a total system. Although these systems link both network control and management to the performance measurement system, piecemeal design usually ends up costing more. Costs are higher in terms of duplicated equipment, additional software, specialized training and special terminals to access both the network control and performance

(Continued on SR/4)



Presented on a console screen, this graphics report depicts average response times of controllers along with CPU waiting times. Threshold settings are highlighted, as are percentage of transactions that extend boundaries during a selected period of time.

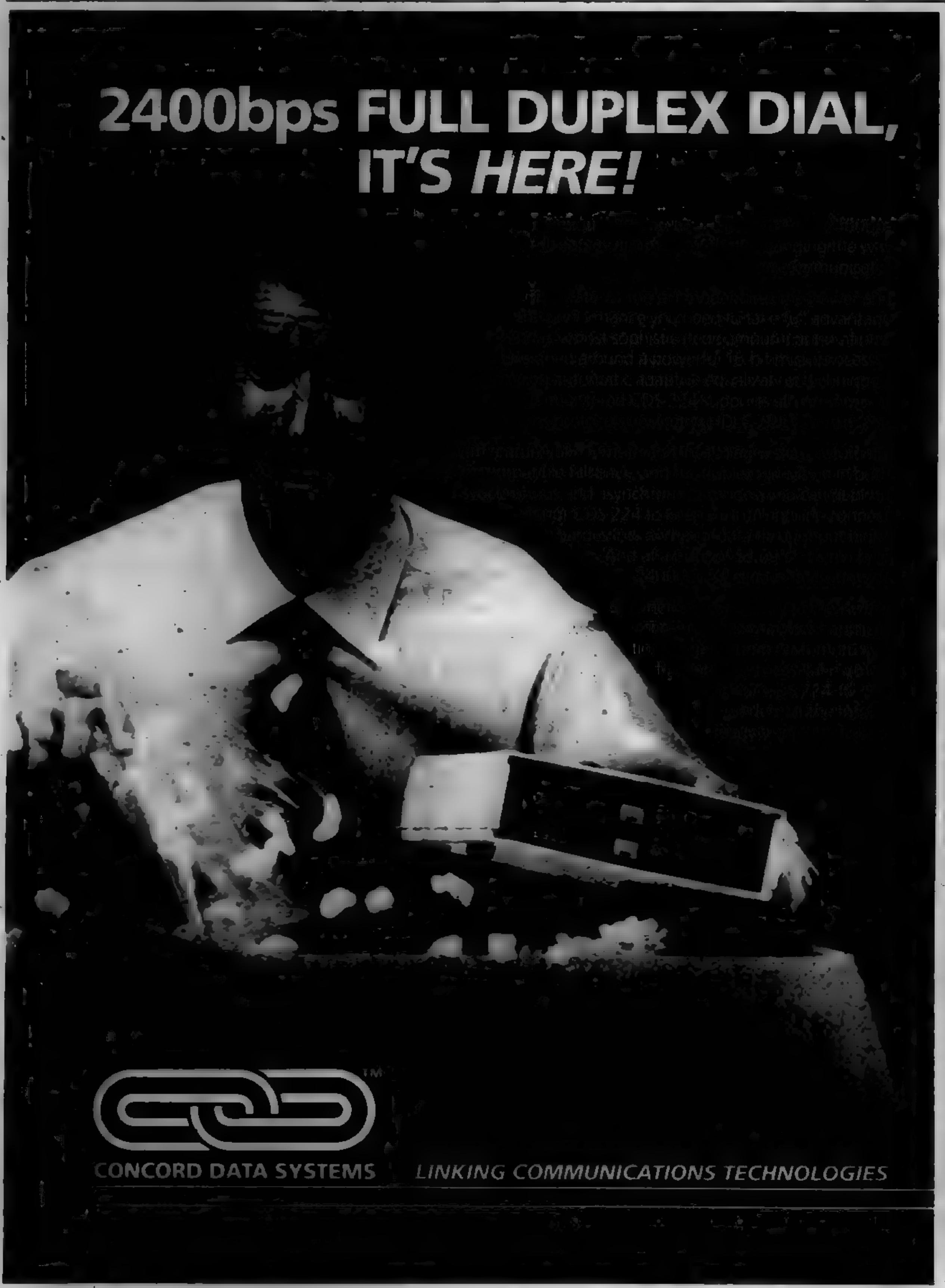
How Risky Is Your Net Development Project?

These questions were designed to be answered by the project manager prior to senior management's approval of the project and several times during the implementation. They are for self-evaluation.

Weights can be assigned numerically so that the higher the total number, the greater the risk of the project.

The questions were adapted from a communications development project, the Dallas Tire Case, No. 9-180-006 (Boston, Mass.: HBS Case Services, 1980).

	Risk	Weight
Size Risk Assessment		
1. Number of user departments involved with project?		
One	Low	1
Two or three	Medium	2
Over three	High	3
2. What is the estimated project implementation time?		
12 months or less	Low	1
12 to 24 months	Medium	2
24 months or more	High	3
3. Total development in person-hours for system?		
100 to 3,000	Low	1
3,000 to 15,000	Medium	2
15,000 to 30,000	Medium	3
More than 30,000	High	4
Technology Risk Assessment		
1. Hardware new to company?		
None		0
Front-end processor	High	3
CPU	High	3
Terminals	High	3
Sophisticated modems	High	3
PBX-CBX	High	3
2. Is system software (nonoperating) new to the project team?		
No	High	3
Data communications	High	3
Program language	High	3
Data base	High	3
Other-Specify	High	3
3. How knowledgeable is user in area of data communications?		
First exposure	High	3
Limited knowledge	Medium	2
High degree of capability	Low	1
4. How knowledgeable is user in proposed application area?		
Limited	High	3
Understands concepts but no experience	Medium	2
Has been involved in prior implementation efforts	Low	1
Structure Risk Assessment		
1. Has a joint data processing/communications/user team been established?		
No	High	3
Part-time representative	Low	1
Full-time representative		0
2. How committed is upper level management (user) to the system effort?		
Reluctant or unknown	High	3
Adequate	Medium	2
Enthusiastic	Low	1
3. What is the general attitude of the user?		
Anti-data-processing	High	3
Fair — some reluctance	Medium	2
Good — understands value of DP	[illegible]	[illegible]
4. Does user organization have to change structurally to meet system requirements?		
No		0
Minimal	Low	1
Somewhat	Medium	2
Major	High	3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Net Developers Must Chart Risk

(Continued from SR/2)

jects can be highly unstructured. One current trend is to design the integrated office by merging voice, data and other technologies. This cannot be done as one project. Project managers need to avoid the risk inherent in such complexity by segmentation strategies and staggered implementations.

Melone is a communications systems representative for American Bell, Inc., Parsippany, N.J. —

Integration Key To Net Control

(Continued from SR/3)

measurement system data bases.

MIS managers should definitely consider an integrated system. Integration provides all the benefits of network control and management with the added feature of performance measurement — and at lower cost and higher capability than piecemeal systems.

Integration maximizes the use of the system. Since both network control and performance measurement share a common data base, the systems can be accessed from a single terminal, where operators use common software instructions to handle all system functions.

Perhaps the ideal solution, then, is integrating a free-standing performance measurement system with side-channel network control and management. This approach has no direct link to the corporate DP resource, and because integrated systems share a common data base, they afford even more efficiency and can give the MIS group more effective control of its resources.

Integrated in this way, systems have the pluses of both main-channel monitoring and side-channel control without the disadvantages.

Van Chu is director of network control products at Intertel, Inc. in Andover, Mass.

Fiber Optics — The Logical Choice for Users

By Richard J. Pybus
Special to CW‡

If a poll had been conducted in any company 10 years ago about the number of data terminals it would be using in 1983, the result probably would have been a number about one-eighth of the actual total.

The result of this poor planning is often a network consisting of almost every type of local data communications device on the market, communicating over a virtual tangle of data cables and borrowed intercom pairs. This approach has worked fine for many up to this time, but what does a company do for the next 10 years of growth now that all of its conduits are full and the building supervisor flatly refuses to let the firm hang cables out the window?

Data communications can be divided into three neat categories: remote DP, which uses telecommunications or other facilities; local point-to-point data transfer; and the local-area network. In many cases, the bulk of the ongoing data transfer is between terminals and a processor.

Fiber-optic systems have not yet evolved to the point where they should be considered for long-distance networks. Lease-based systems fare a bit better, as evidenced by AT&T's choice of this technology for its Northeast Corridor project.

It is unlikely that this type of system will ever be practical for the end user, except in areas where AT&T will be providing Dataphone Digital Service over fiber. At this time, it still makes more sense to use the services of the telecommunications and satellite companies for long-distance data transmission.

The distances involved in local data communications systems are such that fiber-optic systems operate perfectly without repeaters. Most systems that have been installed, even where there is more than one building involved, are less than one kilometer from end to end. Systems of this size often contain short-haul modems with twisted pairs between them, dial-up circuits, statistical multiplexers and even low-capacitance data cables providing the links between the terminal devices and the processing hardware.

Many installations use all these products with varying levels of success. Fiber optics may be used to replace effectively all of these and, as a bonus, provide some impressive advantages over the systems currently in use.

Industry Niche

This niche of the industry has grown quite rapidly in the past couple of years, partly because some of the old problems associated with the handling of the fiber cable have been eliminated. Fiber cable manufacturers have developed their craft to the point where a user may buy a cable for any application — duct, aerial, air plenum, direct burial and even rodentproof.

In conjunction with the development of the cable, manufacturers of connectors and field-splicing devices have made impressive advances, to the point where some customers are installing their own.

Fiber systems provide more bandwidth than most installations can use. Standard fibers are rated at about 200 MHz/km, with premium-quality fibers available up to 1 GHz.

Assuming that a typical link might be two kilometers long (and remembering that the usable bandwidth of a fiber decreases as a function of length), it is possible to use 100 MHz of bandwidth, which is equal to about 250 data devices operating simultaneously at 9,600 bit/sec. Only microwave links or some coaxial-cable-based systems can approach that capacity.

Many data communications managers are looking at fiber-optic systems because they are running out of cable space in their facilities. Faced with the dilemma of having to provide as much bandwidth as possible in as little space as possible, they may opt for fiber.

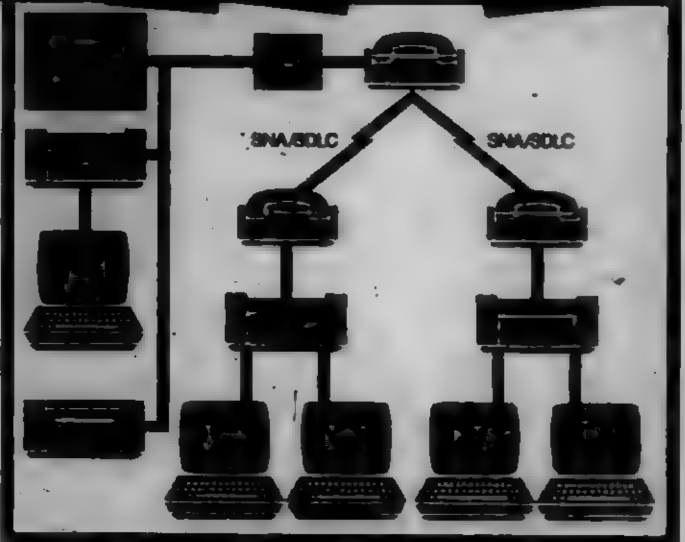
A kilometer of two-fiber cable weighs about 30 lb; an equal length of data cable could weigh over 200 lb. The fiber cable may be added to cable trays without toppling them or in high-rise building shafts where the cable cannot be strain-relieved along its length.

The fact that the core of the fiber is glass causes many people to be unduly concerned about the strength of a fiber cable. A glass fiber, even without its protective cable housing, may be bent into a circle equal to about three times its diameter without damage. Once the fiber is enclosed in a cable, tensile strengths of three or four times those of similar copper cables are possible.

It is virtually impossible to tap a fiber cable without detection. One of the nice properties of optic transmission is that when light is extracted from a point along the length of a ca-

(Continued on SR/6)

SNA:



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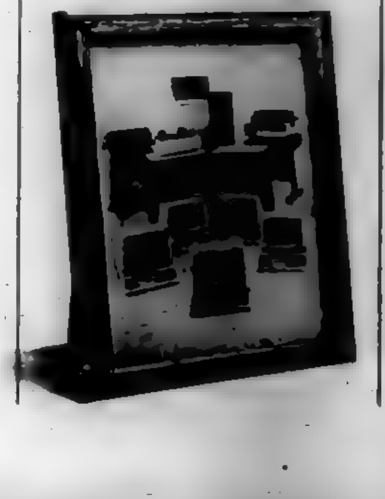

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Steps Outlined

Security Possible in Communications Networks

By Stephen E. Levin
Special to GW‡

As communications networks become more widely distributed, security-related problems are magnified. The primary concern is protecting both resources and data. Access to resources must be controlled to ensure that resources are available for authorized processing. Data must be protected from accidental or intentional misuse.

In distributed systems, access control by the security officer is difficult. The security officer can not have control of system access points, nor can he physically control remote users, who are identifiable only by the way they represent themselves to the system being protected. As a result, remote users can repeatedly attack the system, and if they can write even the simplest program, they can repeat the attack hundreds of times per second.

Protecting data is also difficult within communications networks. Data can not be physically protected when it is being transmitted over long distances. This is true regardless of the physical transmission medium used (microwave, satellite or telephone lines) or the communications protocol set being used (X.25, High-Level Data Link Control, Systems Network Architecture or Transmission Control Protocol/Internet Protocol).

Access Control

The solution to access control involves mechanisms to achieve control and assurance that the mechanisms are effective: Access must be limited to authorized users for authorized uses.

Several mechanisms can be used to limit access to authorized users. Traditionally, the user is identified by something known (password), something owned (identification badges) or a personal characteristic (voice or signature). These methods have limitations and are not always practical in a distributed system.

Passwords are likely to be guessed, circumvented or discovered. Badges, guards and personal recognition may not be possible at remote sites. Moreover, access decisions must be based only on the electronic identification that the remote user presents to local-access control mechanisms, and these are logically no more reliable than the simple passwords.

However, password protection can be maximized. The traditional password protection can be used, but the passwords must be checked and their use must not be circumvented. The logon procedure should not be interruptible. Passwords should not be echoed onto screens, and users must not be allowed to select trivial passwords.

Additional protection can be added to traditional password methods to guarantee that the user is authorized. For example, the system must demonstrate that it will resist giving up passwords. Passwords in transit should be protected with encryption. Also, the user must not be deceived into believing he is giving his password to the system when he actually is giving it to a user/program pretending to be the system. Further protection can be added by procedural and administrative actions.

Use of the system must be monitored with an audit trail to detect unauthorized operations by authorized users. The audit trail should be automatically generated and spoof-proof: Users should not be able to force ar-

(Continued on SR/8)

Fiber Optics: Logical Choice

(Continued from SR/5)

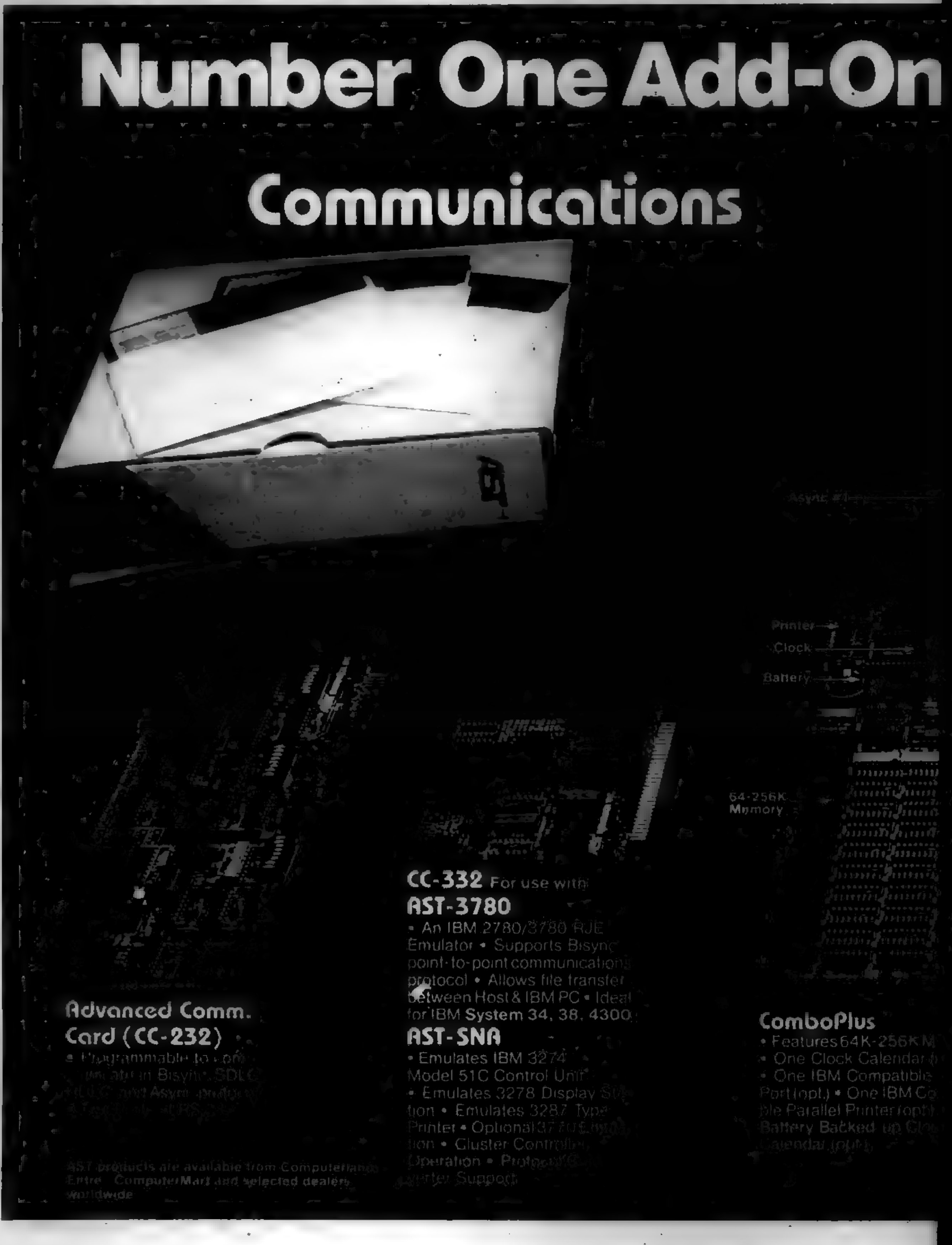
ble, the amount of energy arriving at the end is reduced by a proportional amount. It is easy to detect these losses and to terminate automatically communications if a breach occurs.

Fiber-optic systems typically have a bit error rate 10,000 times better than comparable copper systems. Because fiber-optic systems do not use metallic conductors or electricity, the fiber is completely immune to all of the mishaps listed above.

Multimode fiber will accept many different wavelengths of light. At present, most of the systems available use 830 nm wavelength light, but it is possible to use wavelengths from 1,100 nm to 1,700 nm as well.

In the next few years, a lot of equipment will use fiber.

Pybus is the regional sales manager for Phalo Corp./Optical Systems Division in Chatsworth, Calif.



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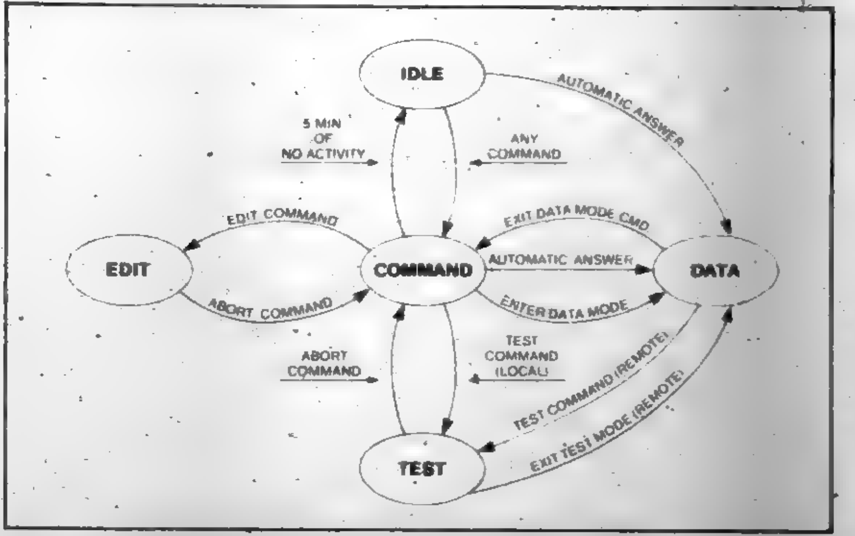

Command and Control Flow of a Smart Modem

Smart Modems Offer Control of Functions

By Jud Gilbert
Special to CW‡

Smart modems are the latest step in the evolution of data communications equipment. These devices, which allow business computer and home computer users to view and control all available features from a terminal, feature simplified and partially automated operation that saves operator time and reduces line costs.

Three factors create the demand for this new generation of modems:

- Explosive growth of multilocation data system users.
- Greater use of public-switched telephone networks rather than private or leased lines for data transmission.
- Market demand for equipment that eliminates the need for special operator training or skills.

The newest designs are menu-driven, terminal-controlled modems that are virtually transparent to the operator. Because they incorporate microprocessor and memory technology advances, these modems offer expanded features over conventional modems. In fact, they are so convenient and efficient that replacing equipment of an earlier design, even if it is still functionally adequate, can easily be cost-justified.

The market share of direct-connect, 1,200 bit/sec, full-duplex, asynchronous, Bell Laboratories 212-compatible modems has grown exponentially during the past few years. Sales, in both units and dollars, are expected to grow at an average annual rate exceeding 300% for the next several years. With a growth rate far higher than any other type of modem, it is understandable that smart, 212-compatible modems are the first to be marketed by modem manufacturers.

Besides menu control of options and operations, smart modems give the user terminal control of all available features. Typically, these include a Help menu with all the basic command information required to operate the system; an option menu that allows the operator to control such functions as voice/data mode, answer-on-ring-number and parity; a test menu; and a directory of phone numbers. Because they are terminal-controlled, desired functions are usually effected by a simple keystroke.

Terminal-controlled modems are essentially user transparent. They incorporate some automated functions, such as autodial, auto-answer and test features, and allow functions that require operator interaction to be controlled from the terminal keyboard. With menu-provided instructions, any user familiar with the terminal keyboard can have complete control of the data communications operation without special knowledge or experience. These modems interact with the terminal through the standard modem/terminal interface connector and use standard Ascii codes and user-recognizable, English-like commands. Cursor addressing of menu options is also provided to support terminals with a cursor feature.

With the expanded memory capacity in today's terminal-controlled modems, many telephone numbers, complex calling sequences — or both — can be stored in the call directory. This allows the modem to attempt a call setup via the lowest cost route. If, after a prescribed number of attempts, the call has not been completed, the modem can sequence to

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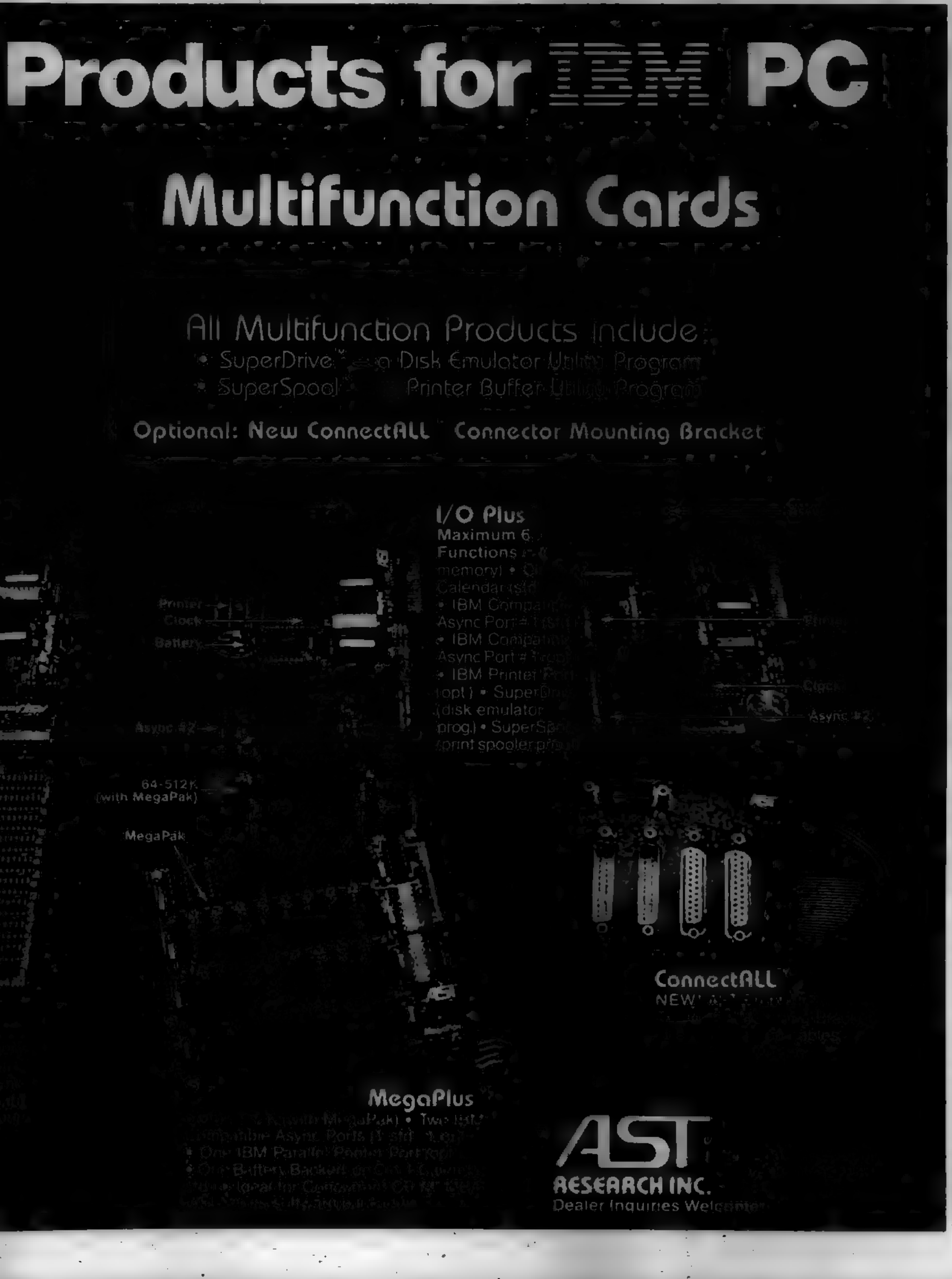

Communications Networks Security Outlined

(Continued from SR/6)

bitrary entries on the audit trail. It should reflect all security-related events, such as logon attempts and connection attempts. Users must be aware that the audit trail is regularly reviewed. The threat of detection often deters unauthorized use.

An example method for monitoring use is a secure communications processor, developed by Digital Technology, Inc., based on the HUB Executive. The HUB Executive is a verified secure operating system designed to support communications applications. The system connects a large host to a packet switching network and offloads communications functions from the host. It allows terminals on the communications processor to access the packet switching network. Access to the host and the packet switching network is controlled and monitored.

Access control by the communications processor is enforced by many methods, including the use of passwords, a secure attention character and mediation of all I/O processing. Passwords are set by the system security officer rather than by users. If the password is exposed by a legitimate user trying to access resources over a communications path not adequate for the user, the access fails and the password is made invalid. Only trusted software can read passwords.

The secure attention character forces the system to attach the user to trusted software, ensuring that the user is always connected to the system rather than to a malicious user/program. The HUB mediates all I/O processing and checks all interprocess communications for correctness.

When the necessary access control mechanisms are implemented, there must be assurance that they are all-pervasive and complete. All attempts to gain access to the sensitive system resources must be checked.

A significant amount of independent testing by system designers/implementers and a penetration attack by someone other than the system designers/implementers are recommended. Formal methods for verifying security can also be implemented. Formal mathematical statements describing the system can be formulated, and rigorous proofs that the system meets a set of previously determined security criteria can then be performed.

While access control is assured both by testing and formal methods, only the latter can show that the system and all trusted software meet the security requirements. System Development Corp., using its Formal Design Methodology and INA-JO specification language, and Digital Technology, Inc., using its specification and verification system, have verified that HUB Executive software meets the specified security requirements.

Data Protection

Communications security over networks is made difficult because data is out of sight and out of the user's control. Whether the communication is over leased lines, ordinary telephone lines or on a common carrier, the user is subject to threats that others may read the data or may intentionally modify, insert or delete data.

Protecting the communications paths may be impossible or impractical. However, it is possible to protect the data while it is on the paths, and that is the best solution. This protection is accomplished by encryption.

Encryption is a method of concealing the meaning of data. Many methods (algo-

(Continued on SR/10)

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Users to Bear Costs of Turmoil

Confusion in Store for PBX Mart of the Future

By Thomas B. Cross
Special to CW‡

Just a few years ago, state-of-the-art switching technology was all mechanical. In fact, most of the telephone company private branch exchange (PBX) or central office switching equipment is still mechanical. At the rate these telephone operating companies are moving, it will be long into the 21st century before most, but not all, of this equipment becomes computerized.

The telephone companies are pushing hard to reduce maintenance costs, improve productivity and look toward new service offerings that new computerized switching systems offer. Users are seeking new features and integration with data processing services. This has forced the emergence of high-speed, high-capacity services provided by a local-area network.

There has been much talk about the emerging local-area network industry. Cable TV operators have provided video entertainment services for over 30 years via local-area networks, but have no experience in making connections or switching. Telephone companies come from switching and have no experience in wideband entertainment services. Each seems to be rushing toward this middle area called local-area networks. What, then, is a local-area network?

A local-area network is a pipe composed of twisted pairs, coaxial cable, optical fiber or some combination of each. The pipe can make connections for telephone service, hook computers together with other computers, switch data or voice, link meeting rooms together for teleconferencing and so on.

The issue facing this industry is not merely technological or economic, but also political. Simply put, certain protocols or "rules of road" need to be established so that the bits of information can read the road signs.

Currently, there are over 20 different kinds of road signs, such as broadband, baseband and data cable vs. telephone wire pairs. This creates chaos when trying to connect one device to another. The players represent the most formidable companies in American industry. Each company wants its rules as the chosen champion. The winner in this game will reap billions of dollars in revenue. The fury will rage on for many years.

What does this mean for the PBX of the future? First, it means confusion, the users will also bear the costs of this turmoil. Each company will tell you that its local-area network or PBX is the only choice. The users are asking, "Do I spend a lot of money now for something I can't really use or wait until later, and if I wait, will it work with what I've got now?"

Second, there is the issue of increasingly difficult choices in creating networks. With Federal Communications Commission deregulation, there are now over 50 different long-distance companies.

In the near term, the user will probably have at least two, probably three, different companies that will connect PBX processing to long-distance telephone calls. With American Bell, Inc. coming on-line, the new kid on the block will have a set of options for the consumer,

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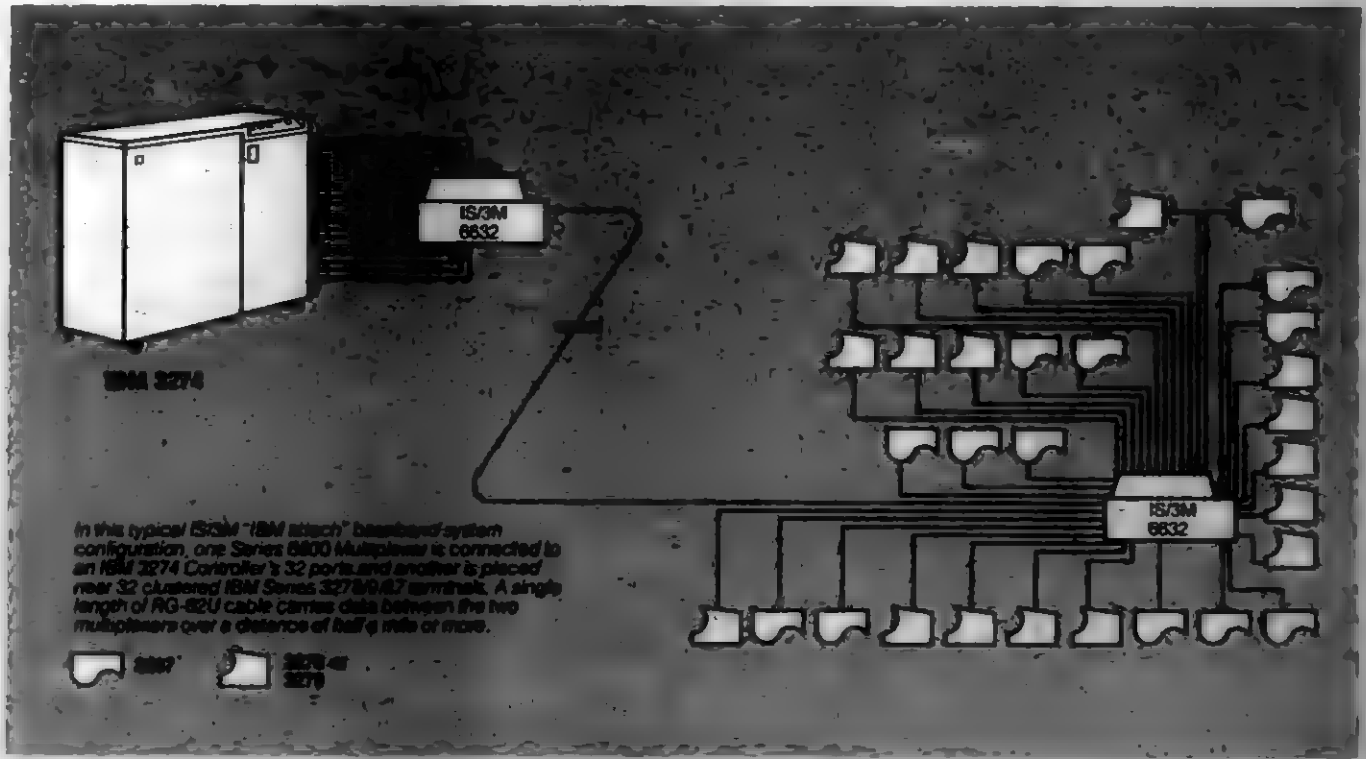

In this typical IS/3M "IBM attach" baseband system configuration, one Series 6600 Multiplexer is connected to an IBM 3274 Controller's 32 ports and another is placed near 32 clustered IBM Series 3278/9/87 terminals. A single length of RG-62U cable carries data between the two multiplexers over a distance of half a mile or more.

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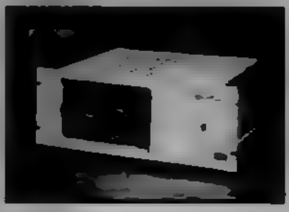
Connect as many as 32 terminals to a distant IBM 3274 Controller with a single existing baseband cable.

Until recently, there was just one way to connect more than one IBM 327X terminal or printer to a 3274 Controller: Install another dedicated cable for each new peripheral.

Now there's another, simpler, and very reliable way to do the same job without pulling long lengths of new cable. It's called the Interactive Systems/3M Series 6600 "IBM® attach" baseband system. And it lets you hook as many as 31 extra terminals or printers onto any existing RG-62/U cable that now connects your IBM 3274 Controller to a terminal.

The method: time-division multiplexing.

IS/3M's new Series 6600 "IBM attach" uses time-division multiplexing (TDM) to squeeze more data channels onto a standard baseband cable. Installation is quite simple. One or more IS/3M Series 6600 head-end multiplexers is attached to the controller. Depending on the model selected, a single MUX can handle data for up to 4, 8, or 32 ports.



Series 6600 Multiplexer, available with 4, 8, or 32 input/output ports.

The multiplexed data streams are carried via the existing RG-62/U cable to an identical Series 6600 MUX at the remote location. Local baseband cables connect this multiplexer to its assigned terminals and printers.

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Any combination of IS/3M multiplexers can be used with the IBM 3274 Controller, so long as the total number of channels doesn't exceed 32. For example, three 8-channel MUXes could be used with existing cables to feed up to eight terminals and/or printers at each of three different sites.

The baseband system is fully transparent and plug-compatible to IBM equipment. Just as important, it allows all peripherals to send and receive data at the standard IBM channel speed of 2.3 Mb/s.

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PBX Mart of the Future Marked by Confusion

(Continued from Page SR/9)

including data services.

Third, rapidly changing technology must also be considered. Packet-switched voice communications is on the horizon. This technology is at present being used exclusively for data, but cross-country testing has proven the viability of its application for voice.

Some PBX systems are now going digital from the handset. Even though most manufacturers tell you that they have a digital PBX system, it is actually digital only down in the PBX room inside the machine.

A leading management research firm recently suggested that users should "experiment" with digital PBX systems. With the average cost per PBX line hovering at $1,000, upper management is finding it difficult to justify expensive experiments. Even the smaller PBX systems cost $600/line. What you can afford to do is to be careful.

Cross is managing director of Cross Information Co. of Boulder, Colo.

Future Options for PBX Consumers

In the future, there will be a wide range of options available to the corporate PBX consumer. These options include:

- Call forwarding, conference calling and call transfer.
- Voice store/forward involves a centralized telephone answering system, but with sophisticated features.
- Voice dictation — can be integrated with voice store/forward.

A list of network features includes:

- Least-cost and optimized network and off/network routing of calls.
- Tandem network features for multinode environments.
- Tasi/Vocoder — voice concentration.
- Encryption — for security protection.
- Technical control.

A list of data features includes:

- Modem pool — sharing modems to reduce costs.
- Speed conversions — upward and downward.
- Language conversions — various word processor manufacturers.
- Packet interface — X.25 to carriers.

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Menu, Terminal Control Featured in Smart Modems

(Continued from SR/7)

the next less expensive route and then, if required, to a direct dial.

Telephone numbers can be stored in the smart modem's memory. If the unit has a nonvolatile memory, such as in Prentice Corp.'s recently introduced Model 212TCM, numbers are retained even when power is removed. This is an extremely important feature because the portability and ease of setup of smart modems will undoubtedly result in their being moved frequently from one location to another. The only requirement for operating a smart terminal-controlled modem on a public-switched network is a terminal and an available telephone jack.

Autodial and auto-answer features have been available on advanced 212-compatible modems for some time. Placing control of these modems at the terminal, however, enables the terminal user to select from the displayed directory any of the telephone numbers in memory by name or code.

Because the terminal can control all modem functions necessary to transmit or receive data, a handset is not required unless voice communication is also desired from that same location. In that case, the modem's autodial function can also set up voice calls. An integral speaker, activated during call setup, permits the user to hear the ring and answer when placing a voice call. When the call is answered, a single keystroke connects the telephone handset to the line. When answering a voice call, the user need only lift the receiver before the modem auto-answers the call.

With the many user-friendly features of 212-compatible terminal-controlled modems, home computer and business computer users can have sophisticated data communications equipment that previously was considered practical only for individuals and firms with extensive technical experience and high-volume data transmission requirements.

Gilbert is vice-president of business development for Prentice Corp., Sunnyvale, Calif.

Data Protection Possible in Nets

(Continued from SR/8)

rithms) can be used to encrypt data. Public key cryptosystems are based on mathematical operations thought to be impossible to undo.

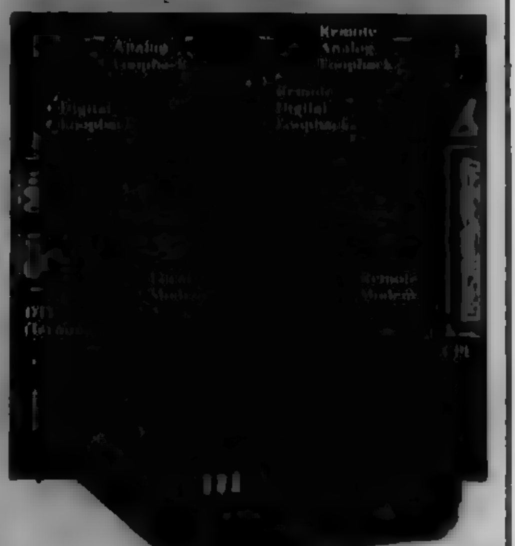
The two major types of encryption are link encryption, which protects the meaning of data while on a single point-to-point path, and end-to-end encryption, which protects data while over all the links in a communications network.,

Link encryption is more commonly used. It provides data privacy so that browsing is prevented, but it can not protect against the more sophisticated threats of modification, insertion or deletion of data. Standard methods for providing link encryption have been developed.

End-to-end encryption corresponds to Layer 4 (the transport layer) in the International Standards Organization open systems interconnect architecture. Because Layer 4 is end-to-end, it can provide protection through encryption to any number of communications links or intermediate networks.

Levin is director of the Government Systems Group at Digital Technology, Inc., Champaign, Ill.

LAM-XD



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Community Systems Merge Local Nets, Micros

By Harry J. Saal
Special to CW‡

These are times of great change. Futurists say the information explosion is upon us.

In corporate environments, computers are no longer kept for the exclusive use of computer professionals. From senior management to workers on the assembly line, employees are rapidly coming to see computers as a standard part of the office environment.

In business, a wide spectrum of individuals must share information. Rarely is truly personal data encountered in corporate situations. One person might enter the basic data, another will edit or modify it and a third will produce reports or graphic displays from it. Information is typically supplied by many sources, but must be merged, managed and distributed to be useful. Also, because information is a valuable resource, it must be protected from malicious or accidental misuse.

Although often separated by distance, allied users must work together. On different floors, in different buildings or in different states and countries, fellow workers must exchange information. For them, communications is no longer a luxury: It is essential and growing daily in importance.

Recent Developments

Two recent developments, local-area networking and personal computing, provide a way to address the needs of this new class of computer users. Community microcomputing is the merger of these two technologies. Many local-area network vendors are looking to community microcomputing as the answer to the computing needs of the '80s.

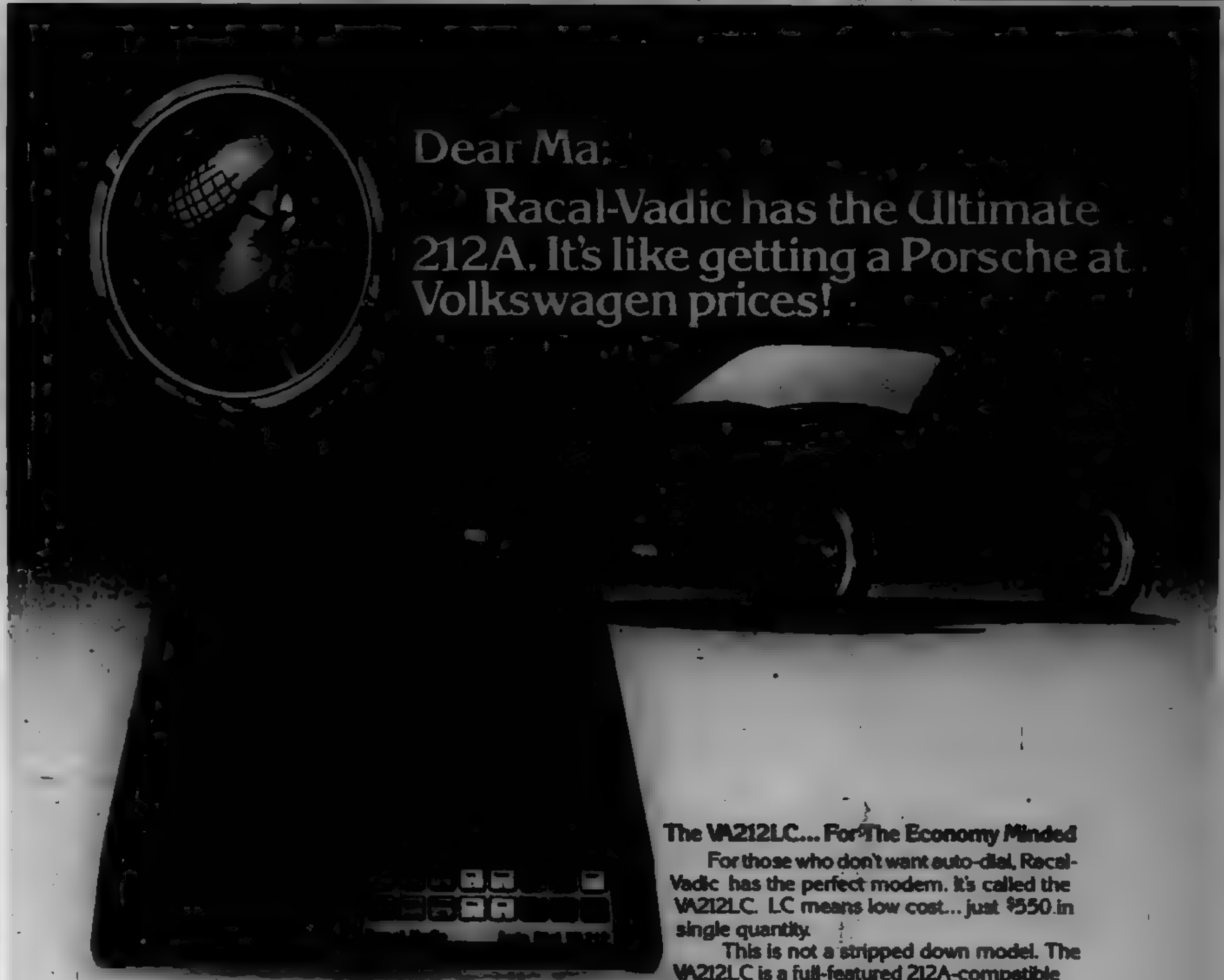
Community microcomputing allows a community of users to share information that resides on common peripherals. Users share common programs and data, as well as expensive, high-quality equipment such as printers and disks. An individual connected to a community microcomputing system has his own dedicated personal computer, as well as a support environment for communications and for sharing peripherals and information. Mainstream personal computers, serving as desktop workstations, provide a familiar, nonthreatening setting that enhances the effectiveness of professional and clerical workers.

Such community microcomputing personal workstations must be open-ended multifunction tools that allow word processing, data manipulation, graphics and electronic messaging. Because business tasks can be quite specialized, all individuals in the community will not use the same type of workstation. A choice of workstations, with a strong emphasis on compatibility and data exchange capability, must be available to a company for its workers.

Community microcomputing systems must be modular, adding users, functions and new applications without major dislocations to the system as it grows. Modularity preserves the initial system investment as company needs grow and change. Accommodating simple incremental growth ensures a long and stable future for community microcomputing systems. And through the use of a vendor-independent personal local-area network, users can integrate newer, more cost-effective or higher performance workstations into their networks as time goes on.

For a wide range of applications, community micro-

(Continued on SR/14)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No single universal standard has emerged. Nor is one likely to. There are simply too many diverse networking environments, each fulfilling specific, mutually exclusive needs.

That's why Digital is committed to supporting and, in fact, actively promoting the more important standards now surfacing in the various environments.

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When we first developed our networking architecture, we understood the need for flexibility. We consciously adopted an architectural strategy that would allow our networking software to work freely with a wide range of protocols, including some that didn't even exist at the time.

The success of that strategy is now becoming apparent. As more vendors enter the networking field, Digital is uniquely positioned to offer compatibility with the emerging protocols. We've gone farther than anyone to assure that your options are open.

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Digital offers the X.25 protocol for use with public packet-switched networks such as Datapac (Canada), Transpac (France), and PSS (U.K.).

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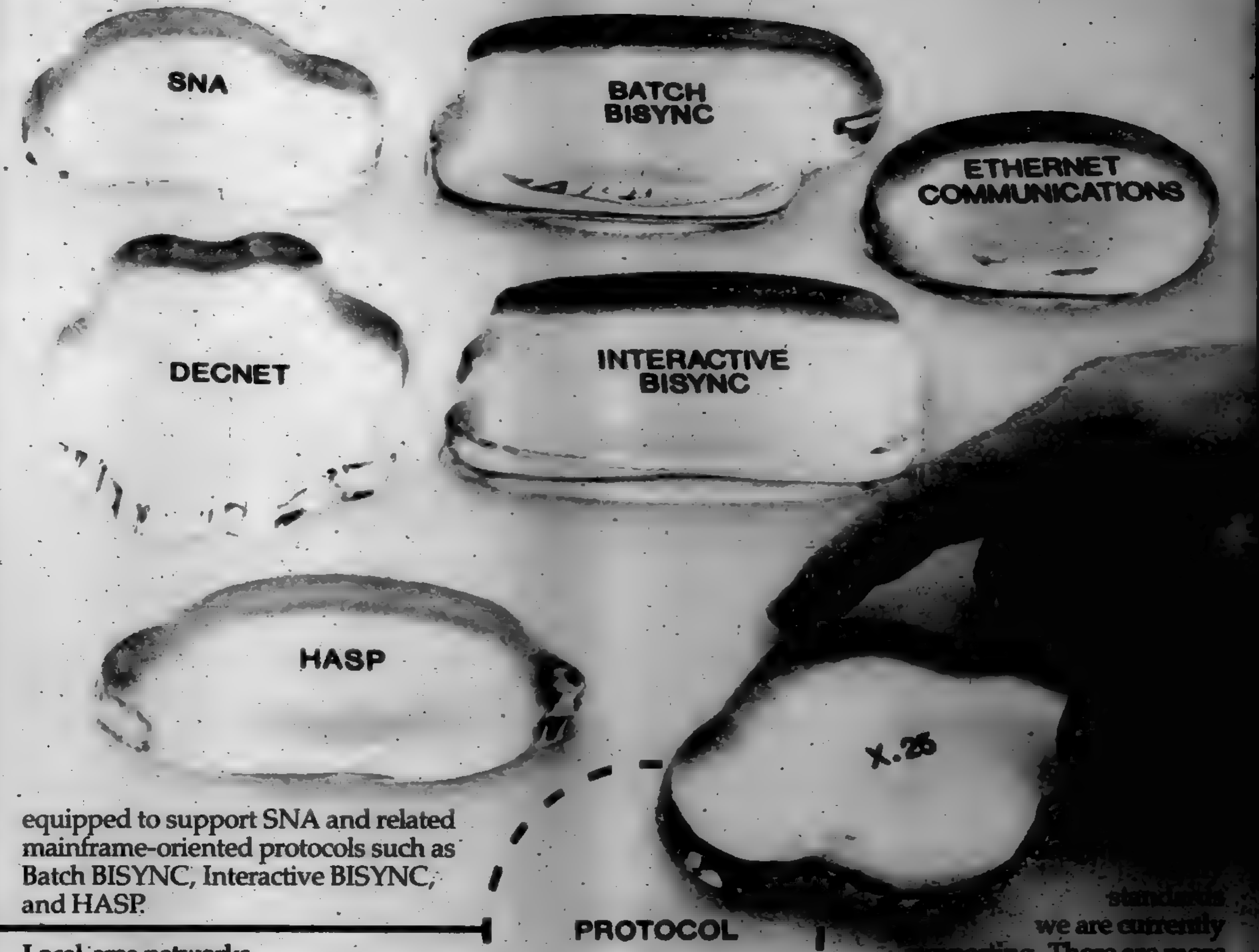
Even though we prefer to implement more flexible distributed networks, we are amply



equipped to support SNA and related mainframe-oriented protocols such as Batch BISYNC, Interactive BISYNC, and HASP.

Local-area networks.

Digital is one of the original sponsors of the Ethernet™* specification that has been adopted by a number of computer, semiconductor, and office equipment manufacturers. We recognized early on the need for highly reliable local-area networks. We were in on the ground floor of the definition, development and, now, the implementation of the Ethernet specification.

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DECnet,™ Digital's proprietary networking software, is based on a layered architecture. This is the same architectural approach followed in the model proposed by ISO. Our DECnet offers a wide range of quality networking products, products that allow such sophisticated options as adaptive path routing, down-line loading, and enhanced network management capabilities.

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We have listed a few of the standards we are currently supporting. There are more. But even more important than the number of protocols is the attitude we have toward them. We are determined to help you meet any kind of networking objective. And our capabilities in that regard are as far-reaching as they are farsighted.

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We change the way the world thinks.

Network Concentrators Monitor Performance

By Budd Barnes
Special to CW‡

The large-scale DP user now takes the computer mostly for granted. The big concern today is getting these computers interconnected within a network cost-effectively and reliably.

There is too much at stake now to risk the failure of a nationwide or international network, no matter who the users are.

The answer to the "cost-effective" part of the requirement came about in the form of the multiplexer, which enabled users to eliminate numerous high-cost, one-on-one hookups between network elements and to substitute fewer, high-capacity, low-cost channels instead.

As with all benefits, however, there is a price to pay.

A network now consists of interconnected groups of co-located computers and terminals, all of which have their traffic routed via their cluster multiplexer, which in turn addresses the high-capacity channel. Now, a line failure in the absence of one-on-one connections isolates an entire cluster and can, in effect, knock a whole city or office complex out of the network.

This condition presented sufficient risk with time-division multiplexers. The risk was increased for users when supercapacity statistical multiplexers allowed even greater network concentration with fewer main trunks.

The problem that arises with sta-

(Continued on SR/18)

Community Systems Merge Local-Area Networks, Micros

(Continued from SR/11)

computing solutions are far more economical than conventional multiuser minicomputer approaches. Community networks are less expensive to purchase, and due to lower overhead, they are also less expensive to operate. Fitting easily within existing office environments, community networks are less expensive to install than dedicated computer facilities.

More than price alone separates the personal local-area network solution from traditional computing systems. To achieve productivity gains, workers must accept a system, rather than resist it. Using familiar personal computers as workstations significantly aids that acceptance.

Because the personal network functions transparently, the user sees the network as an extension of his own personal environment, rather than feeling like a mere "node" in a complex distributed data processing system. The user feels he is controlling his environment, not being controlled by it. This feeling of control and individuality by the user is the single most important difference between traditional systems and community microcomputing systems.

Technology itself, then, is not the focus of community microcomputing systems. Communications networks are used in a simple and transparent fashion. Local and remote peripherals are accessed in identical fashion. Users need not be trained programmers in order to use the system actively and creatively.

Communications

A community microcomputing system must allow all users to communicate with each other, directly or through shared information. Communications between geographically remote personal networks support the extended community. Communication gateways allow data to flow to and from major mainframe installations. In this way, community microcomputing expands the available computing alternatives, cooperating and co-existing with both traditional mainframe environments and individual (non-networked) personal computers.

Open communications are the hallmark of community microcomputing. Access to sensitive information is controlled through the use of passwords and encryption, while users communicate freely otherwise. Shared programs are available on a large-scale basis, while sophisticated access controls that meet the security requirements of the community must be provided.

Community microcomputing is a true systems-level solution. Dedicated to the requirements of its users, the personal local-area network readily adapts to a rapidly changing world.

Saal is president of Nestar Systems, Inc., Palo Alto, Calif.

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A Two-Stage Project

Choosing the Ultimate Value-Added Network

By Ron Young
Special to CW‡

Data communications has become, like medicine and law, a field crowded with specialists. In the past, the general practitioner and the family lawyer could meet the needs of most patients and clients. Similarly, AT&T has been the general practitioner in the data communications field. Until recently, the prospective data network user has had only two options: set up his network, utilizing phone company circuits, or go with a handful of networks, taking what they have to offer.

Today, there are many value-added networks on the market. They do more than just allow access to leased-line or satellite transponder time. They "add value" by providing the client with equipment such as modems or by providing such services as designing and installing the network, monitoring transmissions for breakdowns or errors and maintaining the lines.

Some networks only assume service responsibility for a portion of the transmission path. Others, such as RCA Corp.'s Cylix, do systems diagnostics, protocol conversion, maintenance and error detection over the entire path, from the entry at the remote client terminal to reception at the host.

Because of the diversity of services now available, getting custom-tailored communications service no longer requires that companies design and set up their own networks. For many medium-size companies in which satellite communications would be ideal, this could be prohibitively expensive. Without the alternative of value-added networks, the very service ideally suited to their unique communications needs would be out of reach.

Realizing such specialized service is a two-stage project. First, the user must select the network that provides the most appropriate method of communication. Second, the user must work closely with service-oriented and technically expert network personnel who will take the time to understand and adapt their system to the user company's needs.

Narrowing the Field

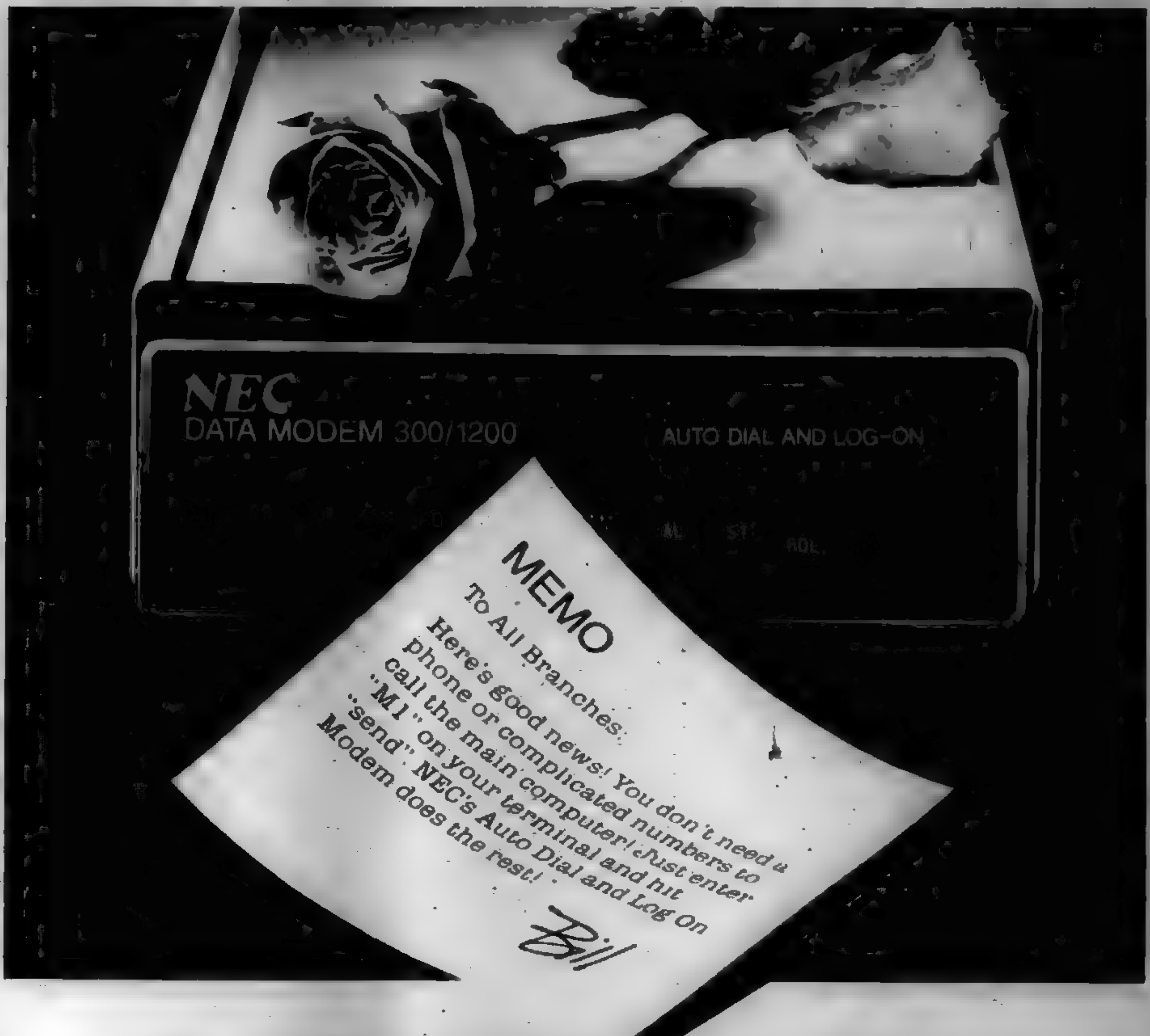
The process of selecting the best network for a particular situation begins with some simple decisions, leading to much more complex ones based on a clear knowledge of the kind of information to be transmitted and the capabilities of the equipment to be interconnected.

The most fundamental question the data processing manager should ask is: Does his company need voice-, video- or data-only communications or a combination of all these? For example, if only data communication is required, it is foolish to subscribe to and pay for voice-and-data network service.

Equally basic is whether one or more remote terminal sites are to be linked with the central data base. If only one is involved, a point-to-point network is ideal; otherwise, a network designed for multipoint interconnections is necessary.

This first round of elimination on the basis of form of transmission and the need for multipoint connections will considerably narrow the field of contenders.

(Continued on SR/16)



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Selecting the Ultimate Value-Added Network

(Continued from SR/15)

The next, more complicated level of consideration concerns speed, both in the sense of speed of transmission and in terms of the user's need for on-line rather than batch transmission. On-line service provides immediate and continuous access to the data base. With a batch system, information is sent, without interactive capability, on a delayed basis at one time — usually nonpeak periods.

Although inexpensive, batch transmission is inherently limited by the inability of interaction between the remote and central systems. An insurance company, for instance, can efficiently use a batch system to send payment information to a central data base after working hours. An airline reservations agent, on the other hand, needs to tap into and manipulate a data base continuously during the day, making on-line service necessary.

Similarly, having to dial up and log in each call would be impossibly inconvenient and time consuming for high-volume users. These users should consider networks that provide permanent virtual message circuits. With such a system, all of a user's transmissions between any two points always travel exclusively over the same path, eliminating the need to dial each separate message.

Such permanent virtual-circuit networks transmit at medium to high speeds, 4,800 to 9,600 bit/sec, while dial-up networks send at a low 1,200 bit/sec. Transmission speed is determined by the nature of the computer and terminals used. The IBM 4300 mainframe, for example, communicates at high speeds utilizing the Synchronous Data Link Control protocol. A user that has such a system will automatically be required to employ a network that accommodates that protocol at high speeds. Not all of them do.

Another important factor in the selection process is the distance over which communication travels. One company, for instance, had a central data base at the corporate headquarters in Massachusetts and needed to communicate with remote sites in Texas, California, Minnesota and Pennslyvania.

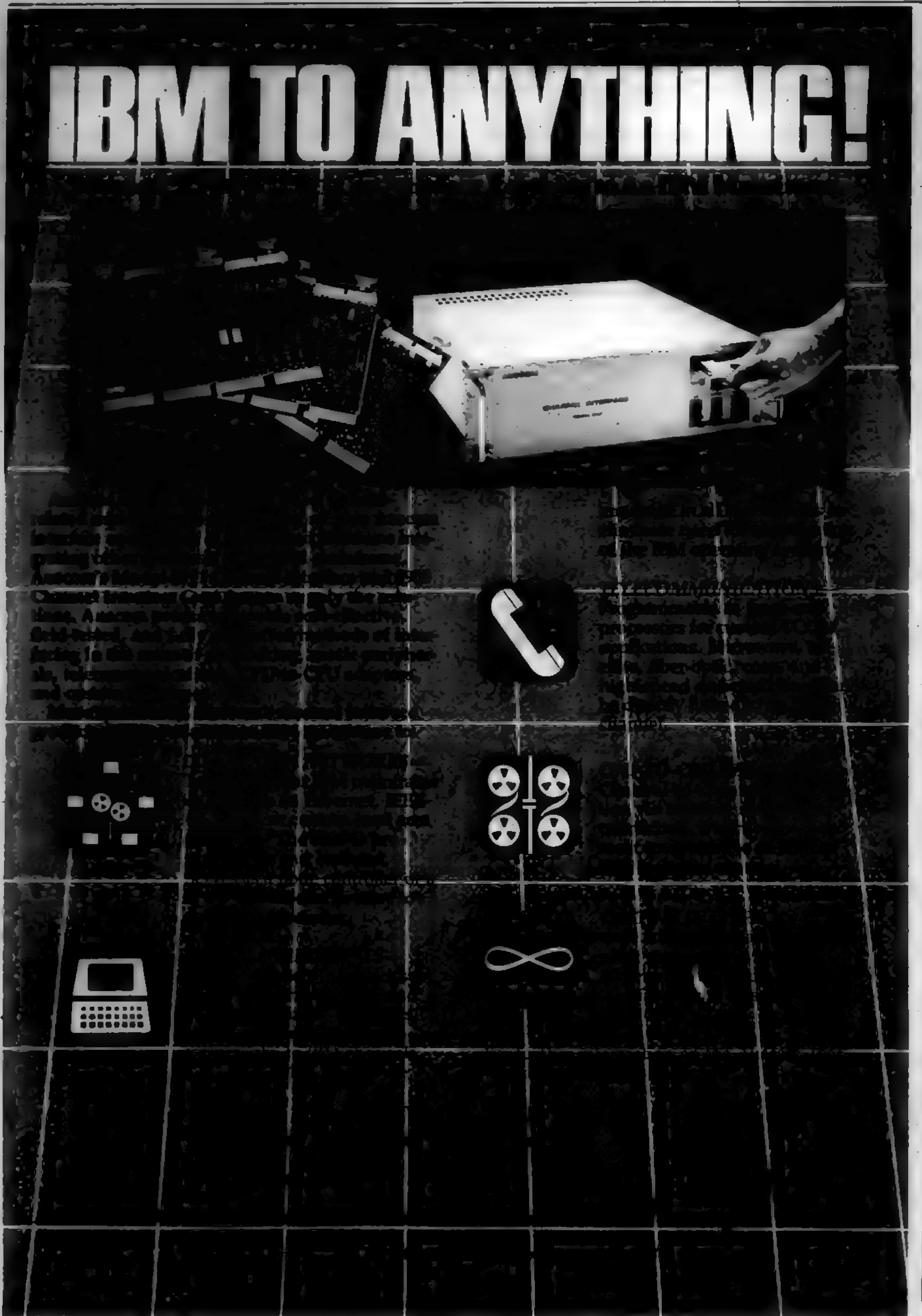
The company discovered that AT&T leased-line service to locations west of the Mississippi River cost $300 a month more than to points east of the Mississippi. In this case, a value-added satellite network that bills on the basis of volume, rather than distance of transmission, is clearly more cost-efficient.

An additional element that is often overlooked is reliability. Factors of line and/or atmospheric interference cause considerable differences in the error rates of various forms of transmission. There is some margin for error in voice and video transmission, in which enough data or information is conveyed for the receiver to extrapolate the meaning of a message or image, even if certain bits are missing or scrambled.

Even with textual data, transmission problems that cause errors in punctuation or spelling are not catastrophic. But with numerical data, such as would appear in inventory control, financial information and travel booking, variations in decimal points or individual numbers can have a huge impact. In fact, there is no margin for error.

Such situations require highly accurate and effective error detection.

· Young is vice-president of marketing with the RCA Cylix Communications Network, Memphis, Tenn.



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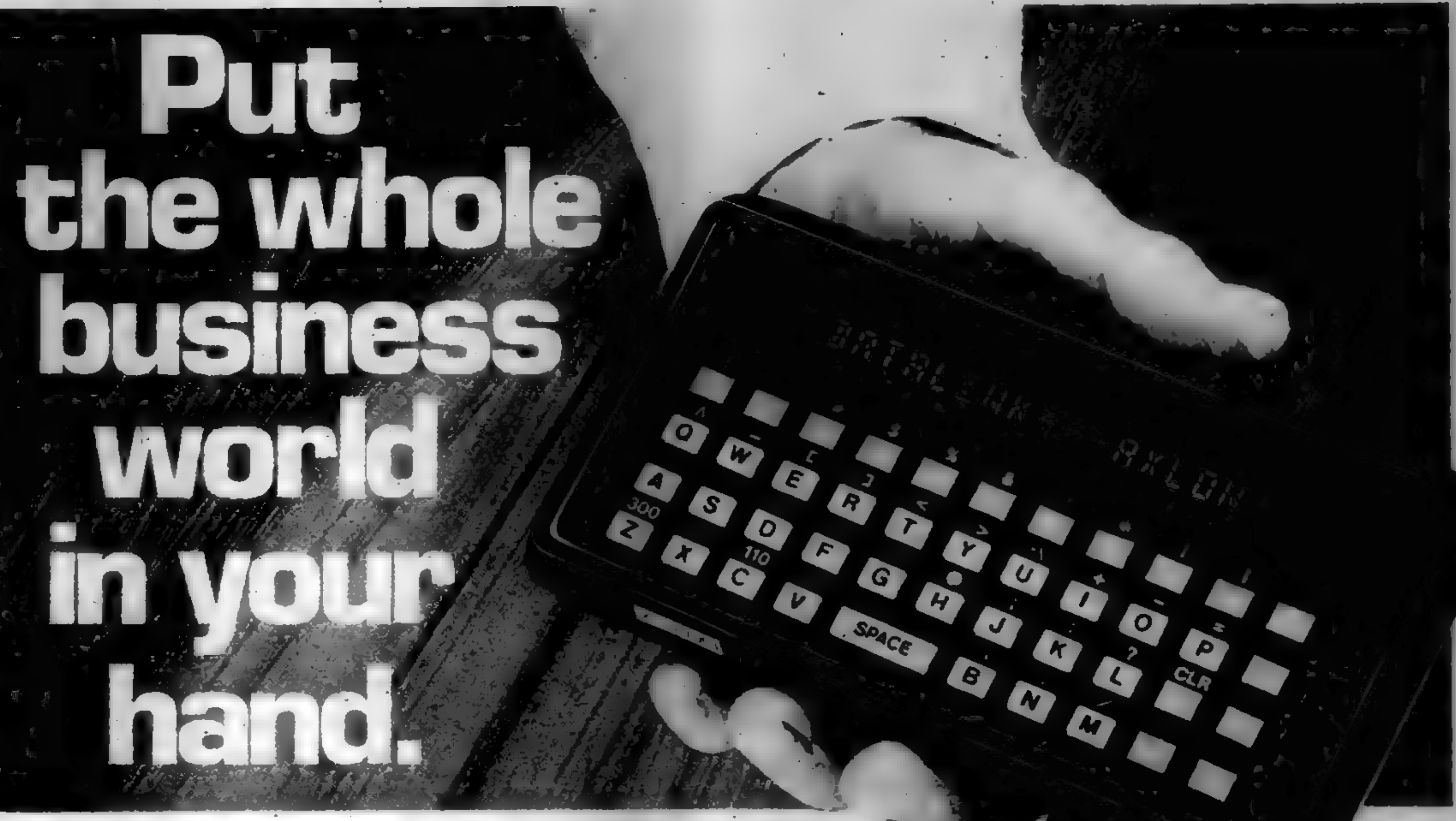

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Net Concentrators Monitor Traffic, Control Downtime

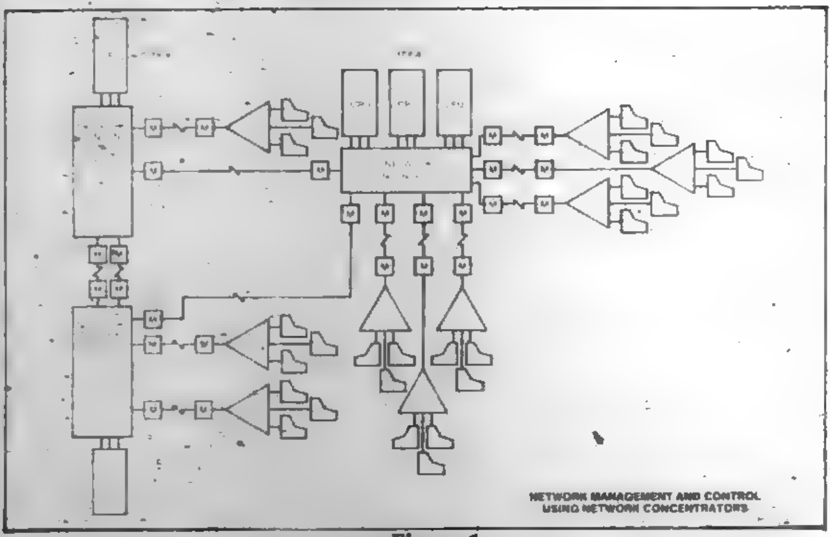


Figure 1

(Continued from SR/14)

tistical multiplexers is that although they offer users the highest degree of network operating economy; they increase the risk of serious problems in case of channel or device malfunction.

Additionally, because major networks are extensive, downtime on any one leg can seriously impair the functionings of an entire organization. A typical example might be the vast electronic funds transfer systems that are now vital to the existence of modern banking or the operations of a multinational manufacturer.

Modern statistical multiplexing, with the introduction of sophisticated data communications equipment such as the network concentrator, is now able to attack and control the bugaboo of network downtime. As with any complex organism, from the human body to an elevator system in a modern skyscraper, the whole secret is diagnostics — checking for symptoms that trouble is brewing.

High Speeds

Modern networks handle such high volumes of traffic at such high speeds that the red and green diagnostic lights that can be found on almost all individual elements in a network, down to the most modest modem, are not really of much help in this diagnostic process. Network dynamics today are such that by the time a remote operator notices a red light glowing on some panel, the fact is already in the fire.

It is here that the user can have protection through the new generation of data communications equipment — network concentrators. The concentrators are sited at the key gateways of the network.

They are part of each CPU front end and are at the prime nodal points of remote clusters. Through them, any device within the network has the capability to communicate with any other device (see Figure 1).

This interdevice communications function, as well as the fact of the movement of all traffic through the concentrators, gives the user a number of advantages. For one thing, the units are able to monitor constantly device performance and line performance.

They are also able to monitor and record traffic volume, error rates, events and other historical data, including the utilization of buffers and the lengths of queues in real time. All these capabilities protect against network failure.

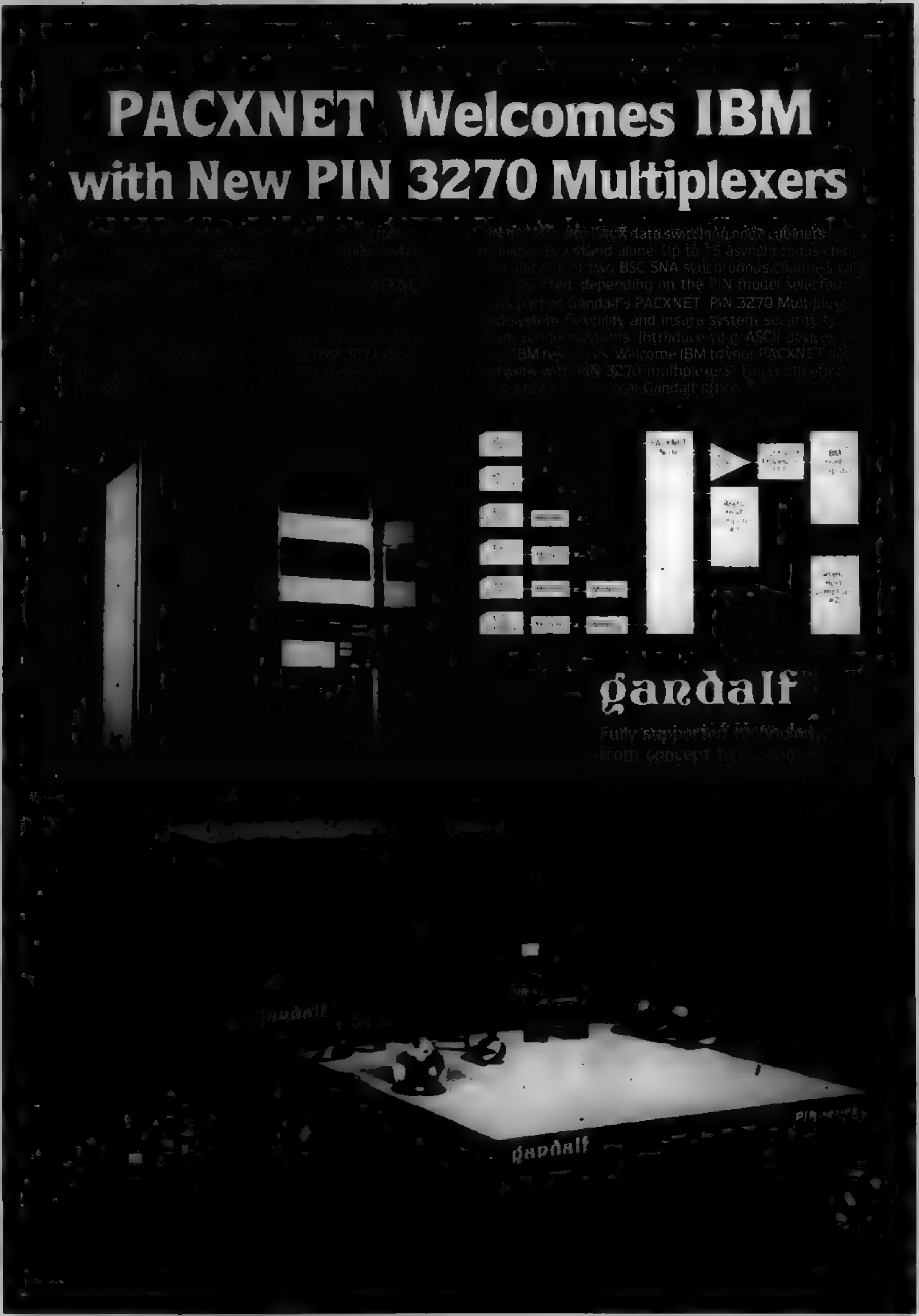
The Next Logical Step

Armed with these capabilities, plus strategical siting, the next logical step has been taken with the assignment of the responsibility for monitoring to network concentrators and providing them with the ability to take remedial action.

A data communications vendor with vision bases its design for a concentrator that both monitors and acts on one key assumption: Changes in the modern network environment occur so rapidly that human intervention is just not adequate.

This modern approach to network failure meets requirements for the user with a console system. The concentrator system configuration includes a CRT display of the network with graphics and a menu display of all network paths as well as detailed network segment displays down to the most remote network element.

Barnes is senior product manager with Infotron Systems Corp., Cherry Hill, N.J.


PACXNET Welcomes IBM
with New PIN 3270 Multiplexers

gandalf

Hospital Finds Cure With Self-Developed Net

By Bill W. Mathis
and Mary Elise Biergert
Special to CW‡

LOUISVILLE, Ky. — How does an organization begin to build a private information network from scratch?

High technology has presented so many options that the task of bringing these diverse elements together in a cohesive, workable system may seem overwhelming. The genetics of network building are such that elements can be combined into any number of hybrid blends, of which no two may be exactly alike for any two organizations.

Going the route of commercially available networks does not necessarily make the choice any easier. Even among these predeveloped systems, the multiplicity of functions offered is staggering. An absence of established, industrywide standards in network technological development further complicates the selection.

However, an effective network can be self-developed. It takes a set of clearly formulated objectives, a thorough familiarity with a wide range of available technology and a flexible, phased approach to the entire process. Competence in managing high technology and a proper mix of technical staff expertise are also definite musts.

The first and most critical phase of network development is in determining and defining the organizational objectives that the network is intended to accomplish. Networks can be doomed to failure from the start before the first hardware is ever in place if objectives have not been well thought-out.

Another related pitfall in network design is placing an overemphasis on technology while underemphasizing objectives. Both are imperative, but failure to give objectives primary consideration can result in a white-elephant network in which technology is badly mismatched to original intents.

Once appropriate, attainable objectives have been formulated, they can be spelled out in design elements to serve as basic blueprints of network architecture.

Network construction — assembling the building blocks of hardware, software and communication links — should follow logically from stated objectives and a detailed master plan into a configuration that uniquely addresses the organization's needs.

A few network prototypes are being developed in the health care industry, utilizing fully integrated clinical data bases in geographically distributed network configurations.

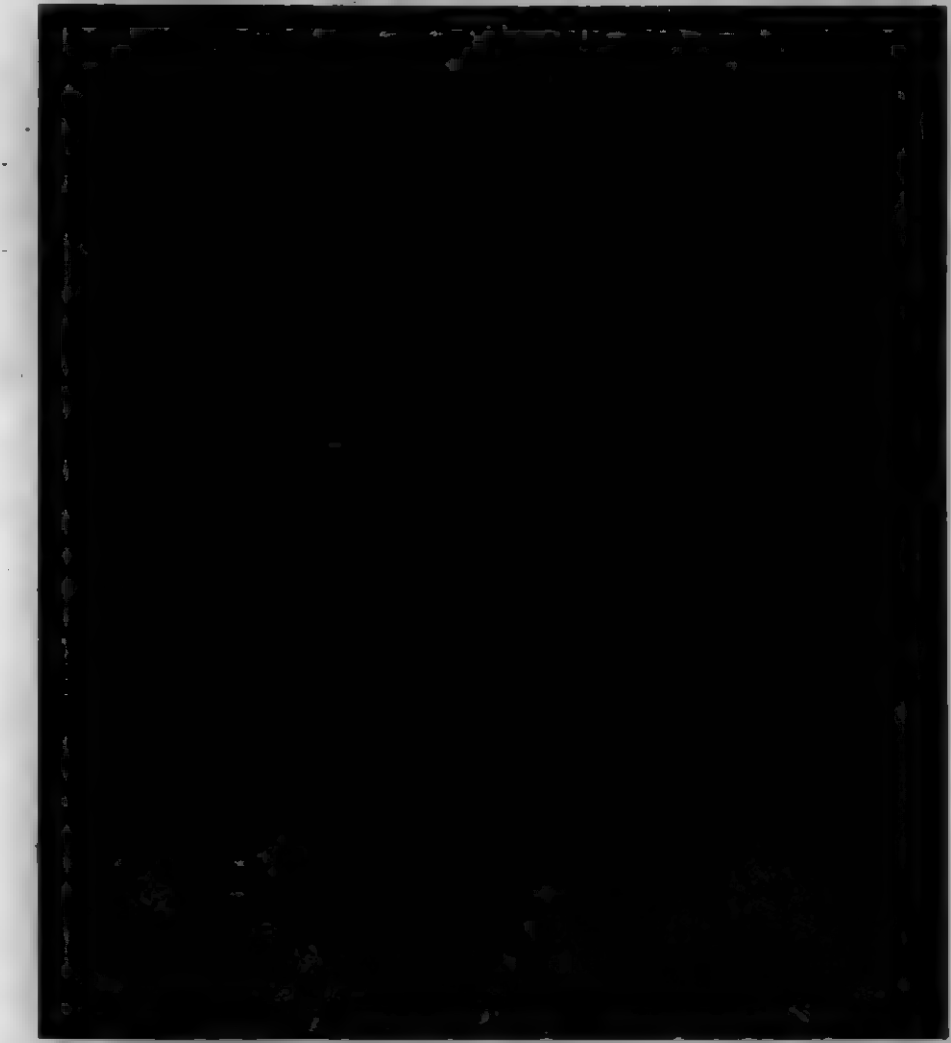
One successful network of this type is Health Data Network (HDN), established in 1970 by Baptist Hospitals, Inc. as its agent for developing a multihospital system of shared data processing services.

From central computer facilities in Louisville, Ky., HDN extends services across 500 miles to five hospitals and several physician practices in widespread locations.

HDN provides a completely self-developed, on-line, real-time health care information network, integrated for use by hospital administrative staffs, nursing personnel and most ancillary departments. It is also used by physicians from their offices and within the hospitals.

Currently, the network is interfaced with Blue Cross/Blue Shield of Kentucky for filing insurance claims and is interfaced with an automated bank clearinghouse for direct deposit of hospital em-

(Continued on SR/20)



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Please call the regional office nearest you for more information about the new CMX system: Santa Clara, CA, (408) 496-6464; Burlington, MA, (617) 273-5858; St. Louis, MO, (314) 434-1024; Dallas, TX, (214) 385-7090; Los Angeles, CA, (714) 553-1771.

Ungermann-Bass

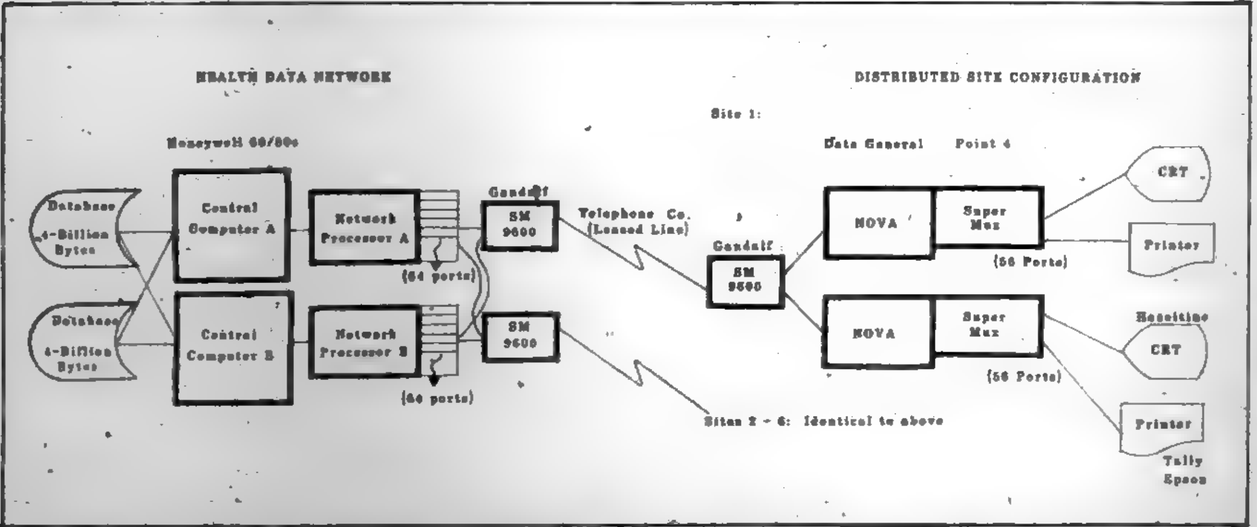


Diagram above depicts distributed site consisting of 12 Data General Corp. Nova systems located at six sites.

Hospital Builds Info Network From Scratch

(Continued from SR/19)

ployee paychecks.

The basic objective of HDN is to manage clinical and financial information resources to improve patient care. Three design premises form the core of the network:

- Information must be available to health care personnel wherever and whenever it is needed.
- Health care personnel must have control of and bear responsibility for information they process.
- The computer system must approximate what happens when it happens at all points in the network.

Because health care information demands a high uptime operation, HDN maintains its services 24-hours a day, seven days a week.

HDN chose not to rely on commercial software packages and instead has developed all of its software applications, based on extensive input from hospital department staffs.

Actively involving the end users in systems design has resulted in highly functional software. Hospital staffs are also encouraged to participate in system enhancement by submitting their suggestions for improvement.

Multivendor Approach

For maximum flexibility in hardware management, HDN takes a multivendor approach. It purchases equipment on an OEM basis after its in-house engineering staff has researched and evaluated products the market has to offer. Following this policy, the network can select state-of-the-art equipment that gives the most performance for the dollar.

The multivendor policy is reflected in the variety of network hardware. The central processing system consists of two Honeywell, Inc. 6680 systems. These systems have large-volume disk drives having 8G bytes of memory.

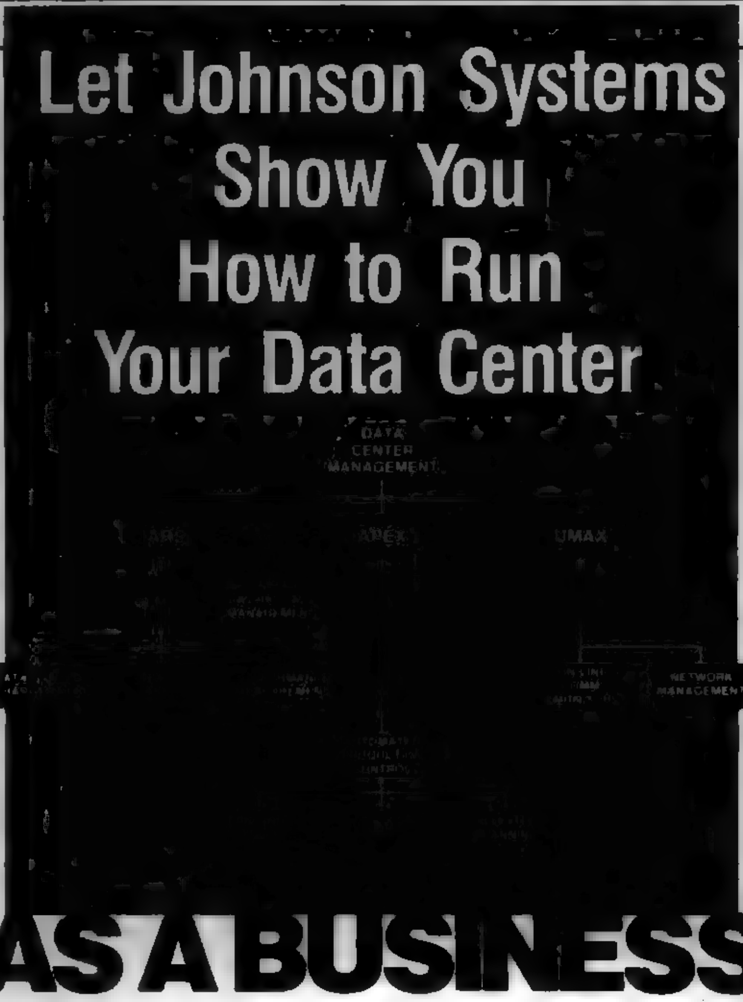
The CPU is actually tandem computers, hard-wired together to act as a single unit. Both mainframes are run by one master copy of the operating system.

The double advantage in such a redundant system is that each computer serves as a backup to its twin, and the work load can be shared between the two.

Network reliability is maintained by an uninterruptible power system, consisting of a diesel generator and battery pack. The power supply automatically drives the network if the utility company service fails. In addition, the engineering staff is on call around the clock for maintenance to the system.

For future development, HDN plans to replace all land-based channels with a single satellite channel by 1985. Voice and data transmissions by satellite are intended to increase both the reliability and the reach of the network.

Mathis is president of HDN in Louisville, Ky. Biegert is a staff writer at HDN.



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Will Offer Video, Voice Transmissions

AT&T's T-1 Digital Line Service a Boon to Users

By Ed Botwinick
Special to CW‡

What well-established communications facility is almost inaccessible to end users, yet is one of the most important factors supporting efforts to automate the office via digital networks?

The answer is T-1, AT&T's name for a digital communications line running at 1.544M bit/sec. To understand why, some background is needed to indicate how the present conditions are creating an opportunity for ultrawideband transmission.

In order to facilitate efficient switching and transmission within the telephone system, the analog voice signal from a standard telephone is generally digitized once it reaches the central office. Each voice channel requires 64K bit/sec of digital transmission bandwidth.

Within the telephone system, digitized voice channels are then multiplexed in groups of 24 requiring an aggregate 1.54M bit/sec of transmission bandwidth. This 1.54M-bit transmission link is known in the telephone world as a T-1 facility. Because so much equipment is available for telephonic use to run at that precise speed, it has also become a de facto standard for many satellite and digital radio transmission systems.

Until about two years ago, T-1 facilities were available only for internal use within the Bell system. When AT&T's Telpak service was discontinued, user demand and a court order made leased-line T-1 service available to subscribers.

T-1 Availability

However, T-1 is currently difficult to obtain under the traditional business philosophy of many telephone companies. Offering T-1 links directly to users is considered to be a cut-rate, wholesale service that reduces total revenues. Telephone company managers who are more in tune with data communications and future office needs have come to realize that the effect will be anything but that.

The availability of private-wire T-1 service will undoubtedly be the catalyst for the creation of a multitude of new uses for it. For example, video teleconferencing systems are now available that will allow high-quality video to be transmitted over a single T-1 facility. This compares with the four T-1s that were required for the now-defunct Picturephone service.

Newly developed signal processing technology shows promise of reducing this to 256K bit/sec or less without significant loss of picture quality. This means that private video teleconferencing links can share T-1 facilities with other applications, reducing the amount of travel required for conferences and meetings.

Similarly, high-speed digital facsimile systems are already on the market with the capability of transmitting a page of information in well under a minute on voice-grade lines. With minor modifications, many of these units could transmit at several times that speed if there were transmission facilities economically available to take advantage of those capabilities. But only the highest volume users can afford these facilities today. Economical T-1 service, however, would make this extremely cost-effective for a much wider user base.

There are other uses for T-1 service. Most distributed data communications today operates over voice-grade lines (up to 14.4K bit/sec or Dataphone Digital Service rates up to 56K bit/sec). Increasingly, there are needs for even higher speed computer-to-computer links. These may be used for consolidation and updating of data bases or for maintaining backup copies of programs and data at a remote location for use in case of a major power or equipment failure or some other crippling catastrophe.

Until the availability of T-1 service, this was feasible only for the largest users who had access to private satellite links and, even then, could be effective only between those locations that had earth stations. Because T-1 will soon be widely available, however, small- and medium-size users can begin to think in terms of ultrawideband facilities.

Far from causing the phone companies to provide wholesale discounts, T-1 should be an extremely profitable new service. Because T-1 is inherently a low-cost entity, it can bring many new users and applications onto the network.

The reason for this is simple. Much of the existing copper telephone wire installed today can be inexpensively upgraded from voice grade to T-1, through the installation

(Continued on SR/24)

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DISTRIBUTED PROCESSING NETWORKS

Another in a series of messages on advanced technologies from Honeywell Information Systems.

Many data processing professionals are being faced with demands for networks capable of moving increasing amounts of data among more and more locations. Up to now, application-dependent network structures—with their inherent risk of major conversions—offered the most readily available response. Honeywell's Distributed Systems Architecture (DSA), however, provides a more practical alternative. An application-independent networking structure, it fully supports public, value-added, private and international nets.

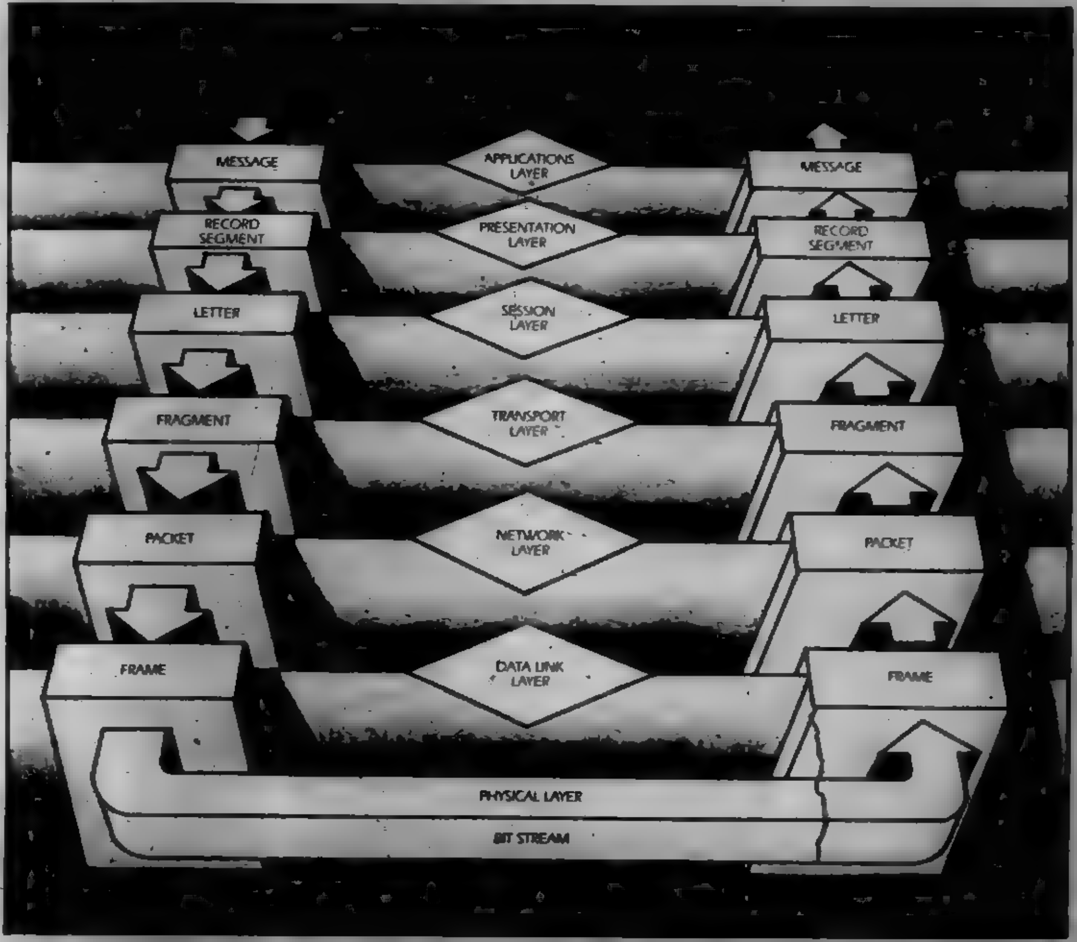
World-Class Networking Today
Honeywell's DSA establishes standards for data movement and application cooperation in compliance with the International Standards Organization's (ISO) open systems reference model. The architecture, which is not dependent on specific technology or techniques, keeps applications and communication processes separate. Thus DSA is transparent to the end user. DSA creates a cooperative, flexible environment within which the user can build and phase in a communications system that can handle current applications and grow to meet new domestic and international demands.

DSA Structure
DSA's flexible set of rules, protocols, and interfaces allows users to configure and implement data processing systems and networks to help meet the needs of geographically dispersed organizations. Introduced in 1980, DSA consists of a seven layer architecture divided into three groups. The implementation of the first four layers in the Communications Management group controls physical exchanges across the network. The next two layers, the Message Management group, format messages so that the communicating entities can understand each other. They also contain the dialog mechanism that permits communicating activities to synchronize their actions, and the presentation control services which provide application independence from data format, character codes, and terminal handling conventions. The seventh layer, Applications, defines the logical rules to which computer applications conform when communicating. Finally, each layer of DSA also provides network administration and control data to enable overall network control of the distributed system.

Network Support
Because DSA conforms to the ISO open systems model, it's certified as providing native support for the CCITT international X.25 packet-switched and X.21 circuit-switched network protocols. These protocols are being implemented in a growing list of public data networks around the world as well as in value-added and private networks. DSA products support such X.25 based networks as TELENET and TYMNET (United States), DATAPAC (Canada), DATEX-P (Germany, Austria), DDX-P (Japan), DN 1 (The Netherlands), EURONET (European Economic Community), PSS (United Kingdom), EDWP (Switzerland), and TRANSPAC (France). Also supported is the X.21-based NORDIC Net (Scandinavia, Finland). DSA uses High-level Data Link Control (HDLC), also an ISO standard, for data communications between intelligent devices in private networks. Users can configure hierarchical, peer-coupled and hybrid network topologies.

Product Implementation

DSA already enables medium-scale and large-scale host computers and mini-computers to operate in a variety of network configurations. Specialized network processors can be utilized for front-end processing, remote concentration and switching, in addition to communications control and administrative functions. The implementation includes such distributed processing applications as file transfer, remote job entry, terminal concentration and two-level transaction processing as well as office automation applications, including document distribution and host storage, and printing of documents. In addition, DSA administration permits monitoring, control, and maintenance of the network from one or more control sites.



DSA consists of seven layers of functions and protocols governing data handling among network nodes. DSA's implementation of the bottom four layers makes physical exchanges across the network transparent to the end user.

Future Growth

DSA is an important part of Honeywell's implementation of its Distributed Systems Environment (DSE). Future DSA developments will support fully-distributed transaction processing with system-supplied coordination, control, and recovery, load leveling, and resource sharing across computers. This type of peer network will allow host and satellite processors to cooperate as full equals in distributed systems. The open architecture will be further enhanced to meet evolving international network standards while protecting investments in systems already installed. Additionally, data bases will be partitioned across multiple processors with automatic access and updates at all locations. Thus DSA is part of an evolution to fully distributed systems with globally accessible resources.

More on Distributed Processing Networks

For an in-depth description of the DSA open architecture call our toll free number, 800-343-6294 (in Massachusetts call 617-552-2264) or write Honeywell, 200 Smith Street (MS 487), Waltham, Massachusetts 02154.

Overall Plan Needed for Corporatewide Nets

By Tom Rizzo
Special to CW‡

Today's managers of information systems and their associates in information supervision, telecommunications managers, must try to formulate an overall plan for information handling within the corporate environment.

Obviously, the all-inclusive network to be developed must deal with analog voice, digital data, keyboard-generated text, software-enhanced graphics, freeze-frame and continuous video as well as hard-copy image or facsimile. The aim here is to provide conduits or processes for applications development, not just a proliferation of electronic, feature-laden gadgets.

These processes or categories can be manipulated presently via several technologies that will form the nucleus of the integrated systems that are rapidly taking form. These prime technologies include the voice/data private branch exchange (PBX); local-area networks; electronic message and document distribution, both voice and hard copy; and executive workstations and teleconferencing.

With a knowledge of the technologies to be investigated, the next step appears to be the choice of the initial system to be put in place or the cornerstone to be laid.

Arriving at this point, most managers will immediately realize that they need more than one type of network due to current technological availabilities and constraints as well as different applications demands.

Because at least 80% of all communications still appears to be voice rather than data, the selection of an integrated voice/data PBX will be the initial thrust or first step into the contemplated integrated systems network plan for the corporation. This is because it provides solutions to both verbal and digital corporate communications needs.

But other than voice, why should the integrated office controller or focal point of the network be an integrated voice/data PBX? Consider the following mitigating factors: the almost universal availability of two-twisted-pair wiring in existing buildings, the familiarity of present-day office workers with telephone-type equipment and the already-developed expertise of telephone technicians to service installation.

Also important is the flexibility in reference to distance that can be accommodated by devices using two-twisted-pair wiring, the large number of different devices that can be connected, the multifaceted communications interfaces to other common carriers and value-added networks

(Continued on SR/26)

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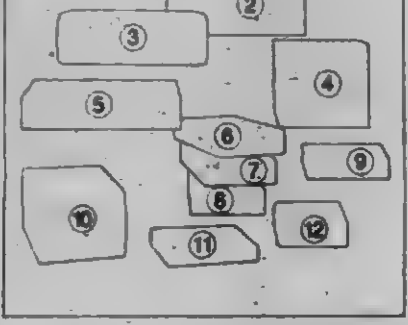

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6. 2283: 1200 bps, full duplex
7. 2082: 1200 bps
8. 2084: 2400 bps
9. DCB MK2: 600 to 19,200 bps
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AT&T's T-1 Line Benefits Users

(Continued from SR/21)

of low-cost repeaters every mile. The phone company can then rent or lease this facility at a sufficiently high multiple of the voice-grade rate, perhaps four to eight times. This would provide a very fast return of the cost of upgrading the line to T-1 at a much greater profit to the operating company thereafter.

The user, on the other hand, considers that he is getting a bargain, with the equivalent of 24 voice-grade lines at a fraction of the equivalent cost. The new applications that will undoubtedly arise to fill this bandwidth are examples of the pervasiveness of commercial technology and the significant elasticity of markets under the influence of technology-driven cost and price reductions.

T-1 service can be obtained as a specially engineered facility in many parts of the country. Many telephone operating companies are beginning to realize the opportunities offered to them by providing tariffed T-1 service. Several are now in the planning stages for a formal offering.

Managing T-1

When T-1 service is readily available, users will require an electronic management system to divide the T-1 bandwidth into speeds that are compatible with normal data processing uses and to manage effectively that facility by switching portions of it between wideband uses that do not need to operate all the time.

To solve that emerging need, Timeplex, Inc. has been developing Link/1, a family of T-1 Facilities Management Systems that will enable a large cross-section of users to begin to realize the true promise of future office services, economies and conveniences. They may then also take advantage of capabilities that are already available for computer communications, but have previously been too costly for the average user.

Botwinick is president of Timeplex, Inc. of Rochelle Park, N.J.

Improve Performance, Cut Costs

Monitoring Systems Aid Network Managers

By Tim Ahlstrom
Special to CW‡

American business has invested billions to establish and run data communications networks linking farflung sites and providing immediate access to central data bases and computing power. Staggering sums have been spent because data communications has become essential to business operations.

Banks authorize and record credit-card purchases and offer 24-hour services through automatic teller machines. Insurance companies process premiums and handle claims from agents' offices. Engineers design cars. Travel agents book passengers, assign seats and write tickets. Shippers track freight. Retailers manage inventories at warehouses and process updates from point-of-sale terminals. The list is endless — users and computers are tied together by expensive networks.

Typical costs average $1,000/mo or more for each line and $1,500/mo for each terminal and operator. Thus, an average 100-line, 1,200-terminal network costs nearly $2 million in monthly network expenses.

Data communications networks were set up because corporate managers realized that information is a fundamental corporate resource. So, while the network is a necessity, it is an expensive one.

Now, after a decade of expanding networks, after years of meeting other peoples' information needs, network managers are defining their own needs for information. Operating, managing, improving and growing an expensive corporation network, requires information. Network performance monitoring and management systems, such as Avant-Garde Computing, Inc.'s Net/Alert, can provide much of the necessary information.

Operationally, network managers need information that describes status, performance and utilization, defining service levels and availability to users. Critical status and performance indicators include response times, traffic volumes, error rates, time-outs, no-polls, equipment and facility failures (see figure on SR/28).

Network staff need these indicators in real time so problems can be identified quickly by early warning of service degradation or overload. They need the information for the highest level of aggregation — the network — to the lowest level of detail — the terminal — with all levels in between — lines and regional groupings, for example.

Users view network performance as good response-time and on-demand availability. As a result, managers need response-time statistics for each device, line and line group as well as for the network as a whole. Response-time statistics for various types of applications or transactions make it possible to see not only how well the network is working, but also how well it works for a specific task.

This type of performance information allows network managers to set, evaluate and meet service objectives, validate service contracts, audit service charges and define precisely the impact of various applications on the network and the host. Perhaps most importantly, it enables

(Continued on SR/28)

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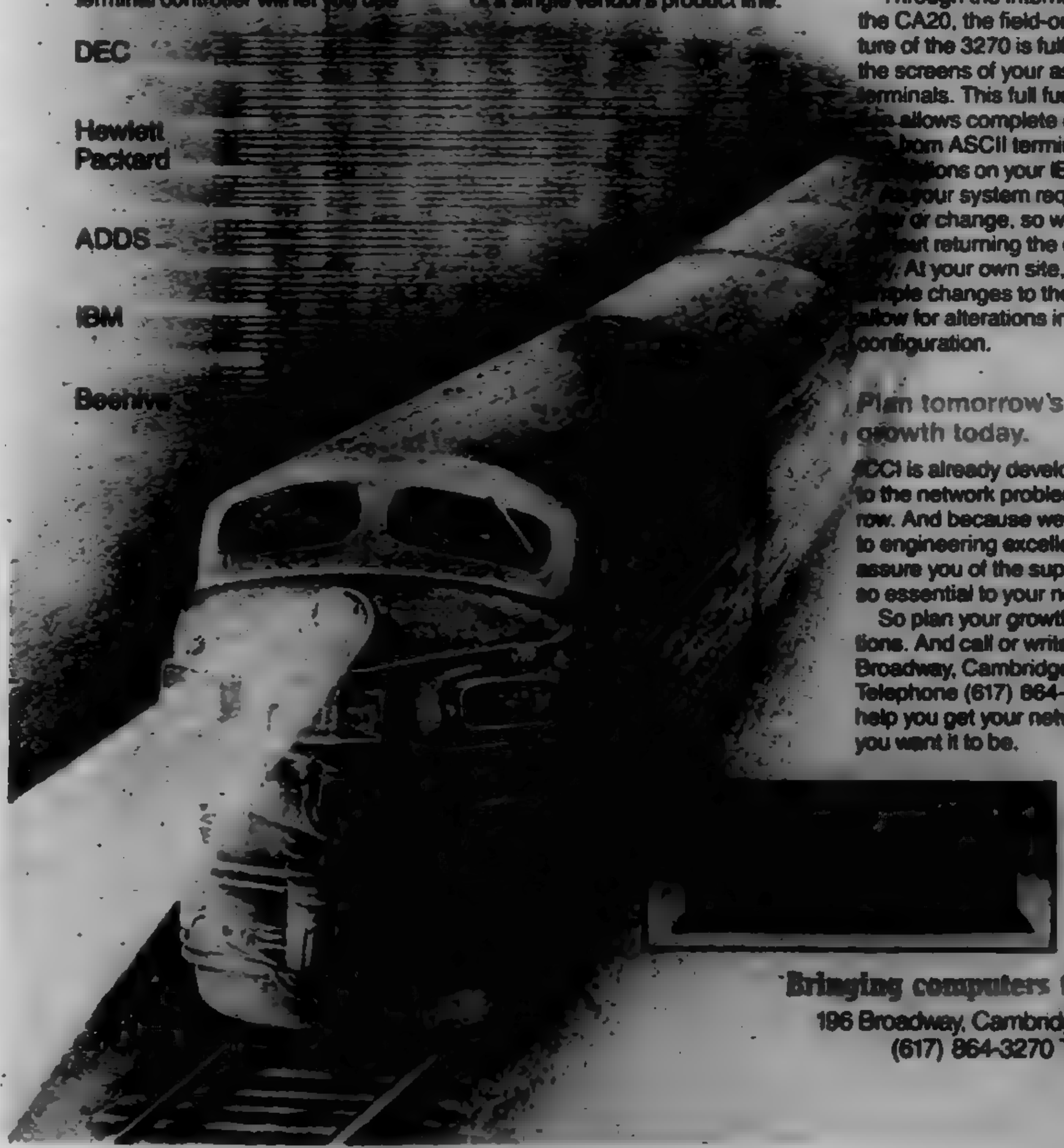

The CA20 grows with your system.

The CA20 fully supports IBM's binary synchronous communications (BSC) and systems network architecture (SNA/SDLC) 3270 protocols. With the CA20, you can convert your asynchronous terminals to either of these protocols without additional costs.

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Overall Plan Necessary to Corporate Networks

(Continued from SR/24)

and the data switching capabilities.

Admittedly, these are only some of the benefits that such an approach would provide.

But to make sure that these advantages become a reality and do not remain vague marketing promises, it must be certain that the integrated systems controller or PBX to be installed offers the following upon installation:

- Simultaneous integration of both voice and data, based on an integrated systems design as its chief goal.
- Networking or interface capability to other systems already in place or to be added in the future.
- Capability to integrate multiple devices supplied by multiple computer, telecommunications and office equipment vendors.
- Gateway to all major common carriers.
- Modemless internal data operation.
- External modem pooling capability.
- Port contention and port selection for data applications.
- Asynchronous and synchronous data capabilities.
- IBM 3270 emulation.
- X.25 packet-switching accessibility.
- Architecture truly designed with office automation/integration as a goal.
- The ability to cover a large geographically dispersed area with a truly distributed systems architecture.
- Electronic equipment that can handle not only voice features, but also data applications.
- High nonblocking system availability with total systems redundancy throughout the architecture.

But what about video, high-speed data transmission beyond 56K bit/sec, connection of personal computers and other data-handling capabilities?

Why not implement these solutions as individual or separate building blocks within the total systems architecture of the corporation as needed?

Future Interfaces

At least with an installed digital voice/data PBX with intrinsic integrated systems design capabilities, there is the distinct possibility that future interfaces will be developed to interconnect the systems and bring in these other networks when and if it is desirable to do so in the future.

In reality, then, the integrated voice/data PBX, if used as the fulcrum for systems integration or as an integrated office controller, will not preclude or diminish the specific technical advantages of other local-area-type networks.

In all probability, the launch into the future should come through the integrated voice/data PBX. This first step should not be initiated without a total corporate strategy. This plan should include input from all disciplines, telecommunications, data processing and office automation/integration, regardless of their political positions within the corporate pecking order.

The integrated voice/data PBX certainly is not more or less appropriate than a local-area network with a coaxial cable in order to harness the energy of the present-day communications explosion. It just makes good business sense to use the all-pervasive phone network already in place for functions other than voice communications, because this is an idea whose time has definitely come.

Rizzo is the chief executive officer of the consulting firm RFC Systems Integration of Dallas.

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Keeps Tabs on Sweet Sales

Portable Terminals Scout Council's Cookies

DAYTON, Ohio — Girl Scout cookies are big business — especially when it comes to keeping track of how many are sold and by whom. That task is the responsibility of the local Girl Scout council — one of many challenges to a council's accounting and record-keeping abilities.

Like many other councils around the country, the Buckeye Trails Council has turned to computer technology to control inventory, process information and streamline record keeping. Using portable data terminals and a small business computer system from Texas Instruments, Inc., the council manages both the annual cookie sale and its day-to-day financial operation more efficiently.

The Buckeye Trails Council, located here, keeps track of cookie sales for the 1,200 troops in a seven-county area. Last year, that meant keeping tabs on 1.1 million packages of cookies.

The council stores all the information about the cookie sale in a host computer at the University of Dayton and has selected a TI Silent 700 Model 745 Portable Data Terminal to communicate with the computer. This allows council members to keep accurate, current information available to troop leaders and council professionals as the annual four-month sale progresses.

"In the past, a scouting volunteer kept records for our cookie sales with a manual accounting system," said Ed Desorcy, assistant executive director for financial services of the Buckeye Trails Council. "This was adequate when we began the sales with a volume of 400,000 to 500,000 packages of cookies, but then we started to expand and needed help processing the information. With the TI data terminals, council bookkeepers now have a well-refined and efficient system for managing the annual sales."

The bookkeeper enters data on each troop into the data terminal and transmits it over the telephone lines to the host computer in Dayton. The standard information sent includes the name of the troop, identified by Girl Scout neighborhood and troop number; the number of members selling cookies; and the number of cookies received by the troop.

Then, as a troop gets additional shipments of cookies and deposits the sales receipts, reports are sent to council headquarters and updated via the terminal. The bookkeeper requests daily printouts itemizing the number of cookies each troop has taken to sell and their actual sales in dollar amounts.

To communicate with the host computer, the bookkeeper simply plugs the terminal into an electrical outlet, places a standard telephone receiver into the terminal's acoustic coupler and dials up the host computer. The daily printout is produced by the portable terminal's thermal printer.

"Our task is complicated by the fact that troops can swap cookies with each other, and they can also receive cookies from various 'cupboards' in their areas," Desorcy said. "The TI data terminal enables us to constantly update our records to reflect all the transactions. When the year's sale is over, we know whether

(Continued on SR/30)

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Monitoring Systems Help Managers Slash Net Costs

(Continued from SR/25)

managers to improve performance by telling them what the network is doing, when and how often, how well it is doing it and what the operating problems are. By showing them where they are, it helps them begin to get where they want to be.

Cutting Costs

But improving performance is only part of the network manager's job. Controlling — or cutting — costs is next.

Lines average about $1,000/mo, yet the average network has about 10% more lines than it needs. At the same time, it has saturated lines creating bottlenecks. Under-used lines could carry more of the load. Lines can be combined or eliminated, routes and traffic redistributed and dollars saved, but only with good information about line utilization.

Terminals and operators cost about $1,500/mo. Are there too many or too few? Are they located correctly? Are they where the traffic is? How does a manager know? Again, basic utilization information is needed so that under- and over-used terminals can be identified and shifted around and new terminals won't have to be added merely because a user says the current ones are swamped. Thus, money can be saved.

In addition to improving services and cutting costs, a manager also has to plan for the future; planning must be based on solid, useable information about current and historical use and performance, trends, unmet needs and excess capacity. This information will help keep services reliable, responsive and cost-effective as the network grows and as more sites and applications are added.

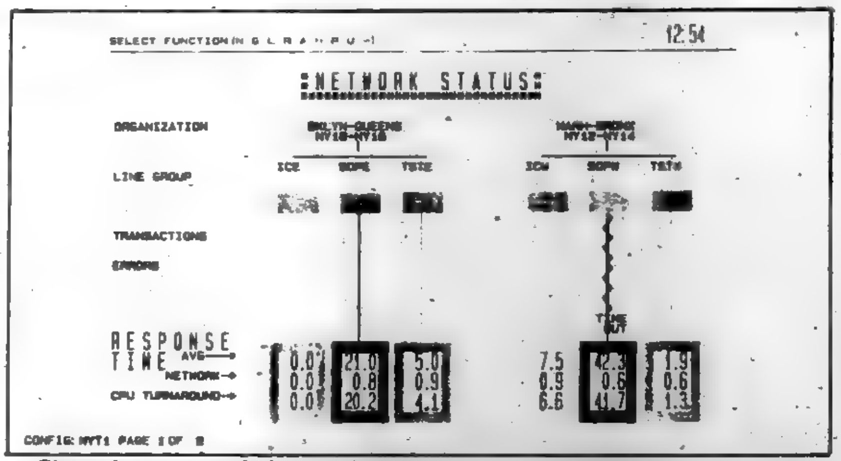
Application monitoring can play a special role in both evaluating services and planning improvements. Basic performance indicators show how well the network is working. Application monitoring shows how well the network handles each separate application, how each application affects response time or how it ties up the mainframe. It also provides detailed productivity analysis of each workstation by showing exactly how much of each type of work has been done at each station.

Data communications management in today's distributed processing environment is fast outpacing traditional concepts focused on technical control, line scoping, hardware troubleshooting and responding to escalating user service demands by adding more gear and new lines.

To meet the twin demands of improving services and controlling costs, today's network manager requires a web of useable information showing operational status and performance, historical performance and use, allowing him to identify and project trends confidently. That information can now be captured, stored and manipulated with existing and emerging technologies. It can be displayed in traditional tables and reports and in advanced color graphics. Most importantly, it can be made easily available to the network manager so he can do the jobs that are expected of him.

The task of network management is to deploy resources most effectively to achieve satisfactory performance and availability of services at affordable costs. An independent network monitoring and management system, such as Net/Alert, can assist by providing the information required.

Ahlstrom is president of Avant-Garde Computing, Inc. of Cherry Hill, N.J.



Operations status information is presented by Net/Alert in real-time, color-coded dynamic graphics. Performance thresholds are user set for major indicators. Information is summarized at network level, detailed for individual lines or aggregated at intermediate levels.

010110010

Bridge Micros, CPUs, Peripherals

Interface Units Extend System Capabilities

By David Misunas
Special to CW‡

Much attention has been paid recently to the use of protocol converters as terminal interface units, replacing IBM 3270 controllers and allowing the connection of asynchronous Ascii terminals or personal computers to an IBM-type host with full 3270 functionality. Many manufacturers, ranging from small start-up operations to IBM itself, have announced product offerings to perform this function.

The attractiveness of such terminal interface units lies both in the cost savings permitted by their use and the extended capabilities realized in the mixed-vendor, multifunction network. Perhaps the most exciting aspect of such extended functionality is that allowed by the combination of a personal computer and a terminal interface unit. Through such a combination, a user can perform required local processing and, when necessary, connect to the host system and interact as necessary with 3270 applications on that machine.

A typical example of an office with such a requirement is an insurance agency. The agency can perform many of the tasks and computations necessary for its operation locally on the personal computer and then interact on-line with the host to perform such tasks as policy generation and claim processing. The automation programs used in many insurance companies are beginning to exploit the protocol converter terminal interface units' technology in such a manner.

Contact with the host processor from an asynchronous terminal or personal computer connected to a terminal interface unit can be established in two ways. A small office may have only one or two personal computers or terminals and can dial a protocol converter at the host site with a low-cost asynchronous modem such as the Bell Laboratories 212 at 1,200 bit/sec, perhaps even using an inbound Wats line.

A larger office with many more terminals or personal computers and greater access requirements may have a protocol converter on-site with a leased line to the host. In this larger configuration, the user merely types a few characters on the keyboard to contact a host application.

A personal computer generally communicates with a terminal interface unit in the same manner as an asynchronous Ascii terminal. Thus, a mix of terminals and personal computers may be used on an individual terminal interface unit. Furthermore, a user station can be upgraded from a terminal to a personal computer merely by replacing the device connected to the terminal interface unit.

To perform such a 3270 emulation, a terminal interface unit must permit the asynchronous terminal or personal computer to support all functional characteristics of the emulated 3270 terminal. This involves not only the conversion of protocols from asynchronous Ascii to IBM Binary Snychronous Communication or Synchronous Data Link Control, but also the mapping of complex functional characteristics of the 3270 device into those of the specific asynchronous device.

Such a 3270 emulation is structured to require no modification of the host hardware or software for full compatibility. A user is able to disconnect the IBM terminal controller, connect the terminal interface unit, asynchronous terminals and personal computers and have full 3270 functionality.

The IBM 3270 family of devices operates in block mode. The host processor sends a block of data called a screen image to a 3270 terminal where it is viewed. Data entry or editing functions are performed locally at the terminal and the resultant screen image is transmitted to the host upon request of the user, usually after all local editing or data entry is completed.

To allow use of an asynchronous Ascii device in place of the 3270, a terminal interface unit performs all the functions of the block-mode 3270 device and maps those functions into the necessary mode of interaction with the asynchronous terminal. Thus, the terminal interface unit interprets all 3270 screen-formatting commands and orders to format the screen of an attached asynchronous device, providing the standard 3270 keyboard editing and data entry operations.

The keyboards of most asynchronous devices are only minimally compatible with the 3270 keyboard

(Continued on SR/30)

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Terminal Interface Units Increase Functionality

(Continued from SR/29)

structure and functionality. A 3270 keyboard has over two dozen single-key functions, whereas an asynchronous terminal may have only the alphanumeric keys plus a handful of functional keys.

For this reason, the terminal interface unit assigns keystroke sequences to the asynchronous keyboard to provide the 3270 functions. For example, to obtain a 3270 backtab function from the asynchronous keyboard, it may be necessary to type a sequence such as the Escape key followed by the Tab key.

To connect the personal computer to the terminal interface unit, the same mapping of Ascii character codes to 3270 functions is used, but much more flexibility is possible in the layout of the keyboard due to the programmability of the personal computer. For example, any key on the personal computer can be used to provide the 3270 Enter function merely by programming the personal computer to send the Ascii code for Return when that key is pressed.

Such changes to the keyboard mapping are at the discretion of the user; the personal computer can be used with the terminal interface unit directly without modification through use of a standard IBM 3101 display terminal emulation program within the personal computer.

Misumas is president of Industrial Computer Controls, Inc., Cambridge, Mass.

Girl Scouts' Cookie Sales Tracked by Data Terminals

(Continued from SR/27)

the troops owe us, we owe them, or we're even. And we also know that our information is accurate as we go along.

"The Buckeye Council Girl Scout sale is the largest in the state," Desorcy said. "Last year we had an 8% growth factor, with an average sale of 80 packages of cookies per Girl Scout. That's a lot of cookies and money to record accurately," he added.

"The entire staff, including troop leaders, relies on the printout as a source of up-to-date information on how the year's cookie sale is progressing. We've shown the complete program to other Girl Scout Councils and many are interested in acquiring it for their own cookie sales," Desorcy said.

The Buckeye Trails Council has also enlisted the help of a TI small-business computer system for managing daily record keeping, accounting chores and fund-raising activities.

"The Girl Scouts is a nonprofit organization; dependent upon grants and donations for our financial existence," Desorcy explained. "It is essential that we keep up-to-date records of our friends and supporters in order to maintain a healthy financial profile."

Before using the computer, the Buckeye Council fund-raising records were kept manually in individual card files. "Many times it took hours to zero in on specific donors," Desorcy continued. "In order to send a mailing to our friends interested in specific scouting projects, our staff had to review each card file and develop lists.

"With the computer all we have to do is enter the key information about each supporter into the computer, such as name and address, neighborhood, troop number, previous contributions and other special designations," Desorcy explained.

The computer can be used to arrange the information in a number of ways. For example, the operator can ask the computer for a list of contributors in a given neighborhood or for a list of total contributions earmarked for a specific project. A simple command provides a printed version of the newly arranged information on the system's printer.

"The TI computer allows us greater potential for using our information," Desorcy said. "We don't have the resources to sort and catalog the files manually.

"Now an unlimited amount of information is at our fingertips. For example, we like to send reminders and calendars to our contributors. Before we had a computer, keeping up with our supporters was a real chore. Now we don't forget anybody," Desorcy added.

"Managing our cookie sales efficiently and maintaining accurate records of our contributors are essential jobs for the Buckeye Council," Desorcy said.

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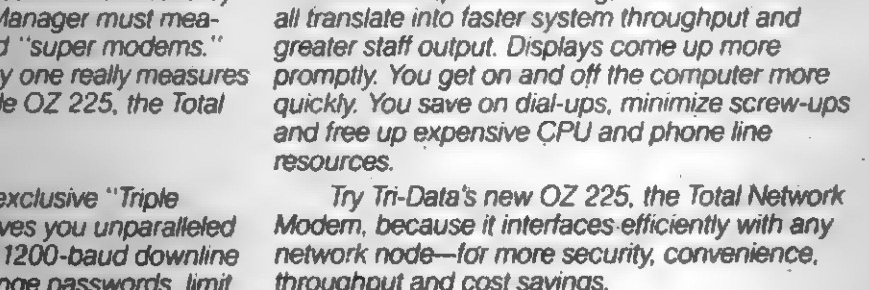

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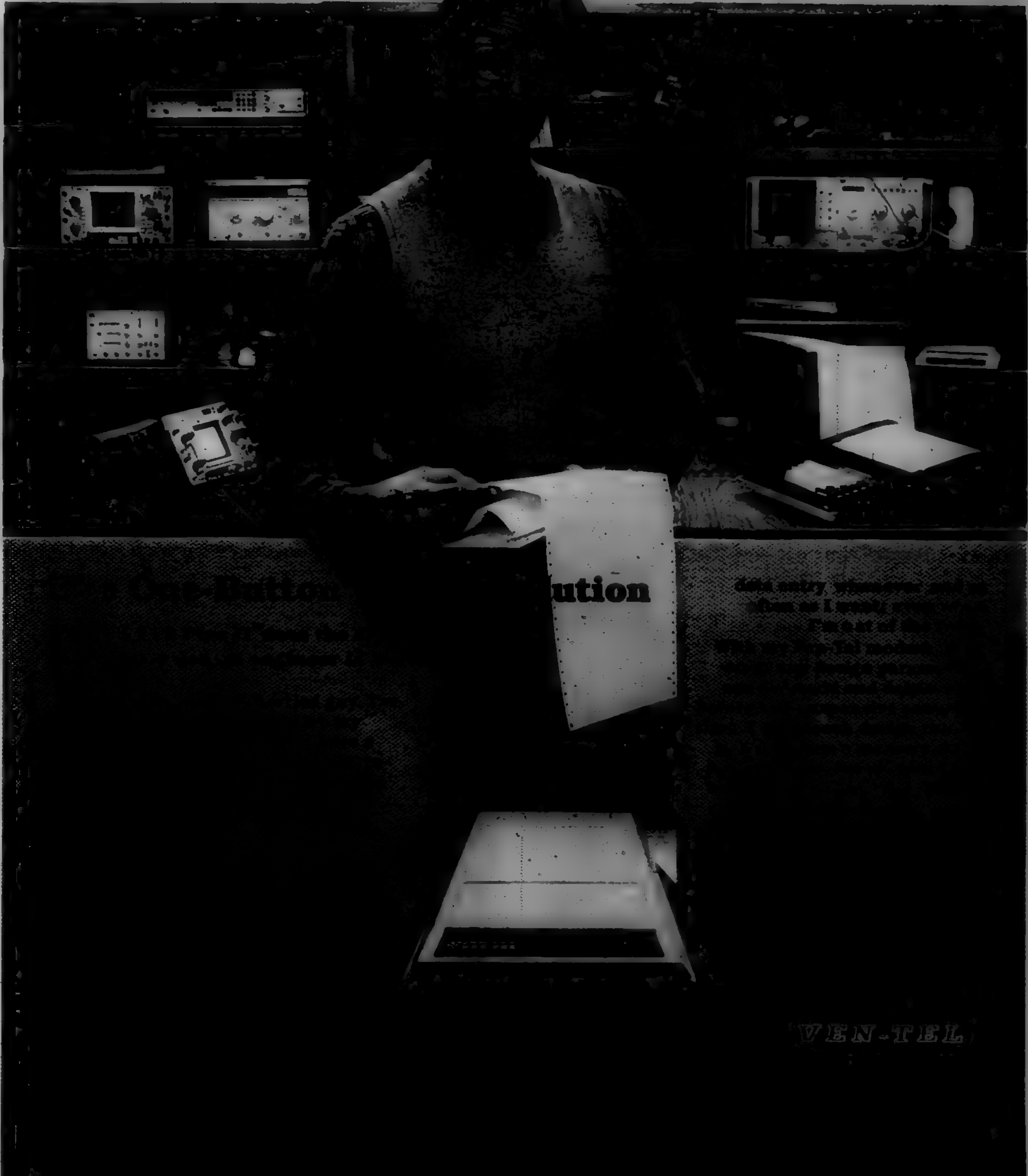

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data entry whenever and as often as I want, [illegible]

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VEN-TEL

Trucking Firm Makes Tracks With Packet Net

ST. CLOUD, Mich. — Anderson Trucking Co. replaced its leased telephone lines with a satellite-based packet switching network and, consequently, doubled the number of remote sites it has on-line and the size of the geographical area it covers while minimizing cost increases.

At its headquarters here, Anderson has a 4.5M-byte Burroughs Corp. B 5900 host mainframe running MCP. The computer has more than 1G byte of disk storage and eight data communications lines.

On-line to it are 55 CRT terminals at 11 sites throughout the country. The terminals emulate Burroughs TD 830 protocol, and DP manager Leroy Justin estimates Anderson transmits between 20 million and 30 million characters a month.

"Like most trucking companies," Justin said, "we use our data communications system for inventory and control. That means keeping track of not only where every driver, piece of equipment and potential load is at any given moment, but what they're all doing. With oversized loads, you also have data about every bridge, every turning radius and every grade along the length of the route."

Customer Calls

When a customer who has a shipment in progress calls the Anderson branch office in Spokane, Wash., an operator at a terminal there can punch in that customer's code and find out when the shipment left its point of origin, when the driver last reported in, whether there was any difficulty or delay and the estimated time of arrival.

If a call comes in from a potential customer, the person at the terminal can call Anderson's billing department in St. Cloud for a rate quote.

The operator can also tell the prospective customer how soon his load can be moved, how long it will probably take and what special permits will be involved. He can also find out which drivers and equipment are available to move it, since oversized or highly valuable loads often require experienced drivers.

Alternatives Sought

Until September 1981, Anderson was paying about $2,500/mo to have five remote sites in three states on-line to its host mainframe in St. Cloud. When AT&T rate hikes threatened to double that $2,500 figure, Justin started looking for alternative methods.

"Just about the time we had started to look around," Justin said, "[RCA Cylix Communications Network, Inc.] contacted us. They were in the process of doing some target marketing into the transportation industry. Their figures looked good, but at first we were skeptical. I guess our attitude was 'Show us.'

"They suggested we use the network on a limited trial basis, and we did, starting with one or two drops for a couple of months and then adding one a month. The trial gave us the chance to see how satellite links would work, and they worked so well that within a few months we'd signed onto the network."

Since Anderson switched to RCA Cylix service, the company has increased its number of "drops," or remote sites on-line to the mainframe, from five to 11 and the number of states in which they are located from three to seven. Its monthly bill is still about $4,000. Justin said he would be paying more than $5,000 for leased

(Continued on SR/34)

Volunteers Track Race With Computer Devices Terminals

Score Major Regatta

Terminals at Helm in Race

BOSTON — A software system used in conjunction with portable terminals cut from hours to minutes the time required to process and track nearly 3,000 rowers in over 700 boats at last year's Head of the Charles Regatta, the Grand Prix of rowing events held each year on the waterway between Boston and Cambridge, Mass.

The software programs, which served as the timing mechanism for the largest single-day rowing event in the world, were written by two members of the Regatta Committee who make their living in the high-technology field.

Charles E. Roth owns Industrial Computation, Inc. and Lawrence G. Copley heads his own communications and data processing consulting firm.

Their efforts on behalf of the Head of the Charles were voluntary, since the race continues to be a nonprofit event run by members of the Cambridge Boat Club. Roth and Copley's system allowed the race's coordinators to time automatically the boats' speeds, to enter and compute easily penalty points and almost instantaneously to call up results.

Donated Terminals

Computer Devices, Inc. of Burlington, Mass., donated the terminals that were located throughout the race site. They provided access to the timing and results system, which ran on NDC/Rapidata Corp.'s time-sharing computer in Braintree, Mass. Equipped with built-in acoustic couplers with modems, Computer Devices terminals can transmit data at speeds up to 1,200 bit/sec. This feature and the portability and reliability of the terminals were factors in choosing Computer Devices equipment, according to Dan Healey, who coordinated the timing teams this year.

Healey explained that at the beginning of each of the Regatta's 18 events, the 40 participating boats (referred to as "shells") arranged themselves in numerical order in the Charles River Basin, downstream from the Boston University Bridge. At the direction of the official starter, the shells proceeded, one by one, to cross the starting line at approximately 15-second intervals.

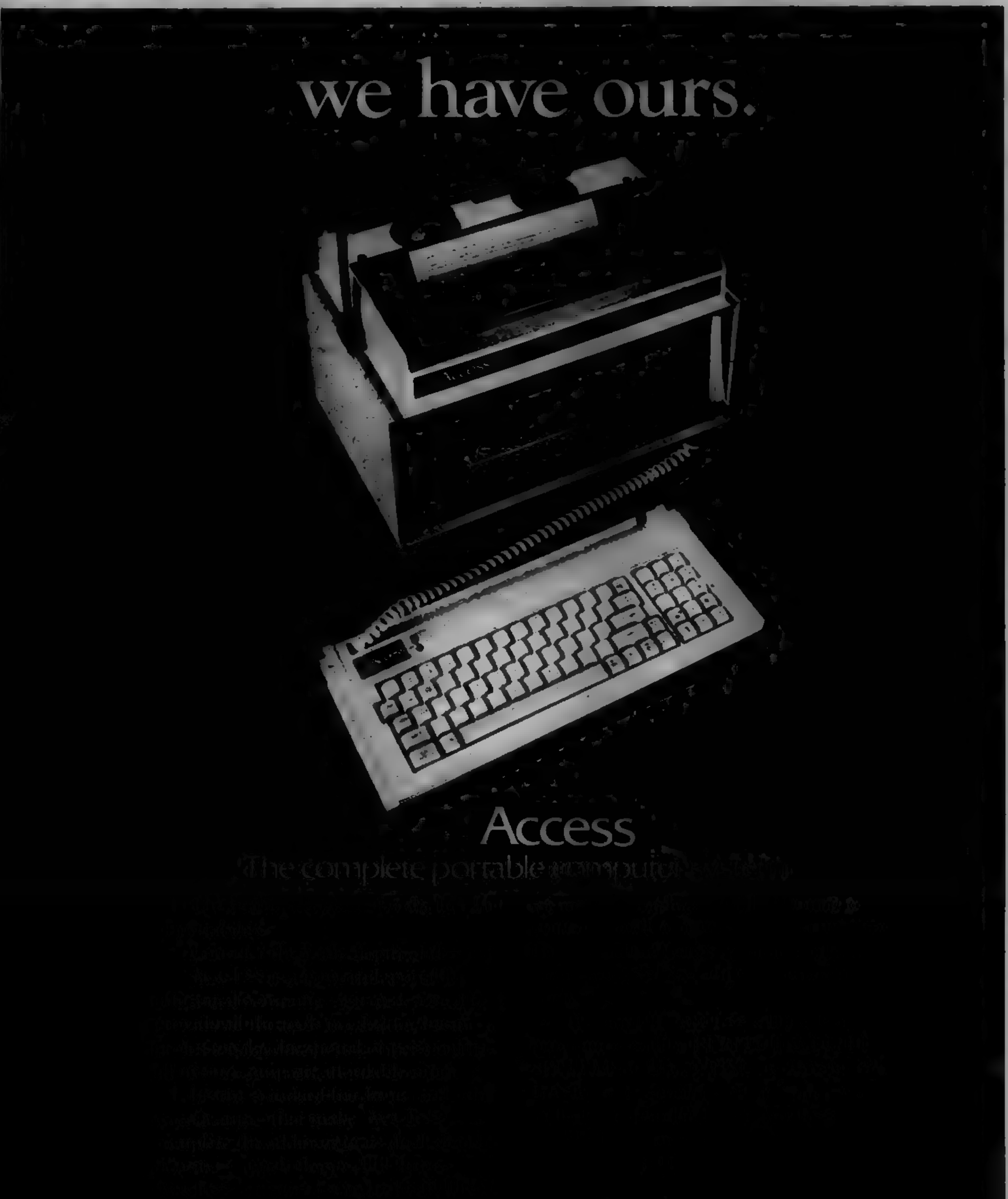
As the boats' bows crossed the start line, their official entry time was recorded in the system by a simple keystroke on a portable terminal.

Times Noted

The computer noted the time and the shells proceeded from a running start three miles upstream to where other Computer Devices terminals were waiting to register their finish.

"Once all of the 40 shells had completed the event, the starting times were automatically subtracted from the finishing times and the results

(Continued on SR/34)



Trucking Firm Delivers With Packet Network

(Continued from SR/32)

telephone lines.

In addition, Anderson is spared the problems associated with managing its own network, since RCA Cylix assumes end-to-end responsibility for operations.

That end-to-end service includes protocol conversion where necessary, data concentration, diagnostics and error recovery and dealing with all the regional telephone companies involved. In short, it includes everything but Anderson's own terminals and mainframe.

RCA Cylix is a "value-added" data communications network that serves users with medium- to high-volume data communications requirements. (The network was just recently acquired by RCA Communications, Inc.)

With users always on-line via a permanent virtual circuit, RCA Cylix transmits data only, not voice or video, and offers an alternative to both low-speed, dial-up networks and very high-speed, high-volume voice/video networks.

There are currently about 130 contracted RCA Cylix users across the U.S.

The network's hub is in Memphis, Tenn., where a specially constructed earthquake- and tornado-resistant bunker houses the supervisory system (two Digital Equipment Corp. VAX-11/780s and two 11/70s) and message switching system. The roof of the bunker serves as a mounting pad for twin, 10-meter dish antennae, one pointing at the primary satellite and the other pointed at a backup satellite.

At each of RCA Cylix's 30 remote earth stations are two 4.6-meter antennae, multiple microprocessors that serve as a communications processing node and satellite communications equipment.

There is a 56K bit/sec satellite link between each earth station and the network control center in Memphis. To ensure reliability, every critical piece of equipment in the network has a backup.

Local data distribution is currently handled on 100,000 miles of lines leased from the telephone company: 9,600 bit/sec point-to-point lines and 4,800 bit/sec multipoint lines.

The user's point of connection to the networks is the "very smart" diagnostic modem (VSM) at the RCA Cylix earth station nearest the user's host mainframe.

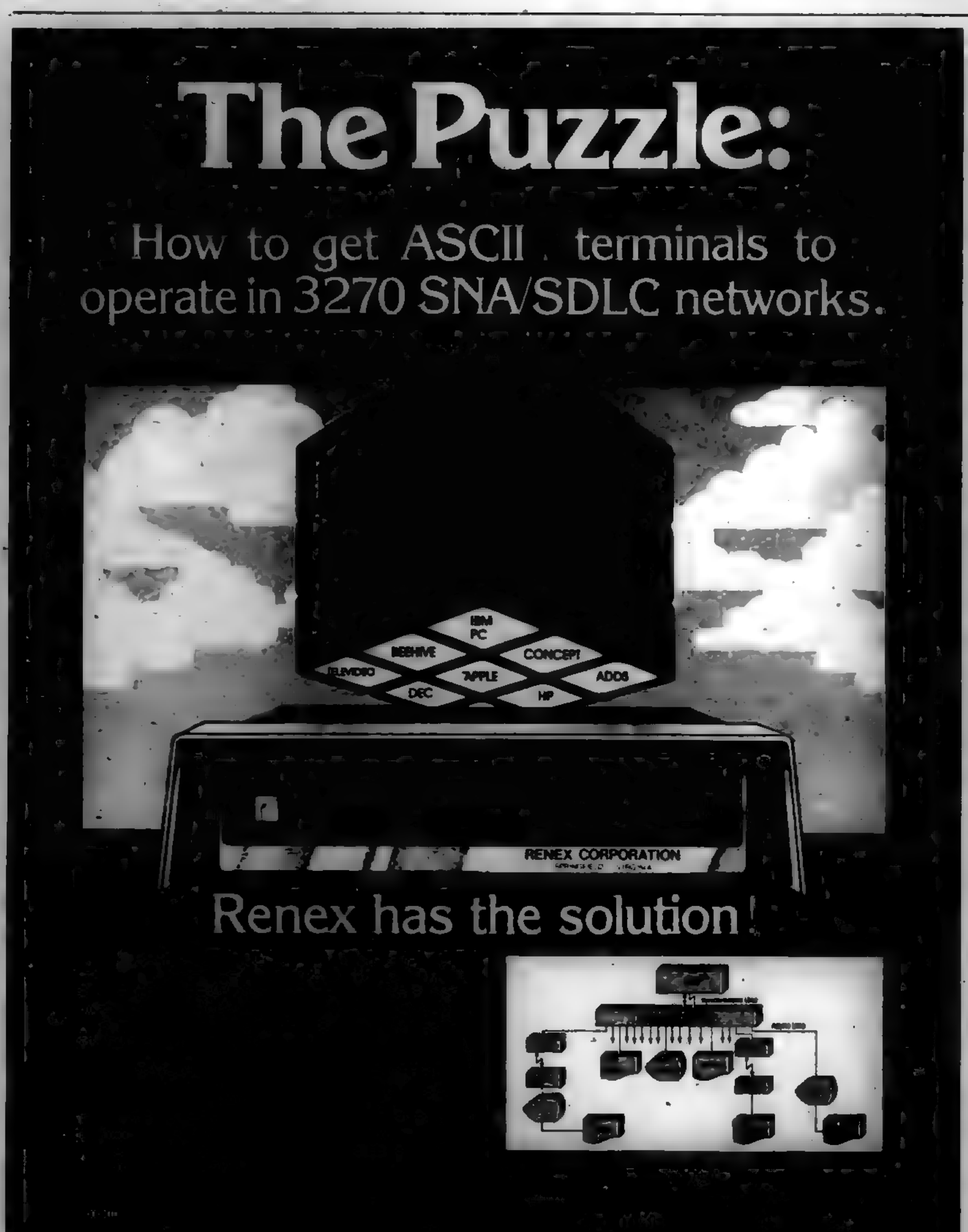
The VSM pinpoints the source of transmission problems and transmits that information via a secondary channel to Memphis, where, if the problem is on a line, an RCA Cylix specialist can call the appropriate regional telephone company to dispatch service.

Currently supported on the RCA Cylix network are Burroughs Poll Select, IBM 3270 Binary Synchronous Communications and IBM 3270 Synchronous Data Link Control.

For Anderson, one of the biggest benefits of using the RCA Cylix network is centralized service.

"Instead of handling problems ourselves," Justin said, "we just call network services at RCA Cylix.

"They know who to deal with at the telephone companies, and they've been both quick and conscientious about analysis and correction of problems. What impresses me about RCA Cylix is their attitude: They go out of their way to be helpful," Justin said.



Terminals Time Major Regatta

(Continued from SR/33)

of each event were computed and printed out on the terminals within approximately 20 seconds," Healey explained.

These results remained unofficial until later in the day when the race's umpires handed in their reports. Positioned along the race site, the umpires watched for and recorded interference disqualifications or buoy violations as the oarsmen navigated the narrow, winding course. The participants were, after all, rowing backwards — upstream — and, in many cases, were without coxswain to help direct them.

The umpire's reports, which often determine the outcome of the event, were entered into the timing and results program at the end of the day's competition.

The computer program translated any violations into time penalties. If a boat cut short a buoy, for example, 10 seconds were added automatically to the boat's time by the computer.

The official results were then computed and printed out on the terminals in a matter of minutes, as compared with the many hours of paper shuffling, checking and rechecking of figures that would have been required without the time-sharing system.

Reduces Cost per Terminal by $120

Realty Firm Moves With Data Carrier System

CHICAGO — JMB Realty of Chicago purchased a data carrier system and reduced its cost per terminal by $120.

Steve Stern, JMB's manager of computer services, explained what led to the need for a data carrier system, "By 1979, the load on our batch-processing [General Automation, Inc.] SPC-16 system was getting out of hand. We had written the software for partnership accounting, general ledger and rental billing, but we were splitting the load into two 50M-byte disk packs, and our ability to respond to inquiries for information was falling behind.

"JMB decided to acquire a [Tandem Computer, Inc.] Nonstop 16 so we could put the information out where people could get it. The first application was general ledger inquiry, but we spent most of the first year, 1979, building our own programming tools," Stern said. "We use an in-house program we call CRTform as a data-entry package for all user functions — it's screen-oriented — and CRTtran; a compiler for building screens and tables," he added.

"We wanted to put data entry and modification in the hands of the people who are responsible for it and take out the intermediaries who have no feel for what reasonable data is. Unfortunately, key-entry people might enter erroneous data because they wouldn't know what the range of figures ought to be," he said.

"What we have now, to give an example, is a check reconciliation system for 500 bank accounts — one for each operating company. We can now pull the issued checks off the general ledgers and put them into check files. We take the tapes that show the cashed paychecks from the banks and our programs compare them with our own records. Those that don't agree, such as a few that are issued but not paid, can be reported out. Then we can modify the general ledger or the check files to show the true state of affairs."

Three Tandem CPUs, with large virtual memories, serve JMB well because, as Stern said, "everything is redundant; no single point of failure will shut the system down. The disk drives are paired, the disk controllers are paired. I can shut off half the disks and the only effect is a slower response time for users."

When the Tandems were introduced in early 1980, there were only a few terminals near the 38th-floor computer room, connected to the processor by direct cables. But as demand for computer services grew, JMB ran into physical limitations. The firm also had offices one floor up. To every office or desk where a terminal was required, they had to run a four-wire cable with big batch panels. That might have worked if the firm had stayed on the 39th floor, but JMB was growing by 10% a year and needed much more room for its 750 employees.

"The time came to move the accounting department to the 19th floor," Stern said, "and I started figuring what it would cost to string cables down 20 floors, each of them 15 feet high. I worked it out to about five miles of cable. That would have been cheaper than bringing in the Teltone Corp. system but the conduits were full.

"The building management just didn't have the space to let us run the cables, and two other factors were at work: Chicago building and fire codes require even low-voltage cables to run through conduits, and the building's own rules insist that journeymen electricians do the work, at about $30 an hour. When we added the labor and conduit costs, it got expensive very quickly. Then we saw a magazine ad for Teltone and called them up."

In early 1981, Teltone set up a six-channel demonstration package of their DCS-2B Data Carrier System. By connecting the terminals through an AT&T Centrex switchboard and splitting the data off the phone lines inside the private automatic branch exchange (PABX) room, the data could be sent by a single cable to the computer room.

With the DCS-2B Data Carrier System, data is transmitted with frequency shift keying, using 36 and 40 KHz to transmit data from the station unit to the termination circuit and 72 and 80 KHz in the reverse direction. Low-pass, passive inductance-capacitance filters are used to isolate the telephone and PABX from the high frequencies used in data traffic, allowing the telephone link to function normally. Full-duplex, asynchronous data at any speed up to 9,600 bit/sec can be carried as far as 5,000 feet on a 26-gauge wire pair for a maximum 17 db loss at 80 KHz.

To get the data to the computer room, one 50-pair cable can haul the data and voice to the computer room where it dumps the data and returns to the PABX with the voice. The cost is usually very low because the wiring is already in place.

At JMB, 64 Digital Equipment Corp. VT-100 terminals are used for data inquiry, entry and retrieval, and they run at the full 9,600 bit/sec. "In this company, even top executives use a terminal," said Saul Newman, JMB vice-president. "The alternatives were separate phone lines and modems, our own cables and short-

(Continued on SR/36)

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Few Networks Aimed at Small Business User

By Bob Buchanan
Special to CW‡

The advent of local-area networks promises the microcomputer user a significant potential for expanding system capacity to meet increased processing demand or for sharing information among a larger user community. However, of the many local-area networks that have been announced, few can effectively support the small-business user.

Most do not provide the "turnkey solution orientation" required by the nonprogrammer businessman, while others are not price-performance competitive against 8- and 16-bit multiuser systems. However, the networks that can meet these requirements will constitute the next generation of multiuser, small-business systems because of their significant advantages over single-processor, multiuser systems.

Networked microcomputers offer increased performance, reliability and flexibility over single-processor, multiuser systems. A single-processor system suffers from the same degradation problems that plague multiuser minicomputers and mainframes. As more users are added, each user receives a decreasing proportion of the system's capacity. This is one major reason why disgruntled users of these larger systems initially sought out single-user microprocessor systems.

Once the systems throughput degrades to an unacceptable level, growth can only be achieved through the installation of additional systems. Data-sharing and application-distribution problems across these stand-alone machines, as well as a significant incremental cost for the new system, are problems the user faces with this alternative. In effect, the same problems indicative of larger systems have been propagated down to the microcomputer, thereby nullifying many of the microcomputer's advantages.

With a network approach, each workstation retains dedicated processing capability. The performance per user remains relatively constant and is essentially independent of the number of users on the network. Networking also provides improved reliability, since the system does not depend on a central processor.

Therefore, the failure of any single workstation or server is not catastrophic. Processing can still continue, in a degraded mode perhaps, while the downed hardware or software is repaired. Carry-in or even on-site maintenance service may take several days through a dealer. On a single-processor system, this downtime could severely impact the business operation.

Increased performance and reliability of data-file backup and recovery are also achieved through networking. File maintenance on data servers may be accomplished while the remainder of the network continues uninterrupted.

For local-area networks to be employed successively in the small-business computer environment, they must provide "turnkey" functionality, ease of use and cost-effectiveness.

Turnkey functionality means that the basic applications running on the businessman's single-user system, such as word processing, accounting, and order entry, must be fully implemented in the multiuser network. The key process here involving the interaction between the data (stored on data servers) and applications (running at the workstations) is not adequately addressed by most network offerings.

Required features include:

- Concurrent file sharing for both inquiry and updates, such as between order entry and inventory programs.
- Automatic application downloading to workstations.
- Security/access controls.

Providing these features requires integration between the network software and the application programs.

Ease of use is achieved through the integration of many features. Since many business users start with a single-user system and expand to meet increased needs, the multiuser interface should look much like the single-user system. Businessmen do not want to be bothered with relearning how to run their applications, defining path names to files or selecting applications from appropriate data servers. To be successful, the

(Continued on SR/38)

Realtor Moves With System

(Continued from SR/35)

haul modems or the Teltone system. We went with Teltone. When the system is fully installed with 96 terminals, our cost will be about $50,000 — about $500 a channel. Teltone has already reduced our cost per terminal by about $120, incidentally, because we don't have to buy the current-loop boards for the VT-100s, which are very fragile."

JMB no longer has to maintain a network of cables either. "The work is not ours," Newman said, "it's the phone company's."

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An Unorthodox Solution

Lumber Firm Ties CRT, POS Terminals to CPU

BURNABY, B.C. — Normally having both CRT and point-of-sale (POS) terminals on-line to the same mainframe requires two networks. This is because the average CRT controller and the average POS controller do not coexist very well on the same telephone line. Orthodox solutions to this problem usually call for the signals to be multiplexed forming two logical lines from one physical one.

As part of a long-range business plan, the data processing services of Lumberland Building Materials Ltd. are being expanded to include a network of both CRT terminals and POS terminals. The head office has installed an IBM 4331 with 3M bytes of memory and 1,557M bytes of disk. Running under VM/DOS/VSE with CICS/DL1, the processor is intended to support a network of 80 POS terminals and CRT terminals by the end of 1983.

The majority of these terminals will be remotes, operating through leased telephone lines. This remote network is just entering the installation phase.

The objective of the remote network is to provide on-line CRT and POS terminals at each of the retailer's 11 home-improvement centers. The CRT terminals will provide information on the assortment of goods carried, purchase order writing, receiving of goods, inventory functions and management summaries.

The POS terminals will provide record of sale for individual items, returns by individual items, credit account payments and credit sales for both Lumberland's credit system and for bank cards such as Visa and Master Card, a spokesman from Lumberland said.

The credit processing is designed to verify that the card presented is valid. Given that it is a valid card, credit approval or refusal will be given to the cashier. For the bank cards, this involves direct contact with the bank's computer first and then returning the bank's answer to the cashier.

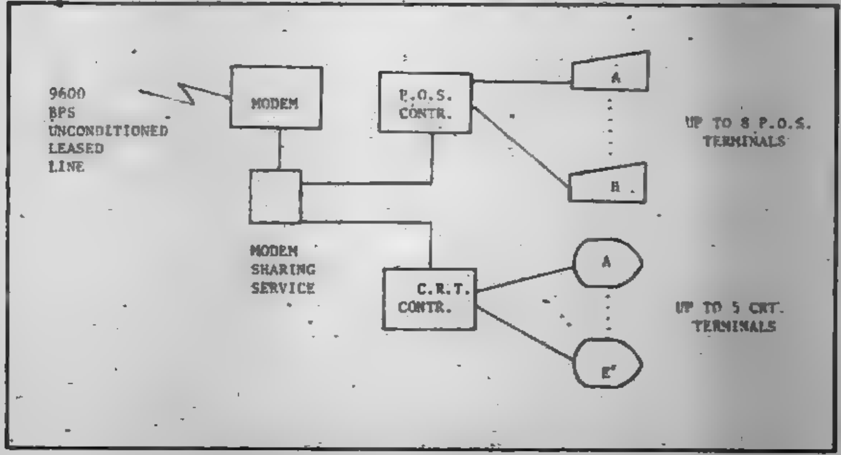
The objective is to return an answer within 30 seconds. This is a vast improvement over the current method. Now, customers wait five mintutes when telephone approvals are required during busy periods, a company spokesman said.

For Lumberland, the options of having two physical networks or multiplexing were both unattractive. Two physical networks would have cost an additional $25,000 a year for just the lines — with modems, $30,000 per year.

During the design, Lumberland was aided by technical personnel from the local telephone company, British Columbia Telephone. Using its model, the firm examined several network alternatives. Response times at various line speeds, numbers of terminals per line and network protocols were estimated.

This modeling indicated that the

(Continued on SR/38)



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Lumber Firm Links CRT, POS Terminals in Net

(Continued from SR/37)

principal component of response time was line speed. The number of terminals per line was the secondary factor. At three terminal/line and 4,800 bit/sec the expected average response time was seven seconds. This degraded to 14 seconds or more at least 5% of the time. At 9,600 bit/sec, the average was 3.5 seconds and the 95th percentile was seven seconds.

Factors other than line speed and number of terminals were modeled in these simulations. Other factors included the proportion of 3,000 character messages to other message lengths in the traffic pattern; assumed processing delay in the CPU; modem turnaround time; the overhead of the network protocols chosen; and the delays in the telephone network itself, the spokesman said.

Faced with users who requested 5-sec, worst-case response time, a 14.2K bit/sec line speed was considered. However, when relative equipment costs were explained to the users, a compromise of 9,600 bit/sec was reached. A compromising factor was that on some local lines, 14.2K bit/sec throughput was impossible to obtain consistently. In other words, the relative speed improvement would not be in proportion to the costs, the spokesman said.

Given the simulations, the company concluded that the CRTs required all the line speed they could get. Therefore, the option of reducing the line speed available to the CRTs by multiplexing the POS signals over the same line was very unattractive, the spokesman said.

The solution chosen was to select a protocol that allowed the CRT controller to seize the entire available bandwidth of the line. By operating in a polling mode, the chosen protocol dedicates the line to one controller at a time. The POS messages are so short at 9,600 bit/sec that they have no real effect on the CRT's perceived response time.

The protocol chosen was IBM's Synchronous Data Link Control/Systems Network Architecture (SDLC/SNA). SDLC/SNA will operate in a multidrop polled environment and it is compatible with the head office computer, the spokesman said. The company, therefore, specified that all

(Continued on SR/40)

Turnkey Best Solution for Small Business

(Continued from SR/36)

network software must handle these system management functions by making the networking of data and applications transparent to the user.

Cost-effectiveness is a measure of the system's performance per dollar spent by the user.

While the multiuser systems contain 15M bytes or more of disk storage bundled into the above price, the networked systems often have to amortize expensive shared-disk systems over the number of attached users. This may easily increase the cost per user by over $1,000 on small-business systems. If the data server can be incorporated into a workstation, better cost amortization results. This way, costs may be held to only a few hundred dollars per user.

Therefore, a primary question remains: Does a local-area network exist today that provides the features required for the small-business systems user?

Two types of baseband networks have been introduced: multivendor interconnect networks and single-vendor proprietary networks.

Multivendor networks allow devices from various manufacturers to be interconnected physically as workstations and data servers. Generally, files and programs can be transmitted between workstations, and users can do electronic messaging across the network. To pull data or programs down to a workstation or to send the same to another workstation generally requires that the user define the path (that is, workstation identifications, directories, file names and so on). This requires knowledge of the network's logical structure. Also, programs running at workstations cannot effectively share data.

A network of this type is valuable if an organization wishes to interconnect an installed base of dissimilar hardware. If network interfaces are provided, it also potentially allows a user to take advantage of hardware breakthroughs by different manufacturers.

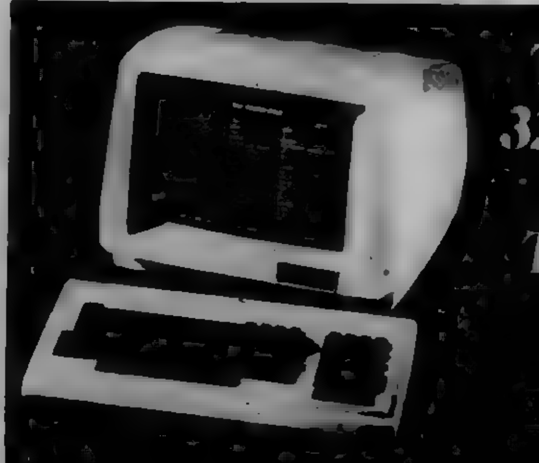
Single-vendor networks require that all devices on the network be from the same vendor. This allows for fully integrated software that uses all the best features of the hardware. Gateways that allow external communications from the network to other vendor devices are generally provided.

The main limitation of such a network is that new hardware technology introductions cannot be included unless the network vendor provides a similar device.

One example of a recently announced local-area network directly targeted at the small-business user is North Star Computers, Inc.'s Northnet. The physical aspects of the network include a shielded, twisted-pair cable bus architecture.

Compared with single-processor, multiuser systems or the multivendor network system, the single-vendor network approach provides a better means of supporting the growing small-business systems environment. The multiuser systems of the '70s answered pressing needs for small businesses to have multiple users sharing the same data, but the user paid a price in reduced performance and reliability.

Buchanan is manager of software product marketing for North Star Computers, Inc., San Leandro, Calif.



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National Group Ties State Offices via DDP Net

WASHINGTON, D.C. — The National Education Association (NEA) has installed a new distributed data processing (DDP) network, tying its state offices in an interactive, on-line web that could potentially reduce NEA network operating costs by an estimated $100,000 in monthly telecommunications charges.

The network is based on Nixdorf Computer Co.'s 8860 series.

Michael G. Putro, NEA's director of data processing, briefly outlined the selection problems facing NEA and the final solution: "We needed a network of computers that wouldn't force special operator training, yet would feature interactive, remote job entry (RJE) and DDP capabilities. The 8860, which supports IBM's System Network Architecture [SNA] for data processing tasks, lets us simultaneously run different remote devices like terminals, printers and on-site 8860's on the same data communications link.

Putro continued, "With this network, we now can handle batch entry and interactive processing jobs from many remote sites. When I extrapolate the dollar savings gained just from reduced telecommunications costs on our current 15-system configuration to the 50-state hookup planned by September 1983, we should save $100,000 each month. Intangibles like reduced operator training costs only add to savings and efficiency."

The NEA is the world's largest educational group, founded in 1857 to elevate the character and advance the profession of teaching and to promote the cause of popular education in the U.S.

Primarily comprised of elementary and secondary school teachers, the NEA exercises a strong voice in local community affairs through the Parent-Teacher Association and directs student/teacher communication. The group claims a membership of 1.7 million.

The very structure of NEA — with headquarters in Washington, D.C., affiliates in each of the 50 states, Puerto Rico and Europe and 12,000 local offices within the states — makes information management an enormous task. To compound the challenge, each remote site functions autonomously. Putro said,"We've literally got 50 states doing things 50 different ways. The same thing goes for our locals. Our function here at headquarters is basically to serve as a service bureau to the states, providing all DP and communications support."

In 1980, only the Atlanta and Denver regional data processing centers existed, primarily to process membership information. With NEA enrollment growing, Putro's task was to replace existing RJE equipment and open two new regional DP centers.

"From a price/performance standpoint, and because of overall system capabilities, I chose Nixdorf 600/45 systems for each site," Putro explained. "This hardware fulfilled nearly all of our data entry and [remote job entry] needs and also functioned as a very powerful processor." Each of the four regional systems is configured with eight key stations and a printer.

However, state affiliates still batch all business, mailing it to the regional centers for processing. Data was then keyed into data entry terminals and transmitted to Washington. The headquarters center generated reports, burst and decollated them and mailed the finished work to each state.

"This process took three, five or sometimes as long as 10 days, depending on timing and office locations," Putro said. "That's far from satisfactory when it comes to quickly processing vouchers, reimbursements for utilities and other accounts payable and general-ledger-related activities."

Putro believes he could have placed "dumb" RJE terminals at each state office, "but that would have required operating in an IBM 3790 Binary Synchronous Communications point-to-point mode for batch in addition to the existing multipoint bisynchronous 3270 network for interactive mode. The cost of running the required data communications lines would have been prohibitive."

Therefore, NEA conducted a market survey of products from several major systems manufacturers, including IBM, Harris Corp., Four Phase Computer Systems, Inc., Datapoint Corp. and Nixdorf. "IBM was having problems with their 8100, in terms of installation complexity, dif-

(Continued on SR/40)

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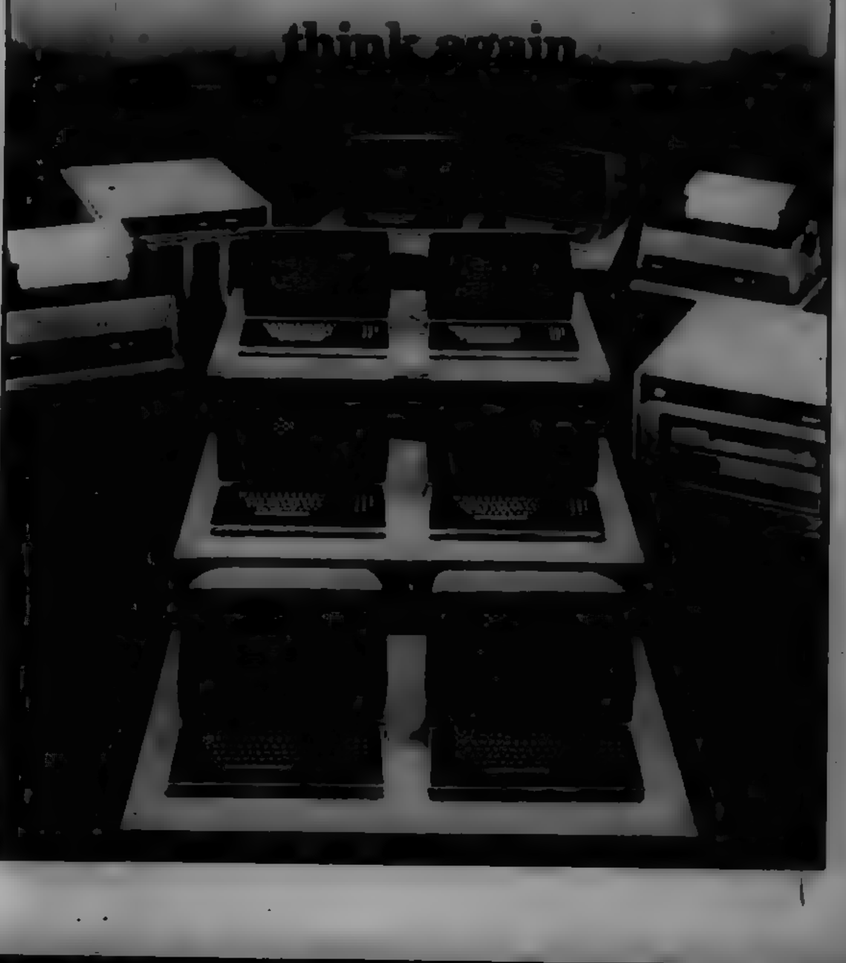

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Group Links State Offices With DDP Net

(Continued from SR/39)

ficult operation and expensive support," Putro recalled.

"And all other vendors except Nixdorf claimed their equipment could operate in either 3270 or [RJE] mode," he said. "However, Nixdorf's 8860 with SNA could function concurrently in both modes, a feature which not only resolved the problem of merging batch and on-line capabilities in a single terminal unit, but also enabled us to utilize a wide range of anticipated data processing functions."

Putro said the Nixdorf equipment was fully compatible with the NEA's IBM mainframe, could also communicate intelligently with other 8860's and featured easy operation and modular expandability "so we could economically customize systems to suit the work volume from each state location.

"Concurrency, though, was the operating feature that triggered our final choice, because as we added systems to the overall network, we wanted to save data communications line costs," Putro said.

In autumn 1981, six 8860 Model 10 systems had been installed — one in Washington, D.C., headquarters and five pilots in state locations. By August 1982, 12 states handled all data processing with their 8860 systems.

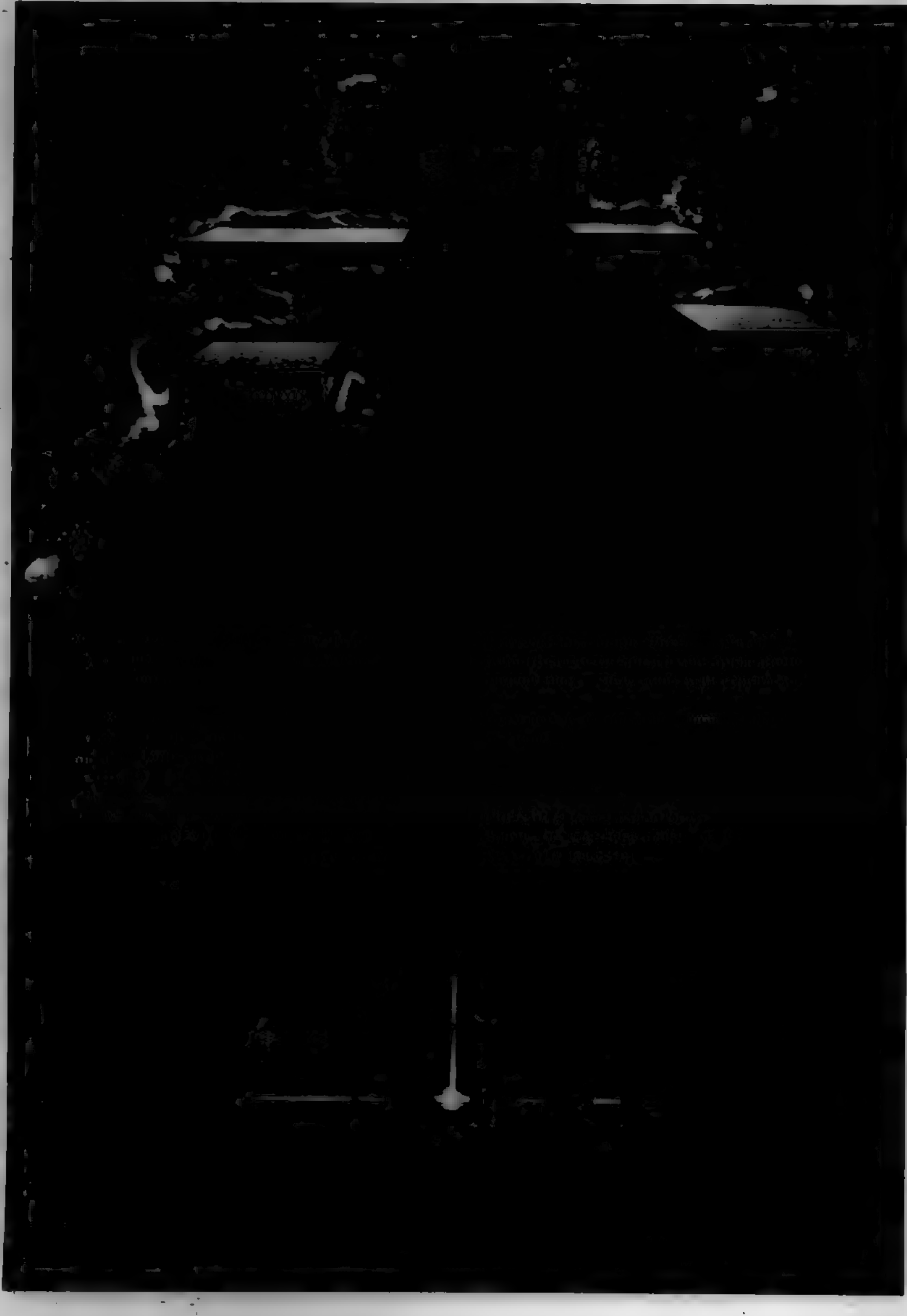
Four additional installations are scheduled for the near future. The specific system configurations vary with the size of each site, but each state office has between three and eight terminals and either a 300 or 600 line/min printer installed.

The CPU has 512K bytes of memory, a fixed/removable disk drive, a diskette drive and four communications channels. Each 8860 system can be upgraded in the field with up to two magnetic tape drives, 12 additional communications channels and a maximum of 24 workstations and four disk drives.

These systems communicate with twin 8M-byte IBM 4341 Group 2 mainframes at Washington headquarters, which also houses the entire NEA data base on an array of 52 Model 3350-compatible disk drives.

The next system network evolution is at the local level. "We are now considering ways to enlarge our locals," Putro said. "One option is to provide them with either remote workstations or personal microcomputers. In this way they can tie into our 8860s at the state level and then on to the NEA mainframe hosts.

"This is precisely why we went with Nixdorf's SNA. It not only reduces line costs, but it is the common bond of future communications protocols. It has been accepted as a de facto industry standard," he said.



Terminals Tied To Network

(Continued from SR/38)

remote terminal systems must be able to operate in such an environment.

Given the effects of adding terminals to a line, the preference was to run one line to each store. The costs of doing this were acceptable, and it was still cheaper than running two physical multidrop networks. However, a restriction on the communications capabilities of the Lumberland's head office's 4331 arose here, according to the spokesman.

Integrated Adaptor

The 4331 handles telecommunications lines through an integrated communications adapter (ICA). An IBM 3705 is an option, but costs about $3,000/mo on rental. The ICA has an aggregate input limit of 64K bit/sec. This is the configuration limit, not an instantaneous throughput limit, the spokesman said.

Eleven stores multiplied by 9,600 bit/sec requires a configuration of 105K bit/sec. The alternatives were to install a 3705 or put several stores on one line.

To decide, Lumberland returned to projected traffic volumes and response time simulations. These showed that three smaller stores together had about the same projected traffic volume as the largest store. Theoretically, placing them on one line should give them the same response as given to Lumberland's largest store.

The final network then became an ICA running seven lines configured as follows: four individual lines running at 9,600 bit/sec; one 9,600 bit/sec line shared between two stores; one 9,600 bit/sec to make up the 64K bit/sec capacity.

At each store, a CRT controller and a POS controller shared the modem and the line. (See Figure on SR/37). First, the functional and performance goals of the network were established. Then through a series of refinement steps, the costs were reduced and the technical problems resolved.

Planning Yields Geisco Cost-Effective Network

By Daniel Casco,
Dr. David Castiel
And John-Francis Mergen
Special to CW‡

ROCKVILLE, Md. — As a result of the dynamic nature of their environment, telecommunications and DP managers are constantly faced with a broad array of possible alternatives for meeting their data communications needs. Conventional networking strategies based on leased, public dial and Wats lines are increasingly challenged by newer alternatives, such as value-added networks, satellite networks and dial services offered by other common carriers.

Planning needs have gone beyond the "back of the envelope" tool used to deploy many early data networks. Data communications systems have become critical to the operation of many businesses.

The selection of the proper communications strategy for a given networking requirement is complicated by the need to evaluate systems that employ a mix of data carriers, along with the trade-offs between cost and performance levels considered in the configuration of a network. This evaluation process serves as the basis for the selection of the most viable, cost-effective networking strategy.

General Electric Information Services Co. (Geisco) has faced the problems and opportunities described above in the process of supporting its worldwide telecommunications network. As the alternatives have proliferated, the requirement for the development of sophisticated modeling techniques to pinpoint the best solution has grown.

The techniques developed for internal use at Geisco can be used to examine and select systematically the most appropriate mix of communications services available to the telecommunications and DP managers, without the cost associated with designing and analyzing all possible implementations.

These techniques have been integrated into a Network Modeling System (NMS) by the Delivery Systems Department at Geisco. NMS allows the analyst to specify various network requirements, vendor tariffs and design parameters; to configure and optimize networks for AT&T leased line, Wats and direct distance dialing offerings and for selected value-added networks offerings; and to describe the optimized line and equipment configurations and their costs and detail or summary reports.

Outstanding features of NMS include the ability to configure networks with multipoint lines, multipoint lines with concentration, Wats/Foreign Exchange dial access, value-added networks with dial and/or private access for both terminal and host equipment and value-added networks access with concentration.

These services can be modeled at varying performance levels. The model runs on Geisco's Mark III remote computing service in an interactive or batch mode. In addition, NMS has been tested on a 700 network application, but it was designed to handle up to 2,000 network locations.

Using the NMS described above, Geisco is seeking to develop general guidelines to accelerate the isolation of the proper communications mix for various classes of networking applications.

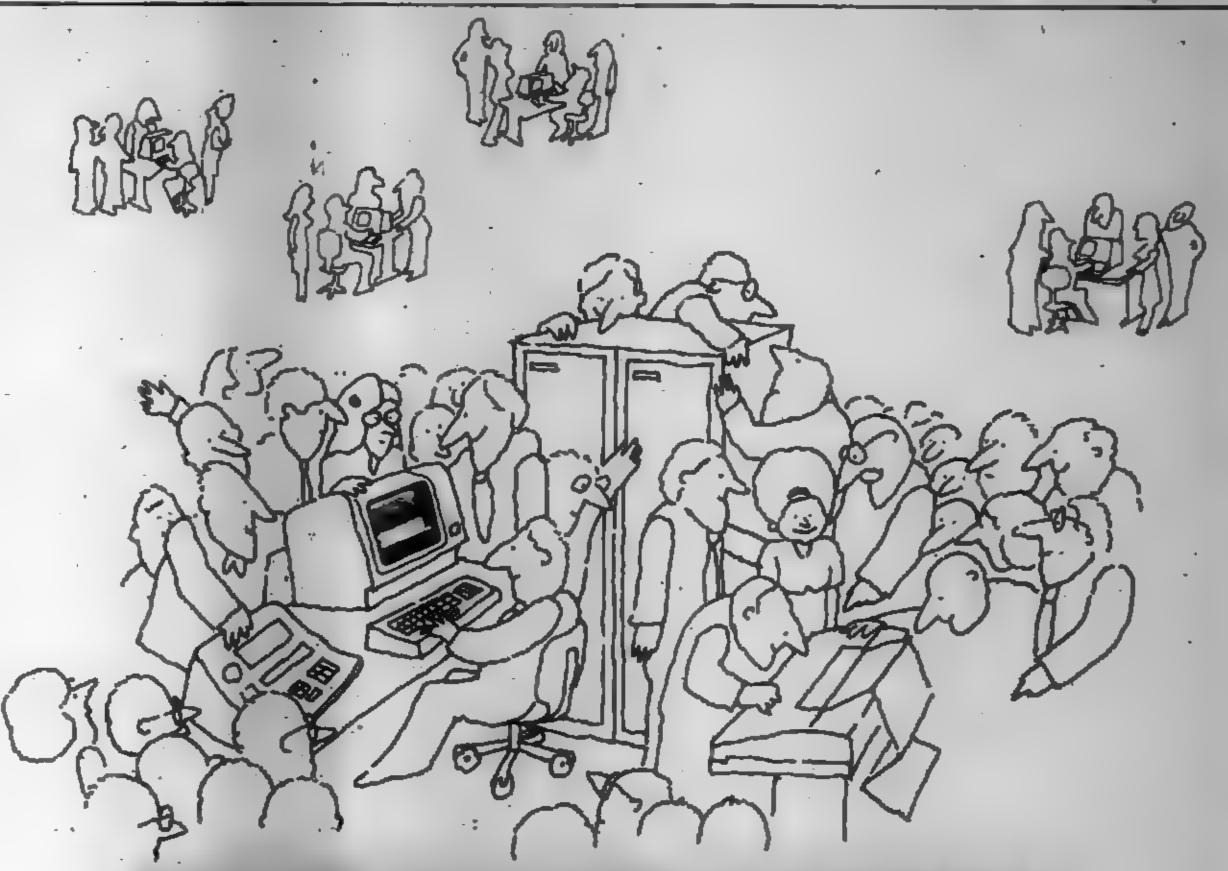
A three-step procedure has been selected to obtain these guidelines:

- A set of characteristic network user scenarios was gathered. These user scenarios represented the traffic and coverage requirements of various classes of network applications. Typical networking applications include a variety of applications, such as corporate data network services, credit authorization systems, order entry and inventory control systems. In addition, various banking, credit, insurance, manufacturing, public utility and computer service applications were profiled in the set of user scenarios.
- The network modeling system was used to configure and optimize networks for different vendors and offerings.
- The results of the modeling exercise were analyzed to obtain the impact of vendor pricing levels, deployment patterns, service levels and service offerings for classes of networking applications.

The results from the analysis have shown that some general rules do exist for the identification of customers best served by value-added networks, direct distance dialing and Wats. There appears to be an area in which value-added networks have a clear advantage over all other data communications alternatives.

This area is bracketed on one side by Wats and direct distance dialing implementations and multischedule private-line structures on the other side. One of the key factors affecting the selection of value-added net

(Continued on SR/44).



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IBM System/34 User Goes Remote for Less

SCHAUMBURG, Ill. — How does an IBM System/34 user lower remote processing costs and expand telecommunications capabilities at the same time?

That was the question facing Omron Electronics, Inc. two years ago, when it wanted to provide greater remote processing activity for sales and service, while adding more remote on-line workstations.

Omron, a subsidiary of Omron Tateisi Electronics Co. of Japan, has been marketing and distributing electronic products and systems in the U.S. for nine years. The subsidiary started in the U.S. in 1973 with one employee and now comprises two divisions in the U.S. and Canada: Control Components and Retail Systems.

Its quick growth "has brought about some predictable and yet some unique organizational concerns," explained Tom McGucken, assistant vice-president of finance and administration.

"Other than the ability to handle our pure volume of activity, the System/34 is a very good computer," McGucken said.

"We've been fortunate enough to have developed good software. Consequently, the only drawback, as we perceived it in our operation, was the systems communications capability," he addded.

Major DP Operations

Omron's major DP operations are order entry, inventory control, distribution, billing, accounts payable/receivable and general ledger. About 25% is done in batch mode and the rest is interactive.

In January 1980, the firm installed its first System/34 and then doubled its computing power by adding another system in November of that year. With two System/34s supporting over 30 5251 workstations and tabletop printers, one system printer and an IBM 6670 Information Distributor, Omron faced yet another challenge in improving its system's capabilities.

With one System/34 used primarily for word processing and development, how could the firm expand the communications capability of the second System/34 to provide greater remote processing activity for sales and service while adding more remote on-line workstations?

Omron had two available communications lines for

(Continued on SR/44)

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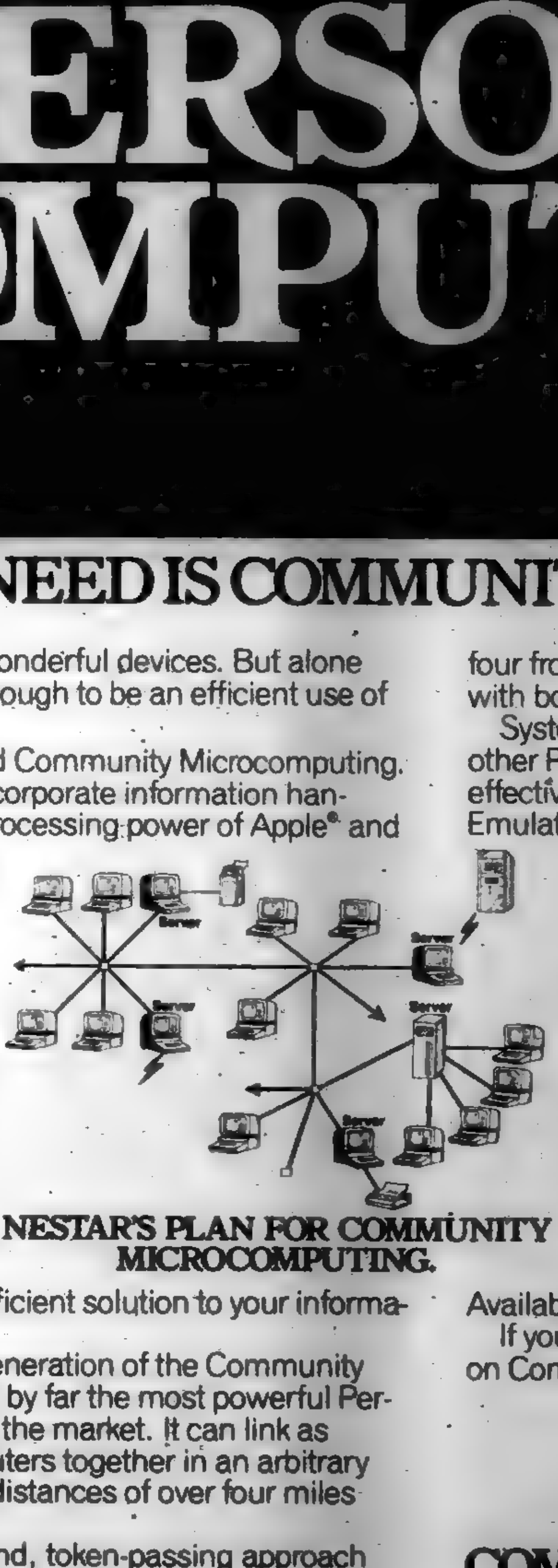

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System/34 User Saves While Going Remote

(Continued from SR/42)

five regional offices to share. Regional offices are located in Canada, Massachusetts, Georgia and two in California. "It was an unworkable situation because no one could ever get through," McGucken said. With the two divisions wanting more autonomy for their regional offices to enter orders, they had to look at how they were going to get more lines into the System/34.

At that point, of the four available communications lines on the System/34, one was connected to the 6670, another direct line was connected to its local warehouse and the remaining two serviced its five regional offices.

Two basic alternatives were considered: to replace the two System/34s with a System/38, which has eight communications lines available; or to order a Series/1 with 16 ports to be used as a multiplexer to the System/34.

While the Series/1 alternative was being proposed to Omron's management, however, a third alternative was presented. John Katich of Zink & Katich, Inc. in Lansing, Ill., and Michael Sweeney of Sweeney Computing Corp. in Burr Ridge, Ill., met with McGucken to present their new product.

Access/34 was designed to allow the System/34 user to communicate interactively with low-cost asynchronous devices not directly supported on the System/34 by IBM.

Access/34 carries a $12,000 price tag, as opposed to Series/1's $90,000 price that includes software but not support of 5251 Model 12s.

Further Savings

Omron also decided to move to IBM's Displaywriters, which feature asynchronous and binary synchronous communications communications capabilities and cost about $150/mo less than the 5251 Model 12s. One Access/34 with eight ports was ordered, along with 13 Displaywriters. Eight Displaywriters were to be placed in the office here for word processing. Three weeks later, Digital Research, Inc. announced CP/M for the Displaywriter.

Access/34 reportedly was installed and operational in less than an hour. In a period of five months, Omron had gone from being completely out of remote processing power and not knowing where to turn regarding communications to developing a cost-effective, efficient and versatile network.

Planning Yields Net for Geisco

(Continued from SR/41)

works is the cost of the local distribution system.

The results of the network modeling system have produced a set of attributes for the local distribution needs of selected network applications. These attributes can be used to differentiate among those network applications that will benefit from value-added-networks-based solutions and those that should opt for conventional circuit-switched-based solutions.

Alternative applications of the modeling system address specific technology issues, such as local concentration mechanisms and local distribution mechanisms, including local-area networks, private branch exchange (PBX), microwave and cable networks and their impact on the use of value-added networks.

Preliminary results from this type of analysis indicate that the greater the reduction in the local-loop cost, the further improvement in the regime where value-added networks already enjoy a cost/performance advantage over other systems. This means that users who have installed local-area networks and digital PBXs to increase installation flexibility, reduce cabling cost and improve reliability will also realize cost improvements in the reduction of long-haul data communications costs of using value-added networks due to the reduction in local-distribution costs.

In summary, the lessons learned from continued planning and modeling experience show that:

- Alternative strategies in network planning have increased in number and complexity.
- Network modeling aids in the systematic analysis of these alternatives and reduces the complexity and uncertainty of the selection process.
- The complexity of network planning can be reduced by the association of generic attributes of specific classes of network applications to appropriate communications strategies.
- Evaluation of specific technology issues can be simplified through the use of a comprehensive modeling system.

Casco, Castiel and Mergen are project managers at Geisco, Rockville, Md.

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Software Collects Kudos From Credit Company

DALLAS — In 1897, J.E.R. Chilton Sr. began the business of collecting credit information. He coded and entered data found in the files of prominent Dallas merchants in a small red notebook and later published the first known credit rating guide.

Years later, his company pioneered another new concept in credit reporting — only this time with the help of computer hardware and software.

In 1968, Chilton Corp. successfully automated a credit bureau operation, reportedly one of the first systems to provide on-line access to credit information. It is known as the Credimatic System.

Information Warehouse

Today, Chilton is one of five U.S. companies that provide automated consumer credit reporting services. The company serves as a warehouse for information regarding the paying habits of millions of people.

Chilton originally used an internally developed data base system to manage the credit histories of its subscribers' millions of customers. As the system grew, network and file structures became increasingly burdensome to maintain, a Chilton spokesman said.

This led Chilton to migrate to data communications/data base software from Applied Data Research, Inc. (ADR). Chilton installed ADR's Datacom/DC teleprocessing monitor in 1972.

More recently, Chilton chose ADR's Datacom/DB data base management system. "We wanted something which would simplify maintenance, development and performance considerations," said Ed Frazier, Chilton's director of data processing administration. "Datacom/DB's inverted index was absolutely essential for the rapid data access we needed."

Today, Chilton supports nearly 5,000 terminals on a communications network of over 2,000 telephone lines spanning the country. Chilton averages 1.3 million to 1.6 million transactions daily with one- to two-second response time.

Chilton's service bureaus provide the major source of the company's $50 million in revenues. The quality of data management is reflected in several service areas — data processing for affiliated bureaus, check authorization, collection services and credit reporting, the Chilton spokesman said.

Meeting Customer's Needs

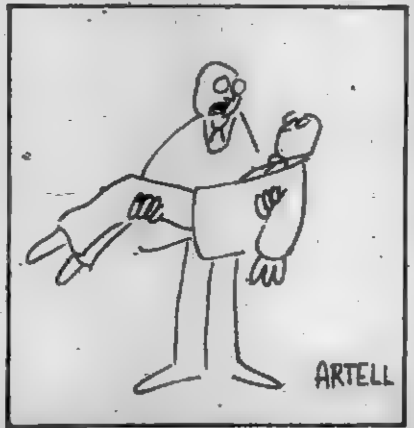
The production and delivery of information services and the development of new services helps Chilton change in response to customer's growing needs — changes made possible through the evolution of computer technology.

Chilton's check authorization system, built around ADR'S Datacom/DB and Datacom/DC, provides up-to-the-minute information on 3.2 million consumer check writers to more than 2,200 subscribing banks and retailers.

Chilton's collection system is a batch-distributed Datacom/DB system with 14 remote job entries supporting regional collection centers. Using Datacom/DC, the host system manages data retrieval of 4.5 million records available on line, the spokesman said.

The system can transfer accounts to a central location in 24 hours, acknowledge the placement of the accounts, generate collection notices and place a collection file in a telephone collector's hands.

To support application development activity, Chilton uses ADR's Datadictionary with on-line update. Don Taylor, Chilton's manager of data base administration, said Datadictionary is the central source for Chilton's documentation and is always current. It is the focal point for the integration of ADR's entire product line.



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Paul Femino, *President, FEMCON, Software consultants to West Lynn Creamery*

"I'm incredibly impressed with the quality and maturity of Stratus's software and hardware."

Michael Feldman, *Vice President, Technology Consulting Corp.*

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Tony Persino, *Software Contractor, Macomb Multiple Listing Service*

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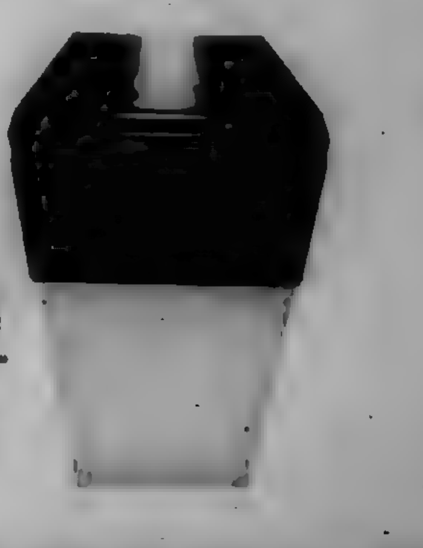

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Bank Counts on ATMs for Franchise Program

LOS ANGELES — With financial institutions competing in an environment of deregulation and technological change, First Interstate Bankcorp has opted for franchising as a way to generate additional income.

The holding company, located here, is comprised of 21 member banks in 11 Western states. The corporation offers a franchise program which will enable nonmember banks to capitalize on the resources and technology of the $40 billion financial institution. Franchising allows each bank to access account data through 6,000 teller terminals and utilize more than 700 automatic teller machines (ATM), according to a bank spokesman.

"Franchising is appealing because it allows us to extend our influence and generate income beyond the 11-state territory without a large capital commitment," according to bank Executive Vice-President Alex Hart. "Bankers who find it increasingly difficult to compete in the emerging competitive environment can succeed through franchising and retain ownership of their banks."

Ranking eighth in assets among U.S. banking companies, First Interstate's 21 banks have 930 domestic offices that serve 476 communities. All branch offices are linked to a large IBM 3081 processor here. Each bank accesses account data directly through one of 6,000 IBM 3604 teller terminals. They also utilize more than 700 ATM's which are linked to the 3081 via 50,000 miles of communications lines. The entire system is known as the Teller Item Processing System (Tips).

With two banks as franchises, First Interstate plans to add as many as 10 banks within the next 18 months. All banks adopt First Interstate's name and logo, participate in a common advertising program and subscribe to a certain number of financial services offered through Tips. In addition, the franchised bank is granted a territorial exclusive, an Interstate spokesman said.

When a new franchise is added, Interstate links its existing hardware to the system or provides them with the new equipment, such as IBM 3604 teller terminals and IBM 3624 ATMs. New customer account data is loaded into the system and the franchisee goes on line with Tips. The bank's customers are issued First Interstate Bankcards, giving them access to cash and bank services throughout the Tips network. Tips now covers the Western states, a spokesman said.

First Interstate has more than 300 full-time programmers dedicated to product development. In support of the Tips network, First Interstate has implemented a comprehensive on-line network control center to perform problem tracking and resolution, a bank spokesman said.

The control center is staffed by 30 full-time technicians and banking application specialists. Since it is cost effective to have many banks utilize a single data processing system, Hart believes the First Interstate will keep ahead of the competition by offering the latest financial services at the lowest cost.

"The future of the financial service industry is on-line," Hart said. "Those who can deliver a product with the highest degree of reliability and the greatest customer appeal at the lowest cost will be most successful."

Remote Units Get Energy Specs To Field Salemen

VALLEY, Neb. — More often than not, the duties of irrigation systems sales extend well into the agricultural hinterlands. So, it is difficult to get quick access to information critical to keeping customers informed and order books filled.

In an effort to give its sales staff and distributors the information they need during sales calls, Valmont Industries, a manufacturer of irrigation systems, developed a computer service designed to provide marketers with precise energy measurement for the company's mechanized irrigation systems.

The Valcom system, installed a year ago, consists of over 100 Texas Instruments, Inc. portable data terminals, through which the sales force can communicate from the road with the company's IBM 4341 at Valmont headquarters here.

According to Bob Ward, manager of market information, the TI Silent 745 terminals enable the sales force to communicate directly with the host to provide the farmer with a detailed analysis of the irrigation system planned, revealing which systems are most energy efficient and, therefore, best suited to the farmer's needs.

(Continued on SR/48)

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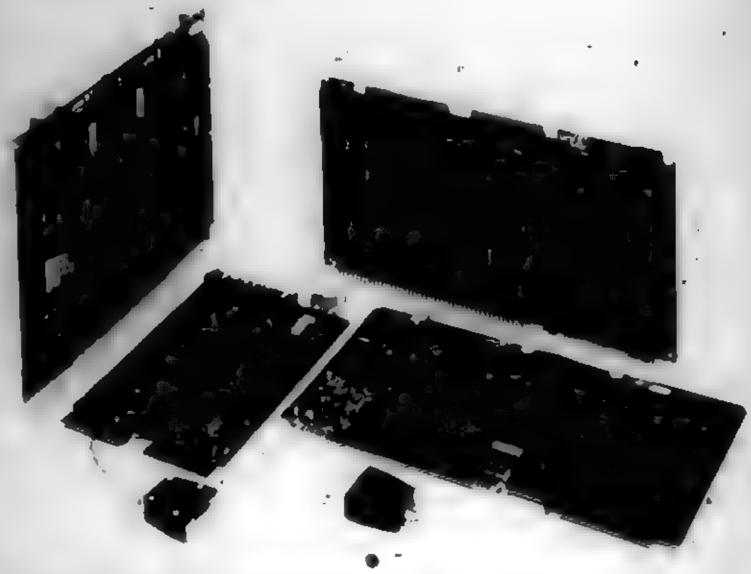

Available 99.98% of Time

Fire Department Hot on Mobile Dispatch System

PHOENIX — The city's fire department here has completed the first nine months of operation of an advanced computer-aided dispatch and mobile digital terminal system. During this time, the system has been available 99.98% of the time.

The computer-aided dispatch and mobile digital terminal system was designed to support the needs of the fire departments of Phoenix, Glendale and Tempe, Ariz. It reportedly serves an area of 540 square miles, with an estimated 225,000 dispatches annually.

The turnkey system, from Planning Research Co., Public Management Services, uses the latest technology, incorporating many new devices, applications and concepts. It is thought to be the first application of mobile digital terminals in the fire service.

The members of the project development team of the system had all served as fire fighters, which provided them with an understanding of the tasks that needed to be performed by the system.

The system has improved the ability of the departments to respond to emergencies by making it possible for dispatchers to keep up with the calls during peak periods, a department spokesman said. It has increased the safety for the public and fire personnel, has allowed more effective assignment of personnel and equipment and has automated data collection for management reports, according to a department spokesman.

The system is currently operating in 47 fire stations, 148 mobile digital terminals, 10 administrative sites and 100,000 dispatches annually. Each fire station has a Zilog, Inc. Z80 microprocessor connected to the host computer via a 2,400 bit/sec asynchronous modem to provide multiple switching and monitoring functions, as well as to serve as an interface to the Digital Equipment Corp. VT100 CRT terminal and Epson America, Inc. printer in each station.

Two Levels of Backups

To ensure reliable operations continuously, three DEC PDP-11/44s are used, each of which is capable of operating the total system. This provides two levels of backup instead of one.

The system, which costs $5.2 million and took 19 months to construct and implement, has approximately 250 microprocessors, all interacting with each other, and incorporates 225 fixed and mobile digital CRT terminals on-line 24 hours a day, seven days a week.

Each of the 12 custom dispatch consoles houses two 15-in. high-resolution color CRT terminals and has a 20-radio-channel control system that is fully microprocessor controlled and is fully redundant. Graphics are used for various applications such as charts, graphs, maps and building plans. The system can also print graphics in color, a department spokesman said.

Each console in the communications center can receive and process calls for service. Every call for fire and other emergency service is screened to determine the correct type of response required. After this initial screening, information about the emergency, referred to as an incident, is entered into the system by the console operator, a department spokesman said.

The system verifies the address, logs a record of the incident and prompts the dispatcher to obtain any missing information needed. The system will provide equipment recommendations and status information to assist the dispatcher in making his final decisions on what equipment and personnel to send to handle the emergency.

Once the dispatch decisions are final, equipment assignments are transmitted automatically to the field over dedicated data and voice telecommunications circuits and data and voice radio communications links.

Fire fighters and paramedics in the field receive the dispatch data on their CRT terminals and printers at their stations. Data on the emergency is simultaneously displayed on the mobile digital terminals in their vehicles.

Updates on the status of personnel, equipment and the emergency is transmitted via the mobile digital terminals to all units assigned to the incident. Communications center personnel use a geographic file to establish the exact location of the emergencies.

(Continued on SR/48)

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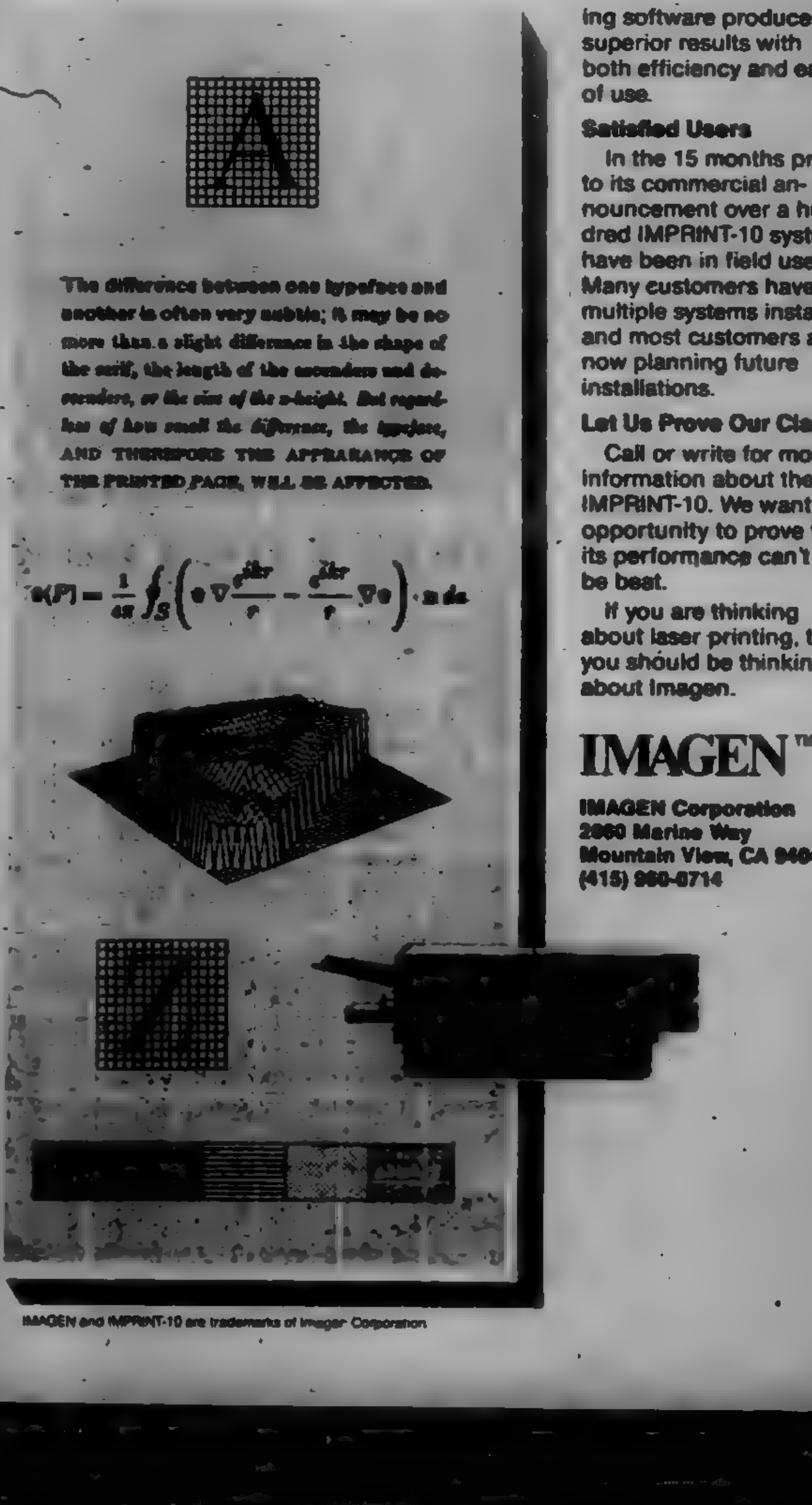
Practical Applications

The IMPRINT-10 provides line printer speed, daisy wheel quality, plotter graphics capability and typesetter font flexibility.

In the office, it's producing reports and internal documents at higher speeds and with substantially less noise than other printing devices. In data processing, it's delivering higher quality output than line printers in convenient 8½" x 11" page size. IMPRINT-10's allow graphic plotter users to merge high quality graphics with high quality text. Graphic arts applications include proofing for typesetting and demand publishing.

Proven Hardware, Exceptional Software

The IMPRINT-10 uses a proven electrophotographic marking engine that has provided reliable service to thousands. Exceptional software is the key to IMPRINT-10 versatility. After years of development at a leading university, Imagen's proprietary image processing software produces superior results with both efficiency and ease of use.



The difference between one typeface and another is often very subtle; it may be no more than a slight difference in the shape of the serif, the length of the ascenders and descenders, or the size of the x-height. But regardless of how small the difference, the typeface, AND THEREFORE THE APPEARANCE OF THE PRINTED PAGE, WILL BE AFFECTED.

$$\phi(P) = \frac{1}{4\pi}\int_S\left(\phi\nabla\frac{e^{ikr}}{r} - \frac{e^{ikr}}{r}\nabla\phi\right)\cdot\mathbf{n}\,ds$$

Satisfied Users

In the 15 months prior to its commercial announcement over a hundred IMPRINT-10 systems have been in field use. Many customers have multiple systems installed and most customers are now planning future installations.

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Irrigation Salesmen Above Water With System

(Continued from SR/46)

The sales people carry terminals, like briefcases, into the farmer's home or office and then ask the farmer a series of standard what-if questions. The questions relate to, among other things, pipe lengths and diameters required, water supply used, terrain characteristics and energy sources available to the farmer.

The sales people then type the information on the 745's keyboard, sending it directly to the host over commercial phone lines. Within 15 minutes, the terminal receives and prints out a computer-generated analysis with comparisons showing which of several Valmont or competitive systems would be the most energy-efficient and least costly for any particular farming operation.

Before the data terminals were acquired, the salesman analyzed the customer's needs by using a calculator and writing out long and complicated mathematical formulas while the farmer waited. This analysis took four to five hours, compared with the 15 minutes consumed with the present modus operandi, according to a spokesman for Valmont.

The host system runs about 40 programs that cover all technical and financial aspects of irrigated farming, the output of which is accessible via the remote terminals, the Valmont spokesman said.

Valcom also has a message system whereby each Valcom user has a numbered file recorded with the host system.

To communicate with a field employee, Valmont headquarters records a message in the employee's numbered file. When the employee calls in his number at the end of the day via the terminal, he automatically receives a copy of the message.

System Aids Department

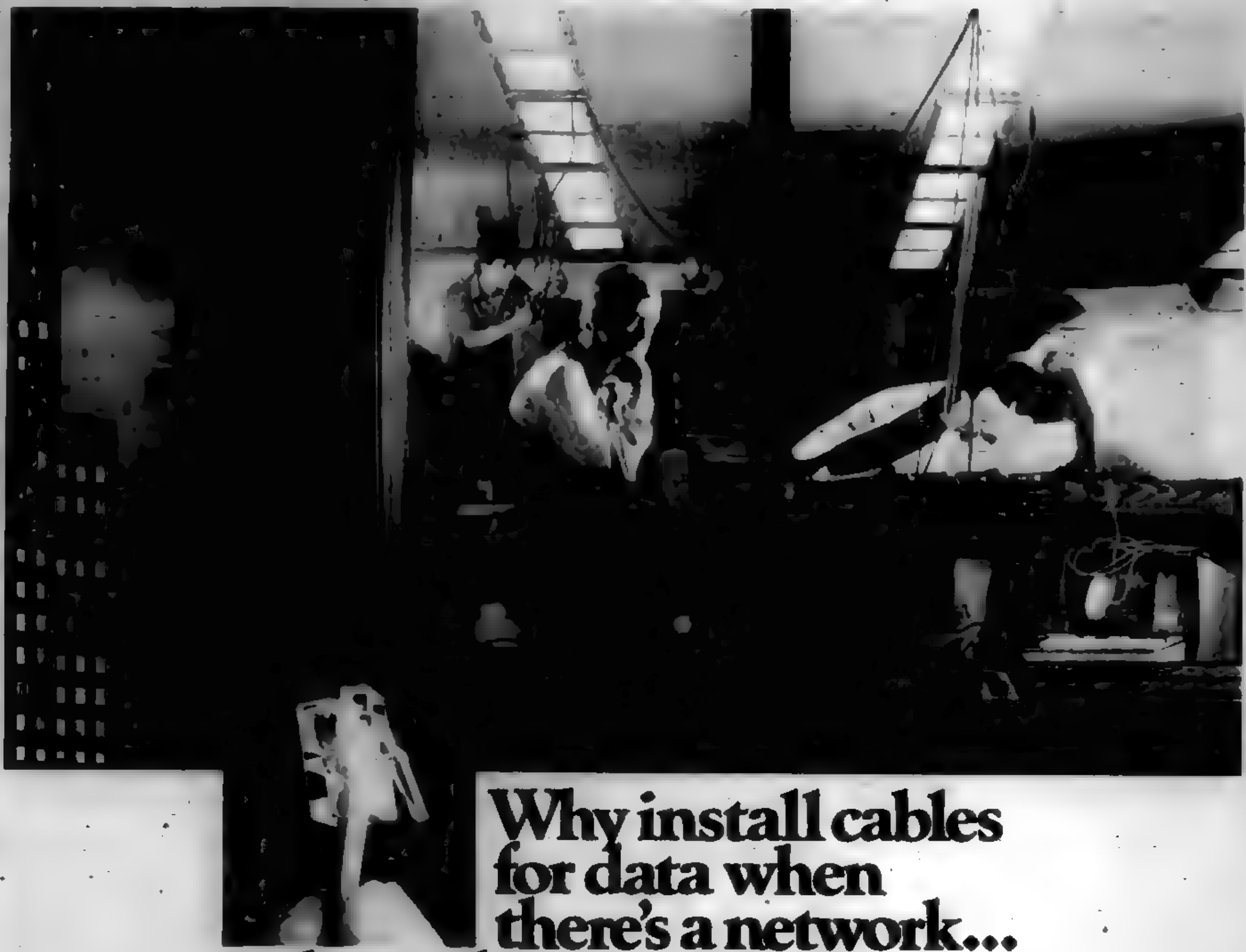
(Continued from SR/47)

The file provides information on specific buildings involved in the incident and on any hazardous conditions. The file also detects possible duplicate calls and alerts the operators, a spokesman said.

The mobile digital terminal subsystem itself is integrated with the dispatch system. The dispatcher at the communications center does not need to say or do anything in response to status messages being entered into the system. This reduces radio congestion and provides more accurate status keeping and reduced work loads for the dispatchers.

Administrative sites in the three departments are equipped with color video terminals and printers, which allow them to monitor departments activities and to carry out administrative functions such as maintaining personnel files, rosters and schedules, updating the various files, developing research statistics on emergencies and administrative message distribution.

The mobile digital terminal subsystem reportedly improves the reliability and speed of unit status reporting, making command operations more effective, and it allows fire units to communicate rapidly with all other system users, the department spokesman said.



Why install cables for data when there's a network... right under your nose! If you're tired of the endless hassle of expanding your local area network—not to mention the expense of installing cable and limited distance modems—Teltone has some very good news for you.

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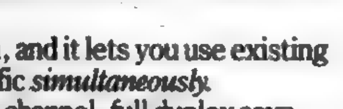

TELTONE

For users of DEC, Prime, Data General, Tandem, IBM Series/1, H-P and other asynchronous computers.

Firm Sticks With System to Trace Explosives

TAMAQUA, Pa. — A series of squat brick buildings surrounded by dirt bunkers lies secluded here in the mountains. The bunkers and remote mountainous terrain are ideal for the thousands of pounds of explosives stored in these magazines.

Such precautions are an everyday fact of life for Atlas Powder Co. and have been since the firm's beginning in 1912. In 1978, Atlas added another precaution: Each of the dynamite magazines has a CRT terminal linked to the company's computer center in Dallas.

These terminals help the firm control every stick of dynamite from manufacturer to customer. Getting the right product to customers at the right time with minimal handling is critical to Atlas. In addition to the Tamaqua location, the magazines covered by the terminals are scattered in such out of the way places as Joplin, Miss.; and Baxter Springs, Kan.

One reason for this extraordinary tracing procedure is that the U.S. Bureau of Alcohol, Tobacco and Firearms requires it. But an even better incentive, according to Atlas' director of data processing, Dan Johnston, is that Atlas' survival depends on it. "Safety is the number one corporate goal," he said.

Tracing every stick of dynamite to the site of its final use is not easy. In fact, Johnston said, "It's next to impossible without computers. Other methods can get close, but close isn't good enough." The traditional method of controlling explosives at the storage level is to keep a written log for each door of the magazine. When explosives are stored or removed, someone updates the log. Atlas' computer network not only provides a more dynamic and accurate accounting of explosives, it also enables the company to keep centralized records. When company officials or the Bureau of Alcohol, Tobacco and Firearms ask how many explosives Atlas has in its magazines scattered over several states, the answer can be instantly in hand.

Exercising another form of safety, Atlas chose a Codex Corp. processor to supply and maintain all the equipment in its data communications network — from front-end processors to remote terminals.

In Dallas, the IBM 4341 mainframe interfaces to Codex's 6520 front-end processor. Codex 6000 series intelligent network processors statistically multiplex the terminal traffic in the network to save on leased-line costs. The eight locations and associated terminals on-line to the CPU are multiplexed to two lines terminating in the front end. In case these leased lines go down, four dial back-up lines are available.

The multiplexed traffic on the phone line then passes through another set of multiplexers in Tamaqua and Joplin. But if the dial backup lines are used, an A/B switch configured by Codex can switch in a digital line-sharing device to bypass the multiplexer. CRT terminals and printers connect to this set of switches either directly or with modems over local phone lines. Additionally, the Frankfurt and Baxter Springs terminals tie to the multiplexers via long-distance phone lines.

Most Important Factor

Probably the most important network factor for Johnston is service. He cannot afford a system that does not work — and not only because high explosives are involved. "Payroll is a very critical system," he said.

Johnston recalled that one manufacturer's proposal to meet Atlas' communications needs did not meet the reliability requirements, confirming the emphasis on solid network design expertise. "They proposed a multidrop configuration, but if one terminal takes a hit on a system like that or a line breaks, you're down." The Atlas network is not subject to such limitation. "There is virtualy no way the net can fail," Johnston said, "unless the host computer or front-end processor fails."

Backup is one key to the network's reliability. Should any of the system's leased phone lines go down, the dial backup facilities come into play. Several Codex LSI-6 modems help accommodate slower backup lines by automatically switching from their normal 9,600 bit/sec transmission rate to 4,800 bit/sec. And T-bar relays can reroute traffic around any failed node. These provisions work well and help keep costs down.

The multiplexers have improved Atlas' terminal response time by about 60% compared to the multidrop approach. The 6030's polling method permits typical full-screen terminal response times of about four seconds, which increases to only eight seconds in the worst case when all terminals are in use. In contrast, terminals on Atlas' old multidrop net took six seconds to respond at best, and when all the terminals were in use, they took up to 22 seconds to respond.

These response-time improvements are important, Johnston said, because they equate to a productivity increase for the people who use the system. A system that responds 60% faster doesn't necessarily boost productivity 60%, but, in Johnston's case, the improvement is significant.

Integrated Office Systems Opportunities

As innovators in telecommunications, we at Northern Telecom Inc. have pioneered many revolutionary communications systems. We currently have a need for the following key individuals to put their experience to work for us in helping pioneer even more sophisticated systems for the integrated office.

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This position involves considerable decision-making and self direction and requires at least six or more years of experience in the telecommunications, data communications or distributed data processing industry in development, engineering and marketing areas. A strong technical background in both hardware and software is preferred. A Bachelor's degree in engineering or computer science is also required with an advanced degree desired.

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Responsibilities will include in-plant presentations and demonstrations, and handling inquiries regarding the product. Planning efforts to expand product capabilities will also be required along with keeping a current and accurate documentation of this product's growth.

At least 5 years of product related experience is required with a Bachelor's degree in Science, Engineering or Computer Science preferred. A knowledge of PBX products is essential for this position as well as familiarity with computers, computer products and computer programming. Excellent oral and written communication skills are also required.

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Chevron Routes Freight With Terminal Net

SAN FRANCISCO — To alleviate its freight rating and routing information problems and to help meet the challenges of deregulation, Chevron Chemical Co. here instituted an on-line freight rating and routing system.

McDonnell Douglass Automation Co.'s McAuto Freight II has greatly simplified and streamlined Chevron's rate maintenance operation and has provided people in marketing, manufacturing, distribution and traffic with more control over freight activities.

Chevron, the largest nonpetroleum subsidiary of Standard Oil Co. of California, realized it had a significant problem maintaining freight rating and routing information in an efficient, cost-effective manner.

Every time the traffic department received a rate quotation request, the tariff analyst had to delve into tariff after tariff of complex freight rates to find out which ones applied and to determine the correct charges. This often took a full day including research work.

Rapidly changing tariff structures complicated the matter even further, frequently resulting in incorrect freight bills. Typically, this meant an overcharge to the shipper.

By law, Chevron had to pay the carrier in seven days, but was not refunded the overcharge until 1½ years later, due to the extensive backlog of bills that its traffic department had to audit manually. As a result, Chevron lost thousands of dollars in interest that it should have been earning on the overpaid amount.

McAuto Freight II centralizes rate and route data, speeds and simplifies the process of updating information, enables rate changes to be made in minutes, makes data accessible to all authorized users in seconds, ensures that the proper rate and charges are applied and reduces the need for manual rate and route guides.

Chevron produces industrial and agricultural products. In order to load data to cover this extensive product line, McDonnell worked with Chevron in devising a logical and strategic plan.

The company began with its Ortho Fertilizer Division, which was loaded region by region, starting with Dallas. This division develops fertilizer products that meet a wide variety of soil and crop needs. This fertilizer is shipped in bulk in trucks with a 20- to 25-ton minimum weight per truck or by rails with a 100-ton minimum weight per rail car..

The company's Petrochemicals and Oronite Additives Divisions were completed next. The Petrochemicals Division produces and markets "building block" chemicals.

The Oronite Additives Division is a major manufacturer, developer and supplier of petroleum additives. Oronite Additives improve the performance of engine types. Both the petrochemical products and additives are transported in trucks with a 22-ton minimum weight per truck or by rail with a 100-ton minimum weight per car.

Chevron selected McAuto Freight over other rating and routing systems because it offered the company what it needed to control its large volume of shipments subjected to ever-changing rate and carrier conditions.

"McAuto Freight provides ready access to past and up-to-the-minute rail, truck route and rate data bases — allowing personnel in marketing, distribution, manufacturing and traffic to retrieve rates and routes directly from the computer," said Cal Allen, manager of traffic at Chevron.

System Speeds Auditing

"The system also speeds up our freight bill auditing considerably. Now we're able to audit a freight bill in just two minutes on the average, as opposed to one hour to one day without the system," Allen continued.

Information for McAuto Freight is kept up to date through the use of CRT terminals which connect to the system. Chevron has terminals at 20 locations across the country, connecting to an IBM 3033 mainframe computer with the OS/MVS operating system and IBM's Information Management System.

Through a terminal in Chevron's San Francisco office, commands are keyed in by the traffic analyst to add, delete or update information. This data then is transmitted directly to the computer. Once entered, the requested command is completed and the new information is immediately available to any authorized user.

Inquiries regarding rate data include point-to-point and mileage rates by origin, rates destination and product.

Chevron now is considering purchasing a new on-line, interactive system called McAuto Freight Bill Audit which allows shippers to simplify greatly the approval, payment and auditing of freight bills automatically.

Whisper Writer 1000 communicates via phone lines at 300 baud, TWX at 110 baud, and Telex at a proprietary 110-baud 66-wpm rate

The remarkable new Whisper Writer, from 3M.

Data communications, TWX, and Telex. All in one compact machine, at an astonishingly low price.

Make a modest investment in 3M's new Whisper Writer 1000 and you'll be able to communicate with your own mainframe computer, a DDP network, or a time-sharing service. You'll also have the ability to send and receive messages by TWX, Telex, phone lines, or electronic message center, along with transmission to 3M's 9600 Facsimile Transceiver. In short, you'll be getting both a desktop communications terminal and a portable DP terminal for less than the cost of most single-purpose machines.

In its standard configuration the Whisper Writer comes with an internal modem, telephone jack, and programmable automatic answering feature. Options include a carrying case with acoustic coupler and an automatic line selector that lets you leave your Whisper Writer connected to both a telephone and a TWX line. A special version is available with an RS-232 interface in place of the standard modem for direct hookup to a computer, external modem, or CRT terminal.

When ordering any Whisper Writer, you can specify either a 40-column or 80-column printer. The unusually quiet thermal printing mechanism prints sharp, black-on-white characters at 40 cps and is able to produce graphics under the control of a compatible computer.

Editing memory lets you prepare text off-line.
Whisper Writer's four-page dynamic memory and editing features allow you to get messages and data letter-perfect before you dial. The result: lower phone, TWX, and Telex charges, along with less tying up of communications lines.

Easy to learn, simple to use.
The separate keyboard module in the Whisper Writer 1000 has a conventional typewriter layout. Additional function keys reduce the need for memorizing special control codes.

Also available as a low-cost RO teleprinter.
Whisper Writer can be ordered without a keyboard as a modem-equipped or RS-232-compatible, 40-column or 80-column printer. To add a keyboard later, merely buy the separate module and plug it in.

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Vendors Underestimate Demand

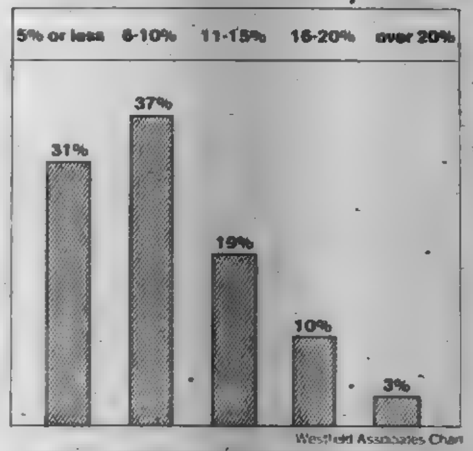
Users Would Pay for Diagnostics: Study

By Susan Blakeney
CW Staff

ST. LOUIS — Electronics product manufacturers are significantly underestimating the premium prices that users are willing to pay for new products that include self-diagnostic and remote-diagnostic features, according to Burt Mendelson of Westfield Associates here.

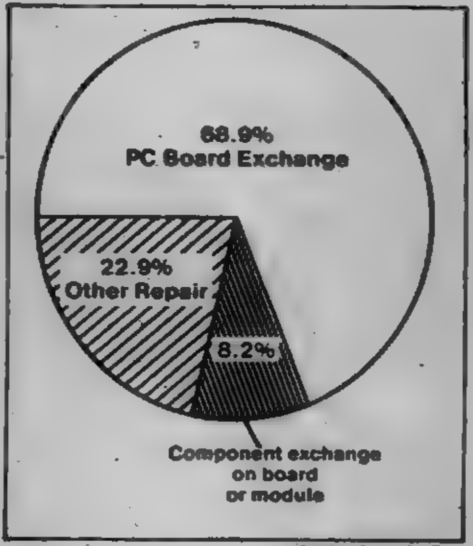
Mendelson based this statement on research conducted by his company and reported in "Tele-Maintenance Study." In the study, he predicts that self-diagnostic features will command only a 5% to 7% premium, whereas the bulk of the users expressed a willingness to pay as much as 10%.

Mendelson discussed some of the study's findings at the recent national conference of the Association of Field Service Managers in Houston. Mendelson pointed out that "remote diagnostics" means different things to different people: It is thought of as a technical concept, an effective sales tool, a practical necessity or a way of life. "Remote diagnostics is more than the technology on which it is based and less than a way of life. It is something in between which will become more prevalent in the next five years, and maybe even begin to be taken for granted," he theorized.



Westfield Associates Chart

Figure 1. Seventy-nine percent of the respondents said 'yes' when Westfield Associates asked users, 'Should vendors provide more built-in diagnostics?' For that 79%, the chart shows the percent increase in the cost of product justified.



Westfield Associates Chart

Figure 2. On-Site Customer Service by Board Exchange or Other Means

The level of self-diagnostics or remote diagnostics that manufacturers wish to build into the product, according to Mendelson, is the area that must receive the most attention in the design stage. "The economics of remote diagnostics is something like 'supply side' economics: You have to believe that an investment in an improved product design for easier field service will return more dollars to you in service cost savings than the dollars you invest," he said.

Mendelson recommended the follow-

(Continued on Page 58)

Tandy Adds Business System, 12M-Byte Disk to TRS-80 Line

FORT WORTH, Texas — Tandy Corp. has extended its TRS-80 series with an 8-bit, business-oriented system as well as a compatible 12M-byte hard disk drive.

Designed to handle applications requiring large information files such as accounting, inventory control and medical records, the TRS-80 Model 12 is available in either a single-disk version, priced at $3,199, or in a two-disk model costing $3,999. The system is reportedly compatible with all existing TRS-80 Model II software, which includes more than 50 vendor-supported packages.

The Z80A-based system's basic configuration is made up of 80K bytes of memory, a built-in 1.25 M-byte drive (a second 1.25 M-byte drive can be added), an enhanced version of the company's TRSDOS 2.0 disk operating system called TRSDOS 4.2 that supports double-density, double-sided floppy disks, a 12-in. green phosphor monitor, a detachable keyboard that features eight function keys, two RS-232 serial ports and an external disk bay port that

(Continued on Page 59)

Memory Prices Cut on DPS 6 Minis

WALTHAM, Mass. — Honeywell, Inc. has announced memory price cuts of up to 57% on its DPS 6 minicomputers, along with price reductions of up to 83% for related annual maintenance. In addition, the firm announced increased memory capacities on certain DPS 6 models.

Memory expansions using 64K random-access memory technology are now priced at $12,000 for a 1M-byte module, down from $28,000/M byte, the vendor explained. At the same time, the company unveiled a 64K-chip expansion board for its DPS 6/54 and 6/74 computers, thereby increasing the maximum memory capacity from 1M byte to 2M bytes.

Annual maintenance prices on 64K-chip memory expansion have also reportedly been reduced from $3,112 to $500/M byte, the vendor said. Price cuts are effective immediately. Further details may be obtained from Honeywell, Inc., 200 Smith St., Waltham, Mass. 02154.

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Vendors Underestimate Diagnostic Prices: Study

(Continued from Page 57)

ing checklist of questions to help manufacturers make decisions regarding a machine's diagnostics capabilities:

- Will it reduce the time needed to complete a service call?
- Will it assist the operator in identifying problems?
- Will it help the service person accurately pinpoint failures?
- Will it permit a remote diagnostics center to pinpoint failures?
- Will it reduce your spare-parts inventory of boards and components?
- Will it make the customers happier with your service?
- Will it help sell the customer a maintenance contract?
- Will it help sell the product itself?
- Will it encourage the customer to do his own board mapping — assuming you want him to do that?
- Will it help offer an extended warranty if the customer wants it?

In enumerating the possible benefits in remote and self-diagnostic capabilities, Mendelson produced a number of statistics from his company's research, as well as from various vendor and user group studies, to claim that 71.5% of the manufacturers surveyed considered their field service activity a profit center, while only 11.5% called it a cost center. The remaining 17% indicated that it was an overhead/budgeted type of operation. Sixty-six percent of those surveyed placed a high value on remote diagnostics to reduce the time needed to complete a service call, with 26% giving a medium rating and 8% assigning it a low priority rating.

Mendelson said the hourly rates for field service during regular working hours ran between $25 and $200; during overtime, these rates leaped from $40/hour to $300/hour.

"Remote diagnostics isn't necessarily going to get your department higher up the ladder," he said, "but it may give you an opportunity to get more visibility with engineering and other key departments as well as your management.

"If you are not already a profit center and it makes sense for you to be one, talk to your boss . . . If you are a profit center and your boss wants higher profits, try to show him that if you can properly influence the product design, you can make more profits," he advised.

Westfield Associates' study costs $2,500 from the company at Suite B, 787 Cross Creek Drive, St. Louis, Mo. 63141.

System Performs Video Graphics

CUPERTINO, Calif. — Via Video, Inc. has announced System One, a turnkey microprocessor-based video graphics system for firms with advertising, broadcast and cable TV applications.

The system features real-time animation, stop frame animation, color map animation, unlimited fonts, full color slide and transparency production capabilities and direct output to red, green, blue devices, the vendor said.

The system can also handle video output in accord with the National Television Standards Committee, the vendor said.

System One can emulate pens, rulers, brushes, rubber stands, animation stands, digital effects generators and character generators. The unit can also combine effects in unique ways, according to a spokesman for the vendor.

Systems cost from about $45,000. Via Video is headquartered at 10115 S. DeAnza Blvd., Cupertino, Calif. 95014.

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For Storage of Microfilmed Documents

Kodak Unveils Mini-Based Info System

ROCHESTER, N.Y. — Eastman Kodak Co. has announced a minicomputer-based information system for the storage and retrieval of microfilmed documents.

Called the KAR-4000, the system was designed for users with transaction-type applications who typically process from 1,000 to 7,000 documents a day or make 25 or more retrievals of such information, Kodak said.

The system can access on-line data and source documents from up to eight terminals and can operate either stand-alone or can be hooked up to a host computer in a distributed mode.

The company said that the KAR-4000 in its basic configuration consists of an Applied Digital Data Systems, Inc. (Adds) Mentor minicomputer with 128K bytes of memory, a Kodak IMT-150 microimage terminal, two Adds CRT display terminals, a 30M-byte Winchester disk drive and Acctex Corp. software. It can also support a Printronix printer, Kodak added.

Six different models of the system are offered ranging in memory from 30M bytes to 120M bytes. The 400 series will support up to four CRTs, and the 800 series will support up to eight CRTs. Kodak said that full hardware and software support is available.

Prices for the systems, which are available immediately, start at $70,000.

More information can be obtained from Eastman Kodak Co., 343 State St., Rochester, N.Y. 14650.

TRS-80 Series Enhanced

(Continued from Page 57)

allows printers, plotters and modems to be connected.

An optional card cage containing six additional plug-in slots to accommodate additional expansion boards is also available, a spokesman noted. Plug-compatible expansion boards include a Visicalc memory board that reportedly increases memory capacity to 144K bytes, a high-resolution graphics board, a Model 16 upgrade board that provides the Model 12 with 16/32 bit processing power and increases memory up to 512K bytes.

The new 12M-byte hard disk drive provides increased data storage capacity and offers faster access time through its Winchester technology. Intended for large inventory control needs, accounting and data base management systems, the unit's disk is compatible with Tandy's Model II, Model 16 and Model 12 software.

The 5¼-in. drive has three platters that use sealed media with a self-contained, recirculating filtered air system, Tandy said. Each of the six disk surfaces has one movable read-write head to access each disk's 230 data tracks.

The 12M-byte primary drive costs $3,495, while the secondary drive lists for $2,495. Tandy Corp. is located at 1800 One Tandy Center, Fort Worth, Texas 76102.

Semi Disk Cache Introduced

IRVINE, Calif. — A semiconductor disk cache has been introduced by Point 4 Data Corp.

The Lotus Cache Memory (LCM) consists of one or more printed circuit boards, each of which carries up to 1M-byte random-access memory (RAM). The LCM can be installed in Point 4's Mark 5 or Mark 8 or in other compatible computers such as Data General Corp.'s Nova 3 or 4.

The disk cache stands in the memory hierarchy between the CPU RAM and the user's disk system. In use, the most frequently used data and programs can be accessed reportedly without any of the delays associated with disk access.

Priced between $3,490 and $7,300, the boards are available from Point 4, 2569 McCabe Way, Irvine, Calif. 92714.

BTI Mark II Version Of 5000 Minis Out

SUNNYVALE, Calif. — BTI Computer Systems has unveiled a Mark II version of its 5000 16-bit multiuser minicomputer, which BTI said is 50% faster than its current models.

BTI is also offering a field-installable Mark II Upgrade Kit. Upgrades are said to be completely transparent to application software.

The Mark II costs $38,950, the Upgrade Kit costs $5,000, from 870 W. Maude Ave., Sunnyvale, Calif. 94086.

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Union Carbide's new Material Acquisitions Data Processing System is relying on CYX to economically distribute transaction processing capabilities to chemical plants across the country.

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Laser Printer Out For IBM Systems

TUSTIN, Calif. — General Business Technology, Inc. (GBT) has announced a laser printer for IBM System/34 and System/38 computers that is based around the Xerox Corp. 2700 electronic printer.

The GBT 6600XP interfaces with the host computer through a standard twin axial cable. It functions as a workstation printer without any software additions or modifications, GBT said.

For remote applications, the laser printer may be connected to the computer via an IBM 5251-12 display station. It costs $26,000, GBT said from 2630 Walnut Ave., Tustin, Calif. 92680.

Works With Apple II

Diskette Duplicating System Unveiled

SCOTTS VALLEY, Calif. — A diskette duplicating system said to be twice as fast as competitive duplicators at half the price has been unveiled by Mountain Computer, Inc.

The Floppycat 3200 reportedly initializes, copies and verifies up to 100 5¼-in. floppy diskette/hour, twice the duplication rate of other copiers. The Model 3200, in conjunction with the user's Apple Computer, Inc. Apple II computer and floppy disk drive, will copy Apple-compatible 13- or 16-sector diskettes.

The system's I/O hopper can hold up to 50 diskettes, which are copied from an unprotected master diskette. It automatically sorts out rejected copies, assuring the user of a steady supply of valid diskettes, the vendor explained. Once the hopper is loaded, it can run unattended, copying diskettes in 35 seconds. An optional 5M- or 10M-byte Mountain hard disk system can be used with the Floppycat for mass program storage applications such as cataloging and master files.

The duplicating system, including copier and software, costs $4,995. It will be available in April from Mountain Computer, 300 El Pueblo Road, Scotts Valley, Calif. 95066.

Z80A-Based Board Turns CRTs Into Personal Micros

SAN DIEGO — A Zilog, Inc. Z80A-based board that turns CRT terminals manufactured by Televideo Corp. and Lear Siegler, Inc. into personal computers has been announced by Data Systems Marketing.

The Microfit Instant Computer contains 64K bytes of random-access memory, two RS-232 ports, a Centronics, Inc. parallel interface and a floppy disk controller that can reportedly interface with either 5¼- or 8-in. disk drives. Up to four disk drives can be attached to the system, according to the vendor. Mass memory capacities range from 200K bytes to roughly 5M bytes.

The Microfit Instant Computer operates under Digital Research, Inc.'s CP/M operating system. It costs $1,450. Data Systems Marketing is based at 5710 Ruffin Road, San Diego, Calif. 92123.

HP Announces Speech Module

PALO ALTO, Calif. — Hewlett-Packard Co. has announced a speech-output module for its HP Series 80 line of microcomputers.

Called the HP 82967A, the unit comes complete with software for reviewing, editing and creating needed speech output. Software to run the module is provided on both a 5¼-in. and 3½-in. floppy disk, which can store up to 1,500 words. The module plugs into one of the four slots on the back of the Series 80 processor and is housed in the same basic package as the Series 80 modem, the vendor said.

The HP 82967A costs $375. More information is available from HP, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Disk Storage Systems Unveiled by Empak

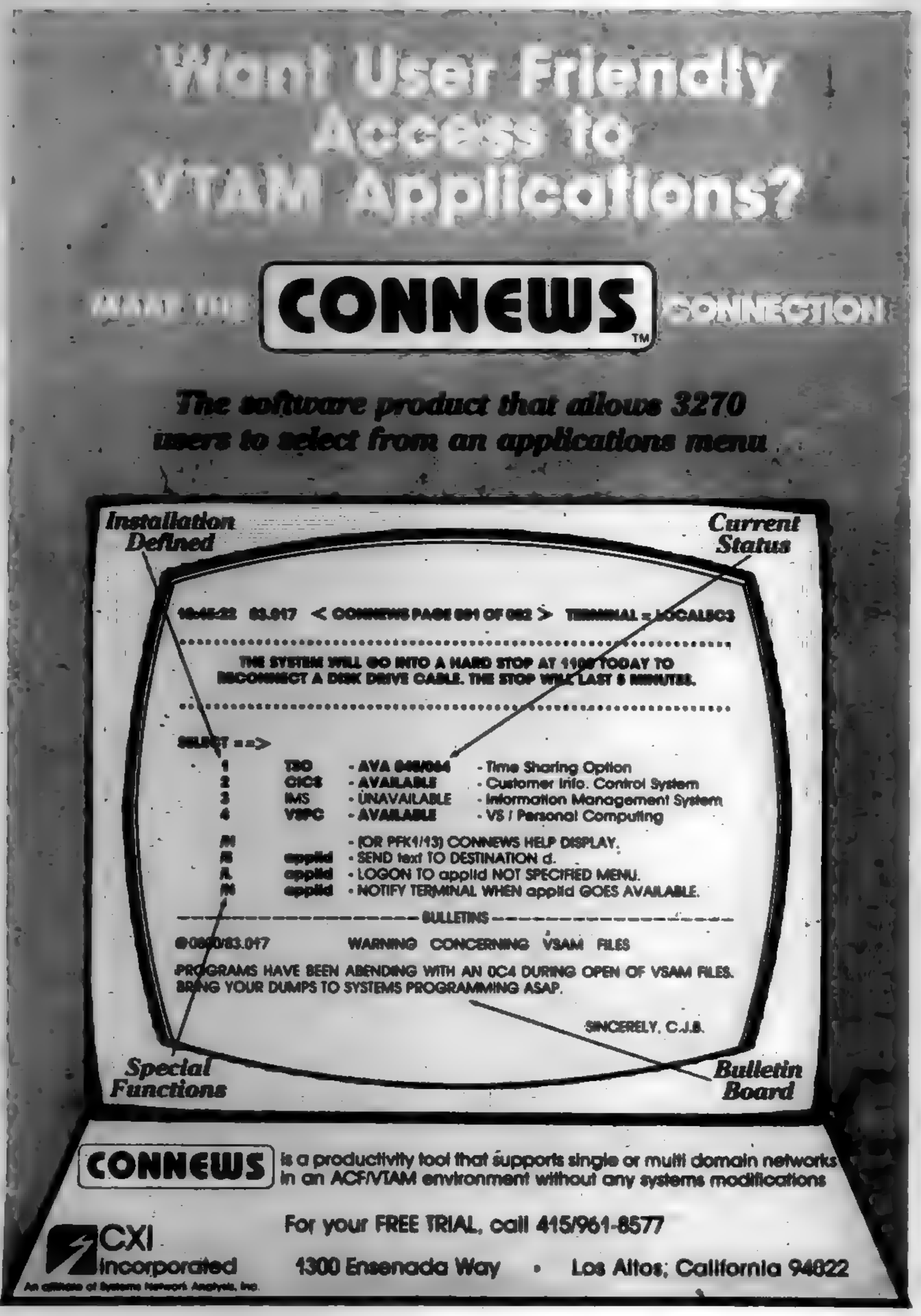
CHANHASSEN, Minn. — Multiple and individual memory disk storage systems are available from Empak, Inc.

The PH66-52 Multiple Disk Storage Box stores up to 25 5¼-in. diameter disks in a stackable box with removable latch top and bottom. The box features a large label area for identification of contents.

The B20-52 Individual Disk Storage Package was designed for easy access and secure closure, according to a company spokesman. It stacks easily and has a tapeable perimeter, he said. The design features a center hub that suspends the disk, reportedly eliminating surface damage.

The PH66-52 costs $7/unit and the B20-52 costs $1.76.

Free product samples are available from the firm through P.O. Box 448, 1501 Park Road, Chanhassen, Minn. 55317.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```
10:45:22  83.017  < CONNEWS PAGE 001 OF 002 >  TERMINAL = LOCALSC3
...................................................................
        THE SYSTEM WILL GO INTO A HARD STOP AT 1100 TODAY TO
      RECONNECT A DISK DRIVE CABLE. THE STOP WILL LAST 5 MINUTES.
...................................................................

SELECT ==>
      1      TSO      - AVA 048/064    - Time Sharing Option
      2      CICS     - AVAILABLE      - Customer Info. Control System
      3      IMS      - UNAVAILABLE    - Information Management System
      4      VSPC     - AVAILABLE      - VS / Personal Computing

      /H              - (OR PFK1/13) CONNEWS HELP DISPLAY.
      /S     applid   - SEND text TO DESTINATION d.
      /L     applid   - LOGON TO applid NOT SPECIFIED MENU.
      /N     applid   - NOTIFY TERMINAL WHEN applid GOES AVAILABLE.
-------------------------- BULLETINS --------------------------
@0800/83.017          WARNING  CONCERNING  VSAM  FILES
PROGRAMS HAVE BEEN ABENDING WITH AN 0C4 DURING OPEN OF VSAM FILES.
BRING YOUR DUMPS TO SYSTEMS PROGRAMMING ASAP.

                                             SINCERELY, C.J.B.
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Business-Oriented System Offers Multiuser Capability

SAN JOSE, Calif. — Altos Computer Systems, Inc. has introduced a business-oriented, 8-bit system said to be capable of supporting three users simultaneously and featuring up to 10M bytes of storage capacity.

Priced at $6,490, the Model 580-10's standard configuration includes a Zilog, Inc. Z80 processor, a 192K-byte random-access memory chip and a 5¼-in. 10M-byte hard disk drive that accommodates double-sided, double-density 1M-byte floppy disks. The Digital Research, Inc. MP/M II multiuser operating system also comes standard with the system.

Altos' Model 580-10

Explaining the advantages of the 580-10's multiuser capability, an Altos spokesman said users can share a data base and not have to maintain the same data base separately as they would with a single-user system.

The 580-10, like the vendor's Series 5, runs under the Digital Research CP/M, MP/M and Phase One Systems, Inc. Oasis operating systems. It is also compatible with the Altos Accountant WP and financial WP packages, which reportedly contains a user-friendly interface.

Altos said it will continue to offer its Series 5-5D, a 5M-byte system priced at $5,490 and the Series 5-15D which lists for $2,990.

Turnkey Aids Manufacturing

SMITHTOWN, N.Y. — Gull Resource Management Systems, Inc. has announced an automated manufacturing and inventory control turnkey system.

Based on the Prime Computer Corp. 2250 processor, the system includes software to handle inventory, purchasing, work orders, job costing, accounts receivable, accounts payable, general ledger, payroll and sales. In addition, the system can perform jobs-in-progress tracking, actual costs and profit analysis by job, the vendor said.

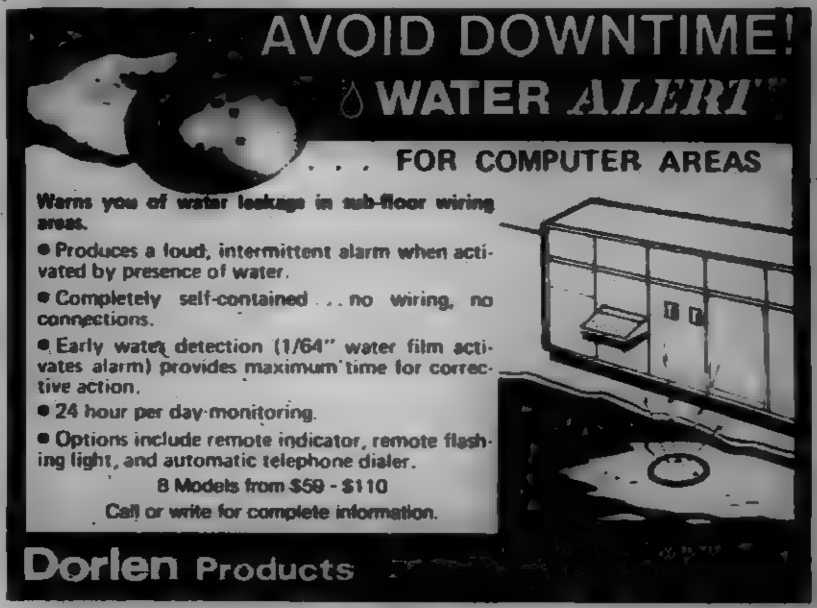
A base system costs $75,000, the vendor said through P.O. Box 9400, 100 Parkway Drive S., Smithtown, N.Y. 11787.

Superset Offers CAD Option

SAN DIEGO — Superset, Inc. has announced the availability of a printed-circuit computer-aided design (CAD) option for its Portable Graphics Mainframe computer system.

Supercircuit runs on the Superset 48-bit virtual memory computer, which can drive more than 40 different output devices, according to the vendor. Its features include: autorouting of up to 400 integrated circuits (IC); ground/pole plating of unfilled areas; 31 board layers; 30-in. by 30-in. board; wire list; wire wrap tape generation; multiwire tape generation; drill tape; photoplotter tape; interactive schematics; load checking with data base; extensive IC data base; and numerically controlled drill tape.

This product costs $5,000, the vendor said from 11035 Roselle St., San Diego, Calif. 92121.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Elgar can deliver the right system for you—from the Mini-UPS, designed primarily for low power applications such as microprocessor-based systems, data acquisition equipment and smaller microcomputers—to the large 50 kVA UPS employed with large data processing equipment or other sensitive systems.

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Ups Graphics Speed

DG Adds Light Pen to Workstation

WESTBORO, Mass. — Data General Corp. has added a light pen option to its Dasher G300 graphics workstation that increases the speed and functionality of graphics applications.

The hand-held Model 6154 is intended for computer-aided design and manufacturing applications, page layout for typesetting or computer-aided instruction functions. It can be used to select items from menu options, eliminating the need for typed instructions. It can also be used to draw, the vendor said.

A Dasher G300 workstation with a light pen is priced at $4,300. A field-upgrade kit to add the light pen costs $1,000.

More information is available from DG at 4400 Computer Drive, Westboro, Mass 01581.

Label Printer Provides Variable Info

ALLSTON, Mass. — Printer Products has unveiled a terminal/computer-driven 96-char. Ascii label printer said to provide variable information on labels.

The Model S400L dot matrix label printer is said to be capable of printing 50 char./sec up to 40 col. wide with 6 line/in. The system features positive sprocket feed, automatic self-test, positive label clamping and a printhead life expectancy of at least 15 million characters.

The software is available on virtually all applications, a Printer Products spokesman said. Interfaces include RS-232C, Centronics Data Computer Corp. parallel or 20 mA current loop, he added.

Available options include a 2K first in/first out buffer, form controls, custom colors and logos.

The printer costs $795. Delivery is available in 30 to 60 days, the Printer Products spokesman said from 24 Denby Road, Allston, Mass. 02134.

Gould Offers RS-232C Aid

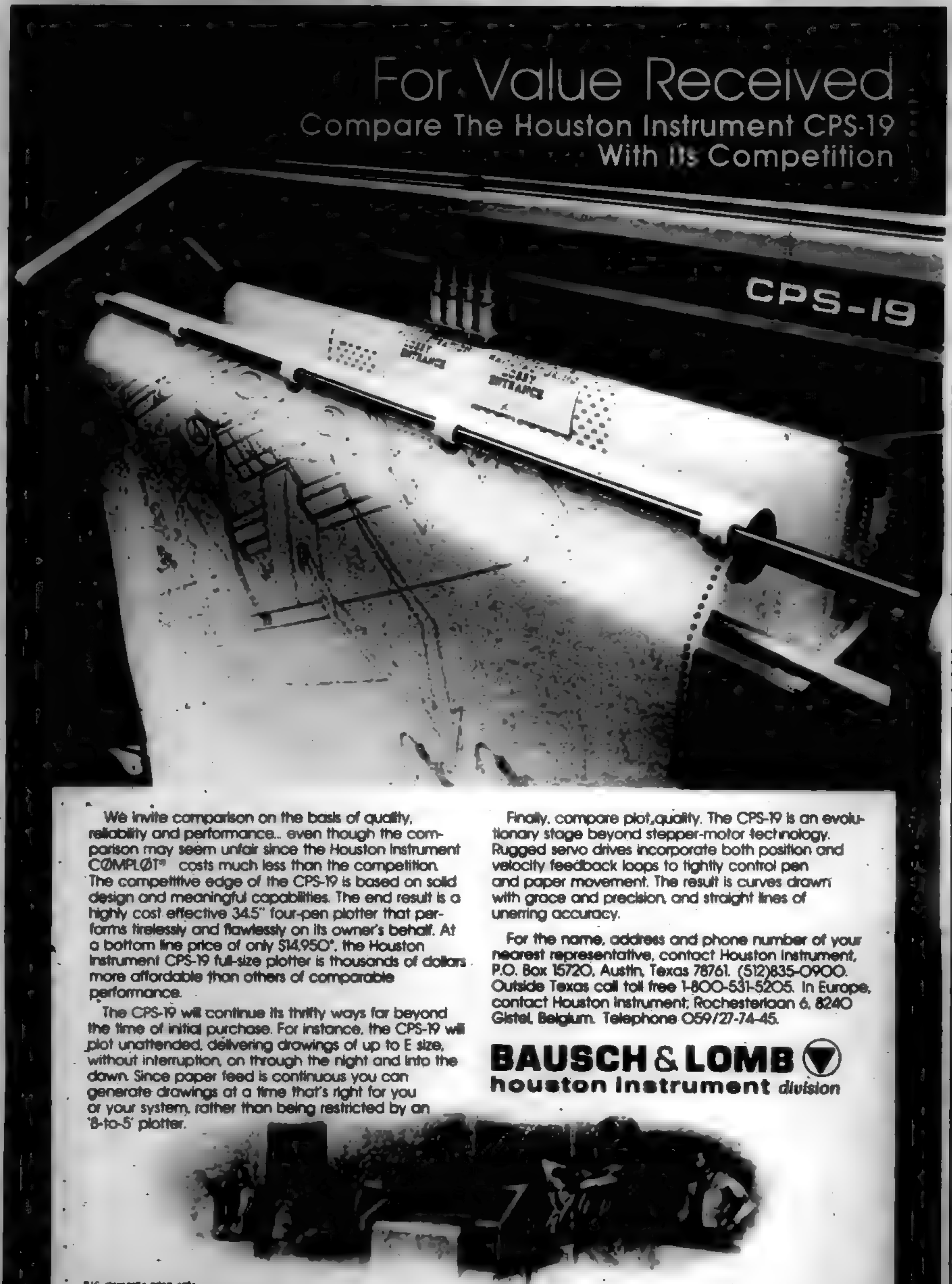
SAN DIEGO — Gould, Inc. has announced a RS-232C status and diagnostic interface option for use with its line of uninterruptible power systems (UPS).

The Digital Information System (DIS) reportedly provides transmission rate-selectable RS-232C output of 56 internal UPS status and alarm functions in standard Ascii characters.

Users can elect to use the DIS in a number of ways: display UPS status on a terminal, monitor the status of a remotely installed UPS at a project headquarters site, have on-line diagnostic assistance provided by Gould's Service Headquarters or provide UPS status to its computer load to enable the computer to protect valuable data in the event of power loss, the vendor said.

The DIS option is available with any Gould 6000 Series UPS ordered for delivery as of Jan. 1, the vendor said.

It is priced at $1,500, the vendor said from 2727 Kurtz St., San Diego, Calif. 92110.



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For the name, address and phone number of your nearest representative, contact Houston Instrument, P.O. Box 15720, Austin, Texas 78761. (512)835-0900. Outside Texas call toll free 1-800-531-5205. In Europe, contact Houston Instrument, Rochesterlaan 6, 8240 Gistel, Belgium. Telephone 059/27-74-45.

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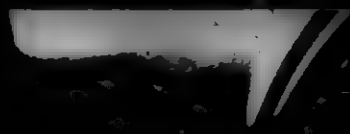

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TANDEM
NonStop Computing Systems

CDC Comma Service Expanded to 3033s

MINNEAPOLIS — Control Data Corp.'s Engineering Services Division has expanded its Comma processor maintenance program to include IBM 3033 systems.

The expansion enables CDC to provide maintenance services as well as installation/deinstallation and relocation services for the entire 30 series.

The service is currently available in 73 U.S. cities and includes a network of parts warehouses, hardware and software maintenance libraries and consulting services.

CDC can be reached at Box O, Minneapolis, Minn. 55440.

Bits & Pieces

Century Data Out With 14-In. Winnie

ANAHEIM, Calif. — Century Data Systems has announced a 513M-byte 14-in. Winchester disk drive that reportedly provides high-density storage capacity.

The Advanced Marksman Series 513 includes a basic drive, power supply and desktop enclosure.

Selectable dual access is available as an option, the vendor said.

The drive costs $11,400, Century said from 1270 N. Kraemer Blvd., Anaheim, Calif. 92806.

MSI Data Announces Bar Code Scanner

COSTA MESA, Calif. — MSI Data Corp. has announced the Datawand, a bar code scanning device said to offer 4,000 characters of memory.

The unit can read, decode, store and transmit bar-coded information independently of a data entry terminal. The unit is rechargable and can be used with any system incorporating an RS-232C interface, the vendor said.

The Datawand costs about $300, the vendor said from 340 Fischer Ave., Costa Mesa, Calif. 92626.

Graphics Unit Uses Mitsubishi CRT

LITTLETON, Mass. — Redac Interactive Graphics, Inc. has announced Cadet III, a color graphics terminal that uses a 19-in. Mitsubishi, Ltd. color raster CRT with a 512- by 512-pixel resolution.

The unit features eight user-defined colors, which can be assigned to various categories of data for clearer design representation and reduced operator fatigue, the vendor said. The unit was designed for computer-aided design and manufacturing applications.

The unit costs about $50,000 and the vendor can be reached through P.O. Box 7, Littleton, Mass. 01460.

Megatek's 'Template' Fits Genisco G-1000

COSTA MESA, Calif. — Additional software compatibility for the Genisco Computers Corp. G-1000 raster graphics terminal has been announced here by that company.

The 16-bit microprocessor-based terminal is now compatible with Megatek Corp.'s Template software.

The G-1000 is priced below $10,000, the vendor said from 3545 Cadillac Ave., Costa Mesa, Calif. 92626.

Imlac's Model 8000s Support CAD Tool

NEEDHAM, Mass. — Imlac Corp. has announced that its Model 8000 Series II Intelligent Computer Graphics terminals now support Easinet, a three-dimensional computer-aided design (CAD) package developed by Engineering and Scientific Computer Pty.

Easinet runs under Data General Corp.'s AOS and AOS/VS operating systems.

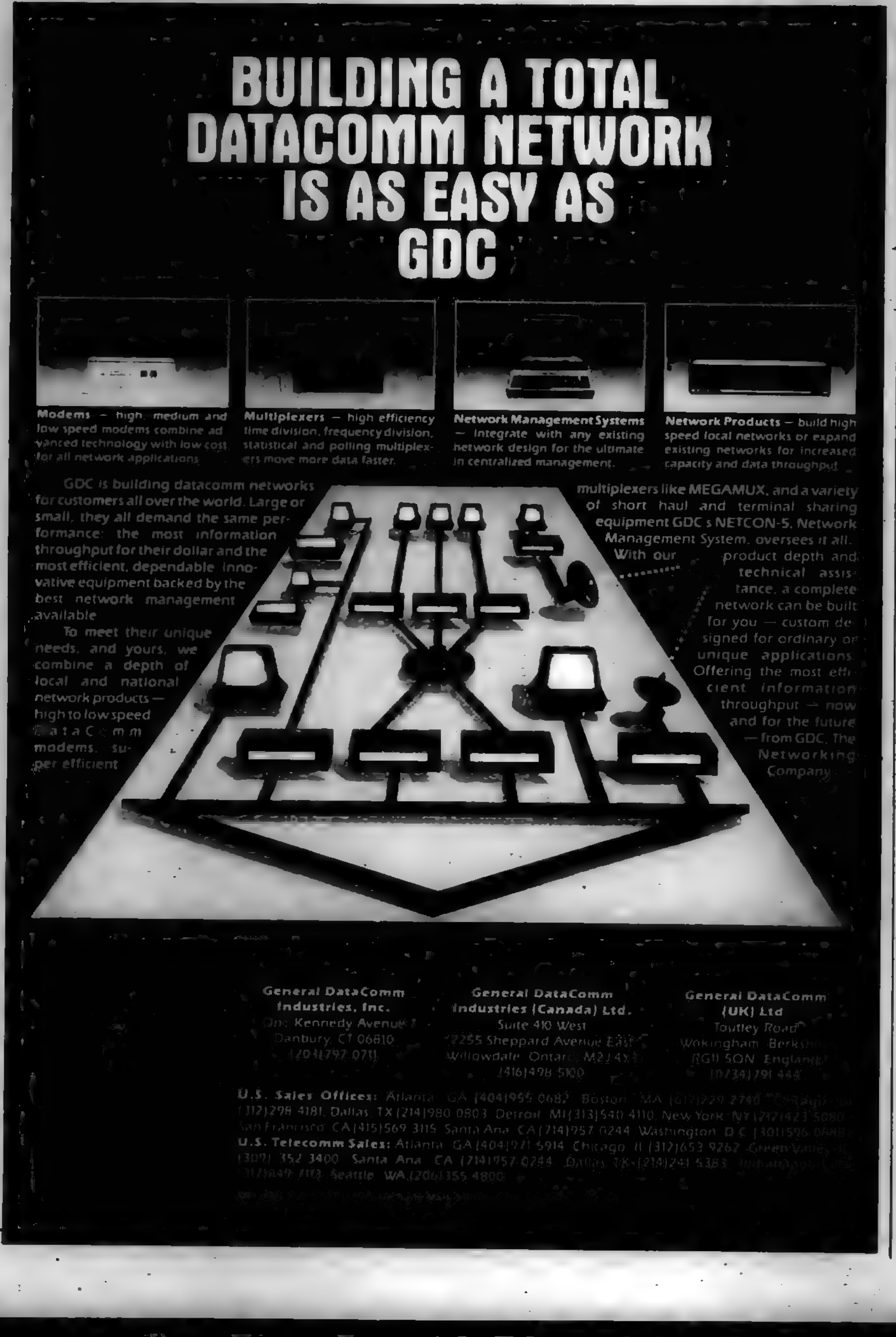
The product costs between $50,000 and $60,000. Imlac is located at 150 A St., Needham, Mass. 02194.

HP Plotter Module Links HP-41s to 7470s

PALO ALTO, Calif. — A plotter module to generate graphics and bar code with the Hewlett-Packard Co. HP-41 hand-held computer has been announced by the firm.

The plotter module reportedly allows users to link their hand-held computers to the HP 7470 color graphics plotter. The HP-41, with the plotter module, is connected to the HP 7470 graphics plotter via HP's Interface Loop.

The module costs $75 from HP at 3000 Hanover St., Palo Alto, Calif. 94304.



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NBI Boosts Oasys 64 Line, Cuts Oasys 8 Prices

BOULDER, Colo. — NBI, Inc. has introduced two clustered office automation systems to expand its Oasys line.

The Oasys 64-20 features 20M bytes of storage and the Oasys 64-30 features 30M bytes of storage. Both systems support eight peripheral devices and are upgradable to any large system in the Oasys 64 series, a vendor spokesman claimed.

The two systems are designed to fill the product gap between the company's Oasys 8 series and the Oasys 64-69. The Oasys 64-20 is available for $17,900; the Oasys 64-30 for $20,900.

The company has also announced price reductions for the Oasys 8 series with 2M bytes of storage from $11,900 to $9,900. All Oasys 8 configurations have been reduced by $2,000, a vendor spokesman said.

The Oasys 3000-S stand-alone system has been reduced in price from $7,400 to $6,900 and the NBI Docuwriter word processing system has been reduced from $5,400 to $4,900.

NBI can be reached through P.O. Box 9001, Boulder, Colo. 80301.

'Office-Mate/LP' Out for IBM CPUs

SCHAUMBURG, Ill. — National Systems Laboratories has introduced software for on-line list management and processing. The package is said to offer on-line terminal operation, security of data, automatic list management and the capability to print labels, envelopes and reports.

A menu-driven package with preformatted screens, Office-Mate/LP runs on an IBM 370, 4300, 30 series and compatible mainframes running under DOS/VS or OS/MVS with CICS.

A perpetual license for Office-Mate/LP costs $10,000 for DOS sites and $13,500 for OS sites. More information is available from National Systems Laboratories, 999 Plaza Drive, Schaumburg, Ill 60195.

Tests Designed to Gauge Job Applicants' Skill Levels

By Jim Bartimo
CW Staff

ROCKVILLE, Md. — Is there a surefire method of ensuring that employees hired to work on any given office system are as technically proficient as they claim to be? An office automation consulting firm based here believes the answer is emphatically "yes."

The firm has designed a set of tests to measure a job applicant's skill level on a particular type of equipment in the place of employment. There is a need for this type of testing, according to John L. Howard, president of Wordpro, Inc., because vendors are becoming less and less involved in training. "Regardless of what the vendor says about user-friendliness, [the equipment] is not any easier to use — especially if there are a lot of functions," he claimed.

The myriad of functions on many office systems is another reason Howard saw a need for testing. Because training by the vendor, or internally, is often lacking, the user often finds his own way to execute certain functions. These methods are often not the most efficient. "They don't want to admit that they didn't learn anything at the four-day training session," Howard said, "and if they call, the vendor doesn't know what he's talking about."

"Over the course of eight years, we had been doing a lot of implementation work," Howard said. "The people in needs assessment asked for some testing. I couldn't figure out why someone hadn't done this earlier."

So, Howard devised a set of two similar tests for each of 13 systems, including systems from NBI, Inc., Digital Equipment Corp., IBM and Wang Laboratories, Inc. The 25 questions take approximately 20 minutes to complete and are meant to be an indicator of skill, not aptitude, Howard pointed out.

For the $75 fee, the employer gets two different but equal versions of the test based on his type of equipment, and an answer sheet for correction. "It's not the ultimate answer," Howard continued, "you still have to check references" and follow other standard personnel procedures.

However, there is one area where the technical skills test is succeeding quite well on its own: "The temporary [employment] industry has gone crazy with it," Howard said.

Another office automation consultant said that testing is a positive step and agreed that it is not the ultimate answer. "Anything that gets people thinking more innovatively about hiring in the automated office is positive," according to Thomas Billadeau, president of The Office Systems Consulting Group, Inc. of Boston.

While a test may help an employer judge a candidate on his technical ability, other factors should be considered, he explained. A combination of a skill-aptitude that would test the potential of an employee to learn about a system would be ideal, Billadeau said.

"[Trained] word processing people are not out pounding on doors," he said, adding that such a aptitude test that also tests skill may prove to be even more successful as these trained people become increasingly difficult to find. As office systems become increasingly easier to use, a skill-aptitude test may help find potential candidates who are ideally suited for a particular job.

Interface Links IBM Micro to 3274

LOS ALTOS, Calif. — An interface board and associated software that reportedly allows owners of IBM Personal Computers to use coaxial cable to connect the machines to the IBM's Model 3274 and 3276 cluster controllers has been introduced by CXI, Inc.

Pcox is said to be transparent to IBM operating systems and access methods and enables the Personal Computer to emulate the Model 3278 and 3279 CRT terminals without requiring any host or application-software changes.

Pcox reportedly allows the micro to connect with any channel-attached 3274 or any remote 3274/6 operating either in binary synchronous control mode or Systems Network Architecture/Synchronous Data Link Control environments.

The interface board costs $910, with the accompanying keyboard/display handler, subroutine package and file transfer utility software available for an additional license fee of $285. CXI is based at 1300 Ensenada Way, Los Altos, Calif, 94022.

Contelnet Gets X.25 Interface Capability

GREAT NECK, N.Y. — Contel Information Systems, Inc. has introduced X.25 interface capability for its Contelnet local-area network.

The X.25 Domain software package is said to offer a bridge between the local-area network and an X.25 network; enable X.25 data terminal equipment to intercommunicate using X.25 levels two and three; and enable asynchronous teletypewriting devices to access X.25/X.29 data terminal equipment hosts, a vendor spokesman said.

The interface is available for $15,000 from Contel Information Systems, 130 Steamboat Road, Great Neck, N.Y. 11024.

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Best Performance in Recent Years

IBM Revenues Not Hurt by the Recession

By Bill Laberis
CW Staff

ARMONK, N.Y. — Despite a listless worldwide economy, IBM has reported bottom-line figures for 1982 that point to the company's best market performance in recent memory.

Revenues for the year ended Dec. 31 were reported last week at $34.4 billion, an 18% increase over 1981's $29 billion revenue figure. This is the largest percentage revenue gain since the mid-1960's, and reflects IBM's volume shipments of its high-end processors in the 3080 series, industry observers said.

Net earnings in 1982 rose 22% to $4.4 billion or $7.39 per share compared to $3.6 billion or $6.14 per share in 1981, once again making IBM's profits higher than the revenues of all but a few of its competitors. Reflecting a strong domestic performance, IBM's earnings from U.S. operations rose 34% over the previous year.

The earnings picture was enhanced by the company's adopting the Financial Accounting Standard Board's (FASB) so-called Rule 52, which added $449 million to shareholders' purses in 1982, half of that accruing in the fourth quarter alone. FASB 52 allowed IBM to record the effects of changes in foreign currency values relative to the U.S. dollar.

"It was an excellent year by anyone's standard," said Jack Hart, industry analyst for International Data Corp. (IDC). "I think they'll have to stretch it some to repeat this performance in 1983."

Hart said IBM's revenues increased "slightly more than we expected," terming both the revenue and earnings figures "remarkable when you consider the shape of the economy."

Both bottom-line figures — record highs for the company — were bolstered by IBM's aggressive pricing policies of 1982, designed to discourage rentals and to foster outright purchase of equipment, particularly high-end processors and disk drives, Hart said.

According to the company's figures, gross income generated by equipment sales increased 30% last year, while income from services jumped 20.6%. Rental income, however, increased only 2.6% for the year, and actually decreased 4.4% in the fourth quarter of 1982.

"That's a strategy that will continue into 1983 and beyond," said Harry Edelson, vice-president of research with the First Boston Corp., of IBM's aggressive equipment purchase policies

Edelson, unlike Hart, said he believes IBM can and will repeat its strong 1982 market performance in 1983. IBM benefitted by shipping its large processors during the most favorable part of the product cy-

(Continued on Page 68)

Sporck: National Semi Prefers Independence Over a Sellout

By Robert Batt
CW West Coast Bureau

SANTA CLARA, Calif. — National Semiconductor Corp. will not follow chip rival Intel Corp. in seeking a capital injection boost from a major mainframe vendor, Chief Executive Charles Sporck said here recently.

The company, which posted a loss of $3.5 million in the latest quarter, prefers to satisfy its capital requirements through asset management and thus maintain its independence, Sporck said.

"We think it is important for our customers that they have the security of a supplier unencumbered in terms of commitments to any one customer," he maintained.

A recently proposed deal between IBM and Intel will give IBM 6.25 million shares (a 12% minority interest) in Intel for $250 million. Some industry observers have speculated that the friendly agreement may forecast future deals between chip

(Continued on Page 68)

Charles E. Sporck

E. Floyd Kvamme, former president of National Advanced Systems, Inc. a wholly owned subsidiary of National Semiconductor Corp., recently resigned to become executive vice-president of marketing and sales for Apple Computer, Inc. He will be responsible for coordinating the marketing strategy for Apple's recently announced Lisa personal computer.

An exclusive interview with Kvamme, discussing his views and strategies on the computer industry begins on Page 69.

Teams With U.S., Japanese Firms

IBM Forms Japan Leasing Firm

By Tom Henkel
CW Staff

TOKYO — IBM has joined forces with Morgan Guaranty International Corp. and a Japanese leasing firm, Orient Leasing Co., to lease and offer creative financing here on all IBM systems.

The three firms formed a new company, tentatively called Japan Computer Leasing Co., which opened its doors early this month. An IBM spokesman said the new company will function much like the IBM Credit Corp. in the U.S., offering long-term leases and financing for virtually everything IBM makes.

IBM has a majority interest in the new firm, owning 36%. Oriental Leasing owns 35% of the firm and Morgan Guaranty has a 29% interest, IBM said.

(Continued on Page 72)

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National Semi Won't Follow Intel's Lead: Sporck

(Continued from Page 67)

manufacturers desperately searching for cash to finance the high cost of research and development and mainframe vendors dependent on semiconductor firms for vital components.

Sporck said that one of the problems with such a deal is that it may give a financial backer like IBM an undue influence over the supply of components.

"We would not want to solve our capital requirements through selling off a proportion of the company. We believe there are other ways to solve the problem, as, for example, in asset management where you manage your cash requirements in a more efficient way than your competitors," he asserted.

Capital alone is far from being the only ingredient in the success formula in the semiconductor industry, he said. "It's critical if you are a broad-based supplier to have customers that feel comfortable they are in an even position relative to their competition in terms of your support."

Looking to the immediate future, Sporck guessed that National Semi and other chip manufacturers would continue to turn in poor financial performances until there is a marked upturn in the economy. No amount of cost reductions or asset management will solve the problems on their own, he added.

Sporck predicted a modest increase in business performance in 1983 as inventories, built up last year on the false assumption there would be an economic recovery in 1982, are used up and order rates begin to approximate more closely the consumption of components. Then, he claimed, 1984 would see a great surge in demand for semiconductors.

"The chips are getting so powerful that, if you make one mistake too many, you can severely impact your place in the market, unlike in the past when development costs of one product were relatively modest and the size of the gamble was nowhere near as great as it is now," he said.

IBM's Bottom-Line Figures In '82 Soar Above Recession

(Continued from Page 67)

cle in 1982, "and this year IBM will shift into shipments of other models . . . the 3083 will take over from the 3081, and shipments will remain strong," Edelson commented.

IDC's Hart predicted that IBM will become the dominant revenue producer in the personal computer business in 1983. Both Hart and Edelson also predicted that the company will announce a high-end personal computer to compete with the likes of Apple Computer, Inc.'s recently unveiled Lisa personal business computer.

High-End 4300 Series CPU?

Edelson speculated further that IBM is destined to announce a high-end 4300 series processor, while Hart is looking for an announcement early this year of a system "that will penetrate the market the way the System/38 has not." Hart said he doesn't see the company "shipping any 4331s this year," and guessed further that IBM will find it hard to maintain shipments of high-end processors at its 1982 level.

"This points to the possiblilty of major product announcements which will come early in the year to allow for some shipments by year's end," Hart said.

IBM meanwhile also announced fourth quarter results, in which the company recorded record revenues and earnings. Earnings were pegged at $1.5 billion, or $2.50 per share, compared with $1.17 billion the same quarter a year before, a 30% gain. Revenues for the period were $11 billion, a 22% gain over the $8.9 billion posted the same quarter the previous year.

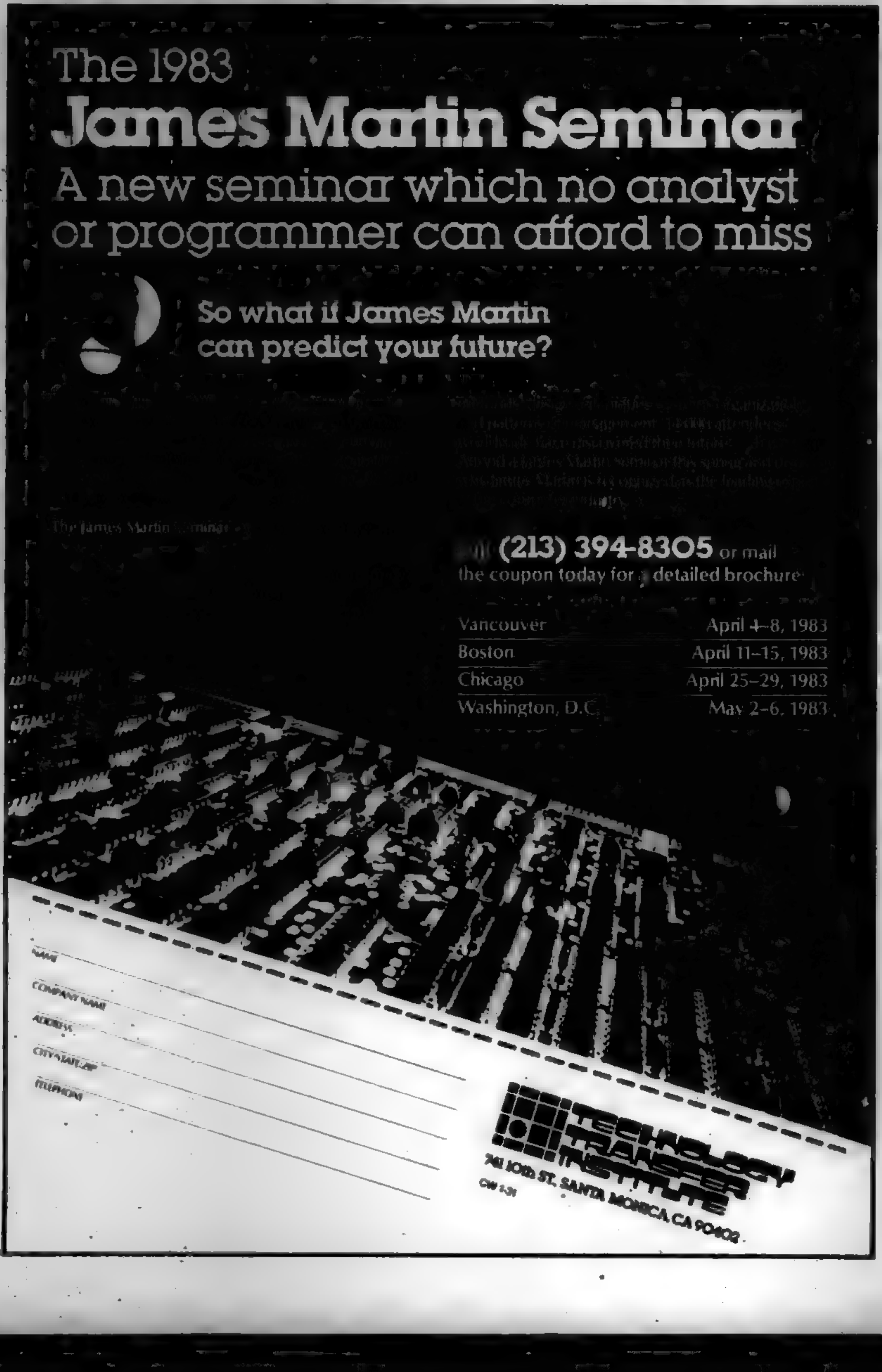
Commenting on the results, John R. Opel, company president and chief executive officer, said, "The 1982 results show significant growth for both net orders and net installations. Shipments of the 3080 processors and the 3380 [disk drive] are strong."

NCR Earnings Show Upturn

DAYTON, Ohio — NCR Corp. reported a 1982 earnings increase of 13% from the previous year to $234 million or $8.75 per share, versus $208 million or $7.72 per share the previous year. Annual earnings figures included a $90 million or $3.35 profit level recorded in the fourth quarter alone.

Revenues in 1982 rose 3% to $3.52 billion from $3.42 billion in 1981.

William S. Anderson, NCR chairman, said, "The company's gains in income on modest increases in revenue reflect the results of our continuing programs to control costs and expenses."



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To Become Apple's No. 2 Man

Lisa's Adopted Uncle Tells Why He Left NAS

E. Floyd Kvamme, 45, joined National Advanced Systems in 1967. He quickly moved from product marketing manager to vice-president of marketing and then to Semiconductor Division general manager before taking over the helm at NAS when it acquired troubled Itel Corp.'s computer customer base in 1979.

Kvamme succeeded in establishing NAS as a forceful competitor in the growing IBM plug-compatible mainframe market. However, toward the end of his career at the company, NAS faced increasingly stiff competition from IBM.

The day after the announcement of Apple's Lisa, Kvamme discussed his days at NAS and his new career at Apple with Computerworld *West Coast Correspondent Robert Batt.*

You have just resigned the top position at a fairly successful mainframe manufacturer to take up what is essentially a No. 2 job at Apple Computer. What was your motivation?

When I resigned from NAS, I had been with the National Semiconductor Corp. for 16 years and had been very involved in the semiconductor industry. When I agreed to take on the job at NAS, the one thing that it did not have was the variety of work that I had enjoyed so much in my days at the Semiconductor Division . . . When I felt the people we had there could carry the ball, I decided it was time to leave because I wanted to gain some of that variety of work again.

When Apple asked me to consider this job, I initially was not aware of the variety of work there is in the personal computer business. But as I came to see the possibilities in the scientific, education, home and — most important — office markets, I decided it would be an exciting thing to be involved with at this time.

Apple is also interested in expanding its international market. I have a lot of experience in overseas markets, I like international business and so all in all it seemed a natural thing to do.

As for taking up a No. 2 post, I don't really like to see myself as the top man, even when I was at NAS. In the business world, it is teams that win and in joining Apple I was invited onto a team. So I don't look on it as a demotion in any way; it's simply a different team.

Apple's Lisa microcomputer is aimed at a user different from Apple's traditional market. Will the marketing strategy for this product be different?

Companies don't determine distribution channels, customers do. The customers for Lisa will primarily be office personnel and so it is a different product for Apple.

Most often large companies have some sort of task force responsible for marketing strategy. In the case of Lisa, our job is to enhance the productivity of the so-called 'knowledge worker.' These customers are not going to go to the local store to buy their personal computer. Therefore, in bringing this product to the market the most important thing for us to consider is how does the potential customer want to be serviced? Obviously they want someone to come around and sell the computer to them.

What do you see as the essential issues in managing the growth of personal computers in large corporations, as they affect the role of the MIS manager?

The total issue relates to data management, programmer productivity and management control. The major concern for the MIS manager is what will happen if these personal computers, which could have a profound impact on certain aspects of a company's operations, are not properly documented.

One of the things that attracted me to Apple was that it has, in Lisa, a product which the MIS manager can feel safe in placing on the user's desk. What troubles MIS managers is that if personal computers require each user to write his own software, their efficiency as a management tool is severely restricted.

There are some people who argue that the pace of technological change in the computer industry today is such that marketing prowess takes precedence over the need to always be on the leading edge of technology. Do you subscribe to this view?

(Continued on Page 70)

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Micros Opening Doors for Nets: Geisco Head

By Lois Paul
CW Staff

ROCKVILLE, Md. — The advent of microcomputers is going to take away some of the stand-alone applications that previously were handled through time-sharing, but will also present opportunities for network transaction-oriented applications that previously would not have been computerized.

This is the view of Gregory J. Liemandt, president and chairman of the board of General Electric Information Services Co. (Geisco). It is also the reason Geisco announced in September 1982 that it was making IBM Personal Computers available to its customers through an agreement with the hardware vendor. The users can access the Geisco time-sharing network and its resident applications, as well as use the microcomputers for local processing.

"I think it is a market expander, if anything," Liemandt said of the IBM Personal Computer. "The [Personal Computer] is another way to distribute power." A time-sharing vendor can try to fight the encroachment of microcomputers and attempt to suggest that all processing should be done on mainframes, but this is a short-sighted, he said.

His feeling is that the computer services industry can bring "a lot of capability to the things that people are having the most trouble with now. When they want to use [Personal Computers] for electronic mail, to tie in their worldwide multinational company from a communication point of view, that is where we want to help them. When they want to have 100 [Personal Computers] in all of their offices all over the country entering orders and communicating with their warehouses to mortgage goods, that is where we want to help them."

Liemandt admitted that the growth in classical time-sharing is truly slowing, and the implementation of the IBM Personal Computers tied into the Geisco network is part of a move on the firm's part to become more of a computer services company than merely a time-sharing facility. He suggested that a shakeout in the time-sharing industries is inevitable.

Gregory J. Liemandt

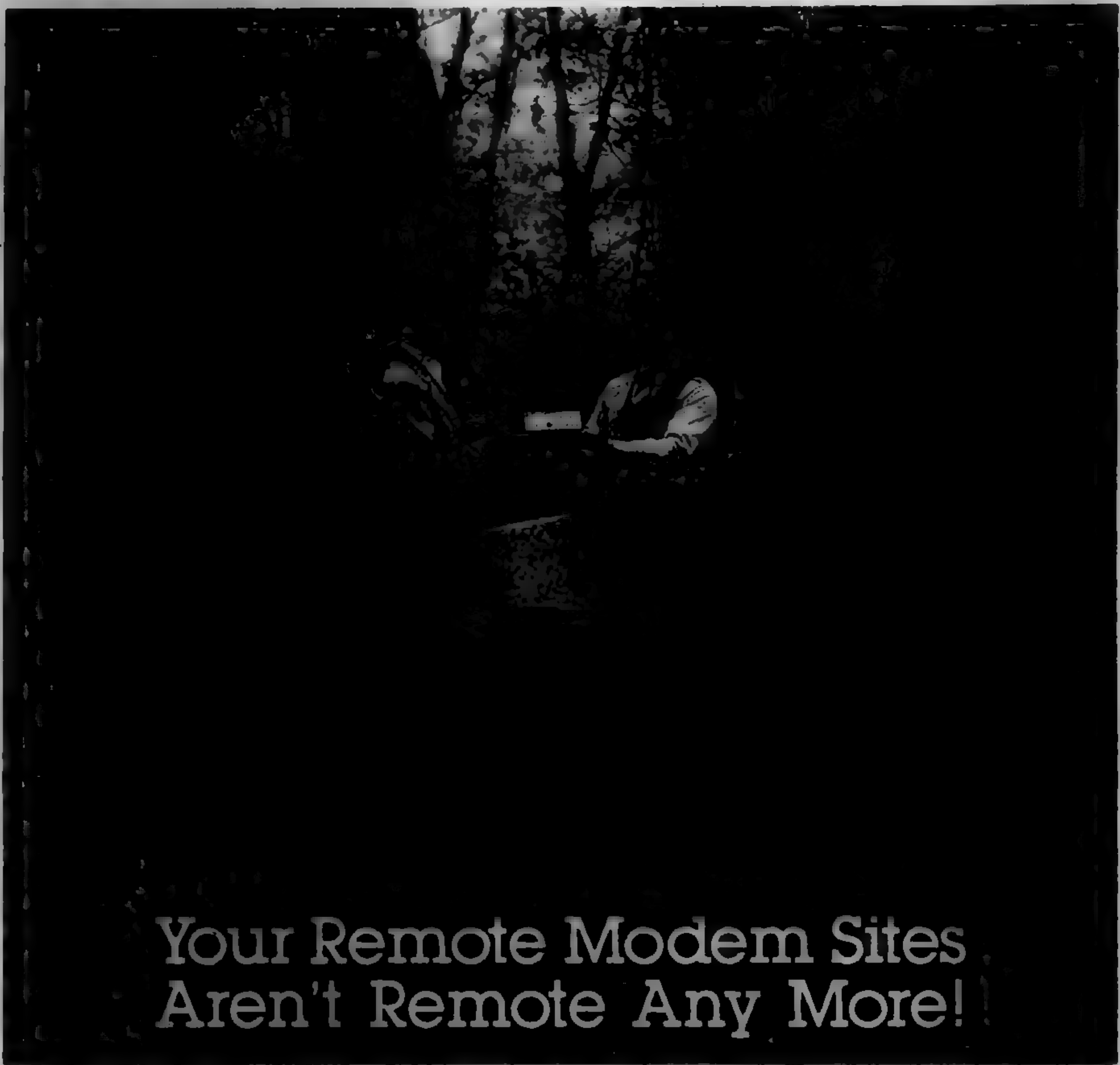
Kvamme On Tech

(Continued from Page 69)

To be successful in business you need an all-around team effort. You need skill in manufacturing, engineering, finance and marketing. Now there is no question that the company that introduces a new approach to a particular area and invents the business, so to speak, does not need to be right at the forefront of the technology.

IBM's concept of series line computers, for example, as embodied in the 360, was a new concept rather than a new technolgy. Every mainframe manufacturer has followed IBM's example ever since.

However, to the degree you are not at the technological edge, you make yourself vulnerable to competition. You have to be at the technological edge to be a major player in the market. You cannot depend on your reputation of having invented something once because that will wear off. So I disagree totally with the view that marketing is more important than technology.



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Inman Appointed President of Fledgling MCC

By Bill Laberis
CW Staff

WASHINGTON, D.C. — The steering committee of the fledgling Microelectronics and Computer Technology Corp. (MCC) has appointed as president and chief executive officer a man who served as both the deputy director of the Central Intelligence Agency and director of the National Security Agency (NSA).

With his appointment, Bobby R. Inman, 51, becomes the first bona fide employee of MCC, the joint computer technology research venture. Inman's appointment comes on the heels of the U.S. Justice Department's pronouncement that it would not challenge the formation of MCC on antitrust grounds [CW, Jan. 17].

The appointment also suggests that the companies forming MCC will follow a distinctly nationalistic bent in charting the course of the joint venture. Designed to "try to maintain U.S. preeminence and predominance in the microelectronics and computer field," MCC was the brainchild of William Norris, chairman of Control Data Corp.

No 'Corporate Experience'

A retired U.S. Navy admiral, Inman has no previous corporate experience. He served 31 years with the Navy, holding several posts, mainly in intelligence areas, according to a CDC spokesman. He resigned his CIA post last summer. Inman could not be reached at press time for comment.

"It became important for the steering committee to select a chief executive that had technological management expertise and a view of technical and national priorities," the CDC spokesman said, noting that Inman managed several DP development programs while at the NSA. "Because of his [Inman's] experience in dealing with questions about the utilization and protection of U.S. technology, he was the right man for the job . . . He understands the role electronics plays in the national and international scene."

Commenting on possible conflict of interest between Inman's work at MCC and his former government experience, the spokesman said there is no government involvement in MCC at present. However, he added, "there is a possibility of joint activity between MCC and the government at some unspecified time. For many national reasons, the government is obviously interested in what MCC will be doing."

Over the next three to six months, Inman will select a headquarters location for MCC and then recruit managers to head each of the joint venture's main programs: advanced computer architecture, software productivity, computer-aided design and manufacturing and component packaging.

The 10 companies now listed as founding shareholders are Advanced Micro Devices, Inc.; CDC; Digital Equipment Corp.; Harris Corp.; Honeywell, Inc.; Motorola, Inc.; NCR Corp.; National Semiconductor Corp.; RCA Corp.; and Sperry Univac.

DEC Reports Earnings Drop

MAYNARD, Mass. — Digital Equipment Corp.'s earnings plummeted 38% to $61 million or $1.08 per share in its second reporting quarter, while revenues rose 5% to $1.02 billion. It was the second consecutive quarterly earnings drop for the minicomputer maker and was predicted both by analysts and Kenneth Olsen, company president [CW, Nov. 15].

For the six months ending Jan. 1, DEC reported profits of $117 million, off 37% from the same period in fiscal 1982.

Revenues for the half year were up 7.6% to $1.94 billion.

The company attributed its earnings dip to depressed capital equipment markets at home and abroad and to major new investments in products, advertising and research and development. DEC officials also said they believe business will improve in the next six months, but that the earnings slide may continue, although less severely than that just reported.

Western Electric Gets AT&T Contract

BEDMINSTER, N.J. — AT&T has selected its subsidiary, Western Electric Co., from a field of six bidders as the supplier of approximately 900 miles of high-capacity fiber-optic systems for five new lightwave communications routes scheduled for service in late 1985.

Western Electric, AT&T said, offered the lowest cost, most technologically advanced system for the project, estimated to cost more than $100 million.

The lightwave systems to be supplied will initially transmit data at 432 bit/sec on a single, hair-thin fiber, with proposed system improvements expected to eventually double that capacity, AT&T announced.

Also submitting bids for the project were Fujitsu America, Inc.; Nippon Electric Co. of America, Inc.; North American Philips Corp.; Citcom Systems, Inc.; and ITT Telecommunications Corp.

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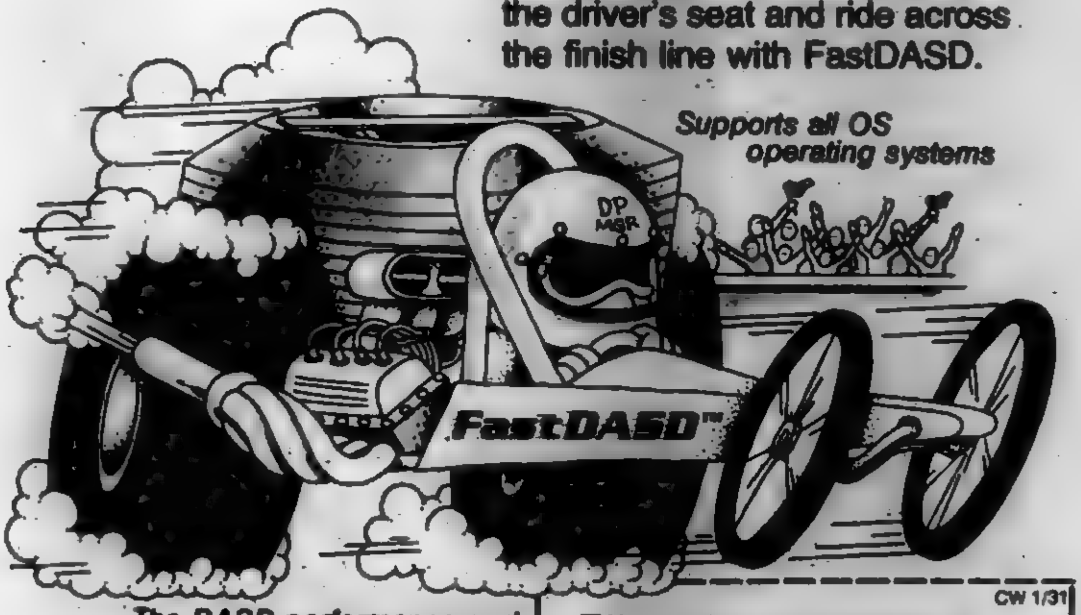

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U.S. Spends Too Much Abroad

IRS Regulation Seen Detrimental

WASHINGTON, D.C. — An Internal Revenue Service regulation on industrial research and development expenditures is forcing American firms to spend a disproportionate amount of their R&D funds abroad, where tax laws are less onerous, according to a new study.

The report, scheduled for release Feb. 1, will be used to help lobby the government for a repeal of the IRS regulation, according to the Electronic Industries Association (EIA), one of four trade associations sponsoring the Arthur Andersen & Co. study. The EIA noted that the controversial regulation has been held in abeyance since 1981 while its impact is being studied by the Treasury Department.

The study is based on a survey of 85 corporations, which accounted for more than $12 billion in corporate R&D in 1981, which was more than one third of the total $34 billion spent that year by all private industry. The survey found the IRS regulation contributed significantly to a drain of U.S. R&D funds from this country, EIA said.

The combination of the regulation's complex formula for allocating R&D expenditures among the countries where U.S. multinationals do business and foreign tax incentives is creating "an alarming shift" of U.S. funds overseas, according to the association.

IBM Forms Leasing Firm

(Continued from Page 67)

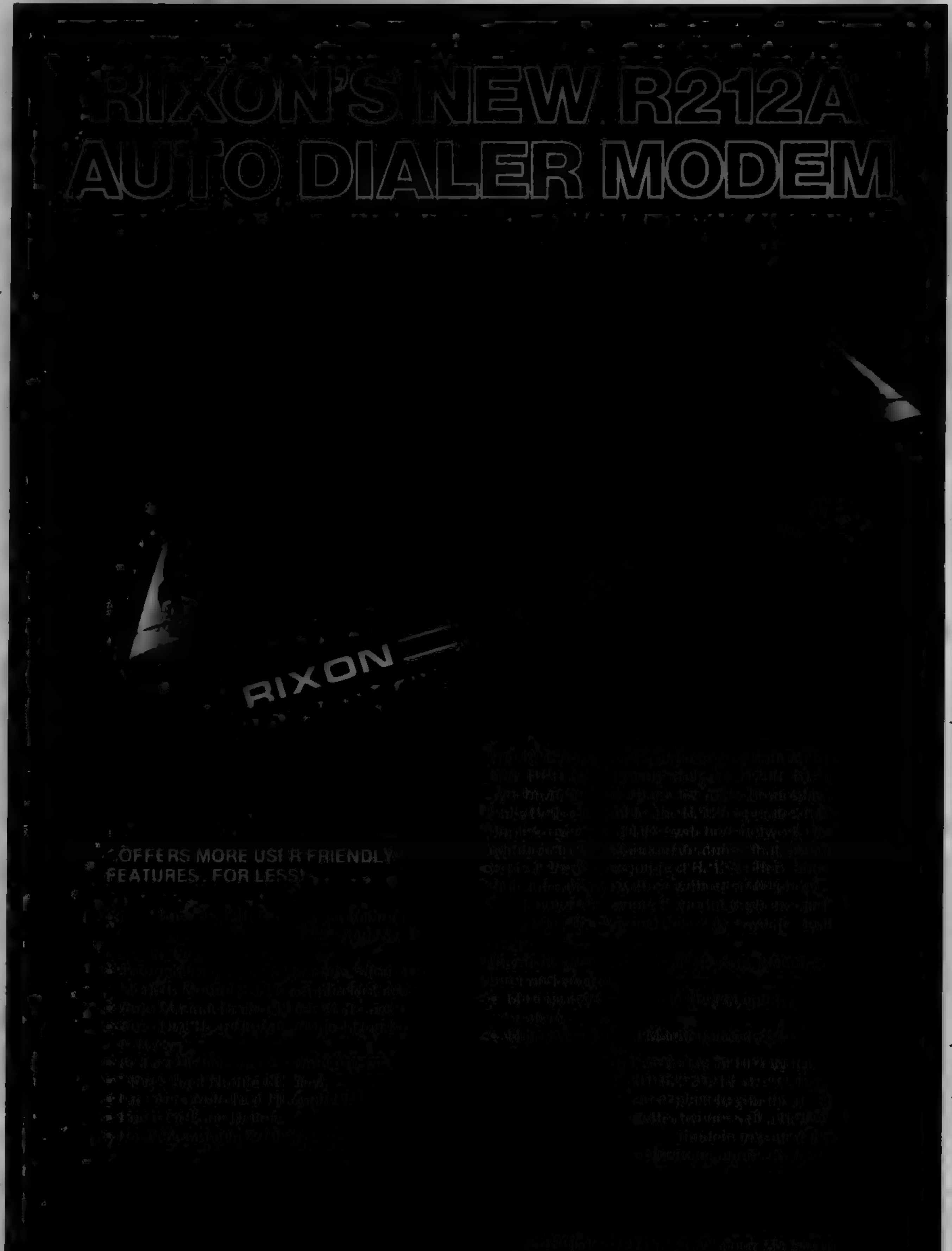
The new venture is starting business with 30 employees and is capitalized at $13 million. The president of the new firm is a former IBM Japan executive, M. Motoayashi, according to IBM.

IBM said Japan Computer Leasing Co.'s involvement is its first attempt to become directly involved in an outside leasing company. Some analysts predict IBM will also announce similar joint leasing arrangements in Europe.

In its "EDP Japan Report," International Data Corp. Japan (IDC Japan) said IBM became involved in Japan Computer Leasing Co. in an attempt to regain its position as the number one computer vendor in Japan. IBM lost that position to Fujitsu, Ltd. two years ago, according to IDC Japan.

Japan Computer Leasing Co. appears to be a counterpart to the Japan Electric Computer Co. (Jecc), a computer leasing company which was jointly established by six Japanese computer manufacturers. IDC Japan said the joint IBM venture "will undoubtedly have a great impact on the Jecc rental system," noting that about five years ago the firm was able to offer lease prices far lower than third-party leasing firms.

IDC Japan also points out that Orient Leasing has a reputation for being one of the most aggressive leasing companies in Japan. "The aggressive pricing actions taken by Orient Leasing caused much consideration by IBM Japan which had to decide whether to match Orient Leasing or bring it over to [IBM's] side."



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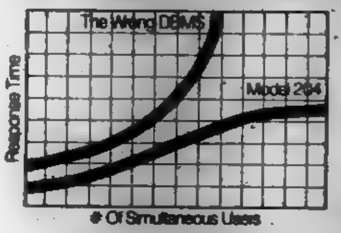

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Ungermann-Bass Agrees To Acquire Amdax Corp.

By Bruce Hoard
CW Staff

SANTA CLARA, Calif. — Baseband and broadband local-area network manufacturer Ungermann-Bass, Inc. has agreed in principle to acquire Amdax Corp., maker of broadband local networks and CATV products.

Both of the privately held firms refused to divulge details of the deal, saying only that it involves a stock transfer and there are no foreseeable impediments to its consummation. It is subject to approval by stockholders from each company.

Ralph Ungermann, president of Ungermann-Bass, which is located here, said the deal "was a very good strategic move for both companies." He cited Amdax's experience in broadband modem technology and said broadband transmission is important to his company's plans.

Ungermann touted Amdax's work in developing a high-performance host-to-host interconnect capability based on a 50M bit/sec token passing ring structure.

He said his company will utilize that technology to challenge Network Systems Corp., the preeminent mainframe-to-mainframe local-area network manufacturer, the president declared.

That work has been done at the Amdax research and development center in Boca Raton, Fla. The company has another R&D facility on Long Island, in New York.

Cablenet Discontinued

Cablenet, the general-purpose broadband local network produced by Amdax, has been discontinued. Asked if Cablenet users can expect continuing support for their systems, Ungermann replied, "We will offer Net/One as a replacement for those companies who use Cablenet."

Net/One is the name used for both Ungermann-Bass' broadband and baseband local-area networks.

Because both networks use the same coaxial cable, the transition from one to the other will be minimal, he said, adding, "there were no large Cablenet installations."

The president said Ungermann-Bass will not employ its newfound CATV capabilities to compete with Sytek Corp. for supremacy in broadband metropolitan area distribution, a goal Sytek is pursuing through its "Metronet" project.

"That market is off in the future still and one we are not strategically pursuing," he observed. Sytek is another CATV-based broadband local network manufacturer.

Like Ungermann-Bass, it combined forces with a manufacturer of CATV equipment, General Instrument Corp.

Ungermann said there will be no layoffs in conjunction with the acquisition, instead predicting "short-term hiring."

Amdax President Ivan Socher echoed Ungermann's explanation for the deal. "It was a good marriage between different technologies," he stated. "We have things that they didn't have and they have things that we didn't have in a technical sense."

Socher said "migration plans" have been worked out for each individual Cablenet user. "It's a swap-out of equipment," he said. The equipment that will have to be swapped are the bus interface units, devices that link network nodes to the coaxial cable.

Cablenet users will be given Ungermann-Bass bus interface units free of charge, he said.

Socher will stay with Amdax, working to reorganize the company by integrating overlapping R&D functions and bolstering the Amdax facility on Long Island for increased production.

Teleconferencing Equipment Sales To Swell: Studies

NEW YORK — Sales of teleconferencing equipment will top either $580 million by 1986 or $430 million by 1987, depending on which of two recently released studies are to be believed.

The number of business meetings held via various forms of teleconferencing will increase from 89,400 in 1981 to 1.8 million in 1986, according to Quantum Science Corp.'s report entitled *Teleconferencing Product Introductions Proliferate - Interactive Audio/Graphics Workstations Have Arrived.*

A total of 1,380 teleconferencing rooms will be shipped in 1986, leading to equipment revenues of $123 million, according to the study.

Sixty-six percent of those revenues, or $81.4 million, will be attributed to motion video teleconferencing rooms, the report continued.

The report is available as part of a client subscription service, which costs $10,000 from the vendor, located at 1114 Ave. of the Americas, New York, N.Y. 10036.

Videoconferencing, produced by Creative Strategies, predicts that intensifying across-the-board demand for equipment and service revenues, sparked by a greater awareness of videoconferencing time and cost savings, will dramatically expand the aggregate market at a compound annual growth rate of 59% during the next five years, with equipment and service sales topping $430 million by 1987.

Videoconferencing includes a videoconferencing implementation guide and costs $1,450 from Creative Strategies, Suite 275, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

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Calls for End to 'Scapegoating of Japan'

Brown Pushes High-Tech Policies in Senate

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Former California Gov. Jerry Brown, visiting the city he had hoped to call home for the next six years, recently appeared before the Senate Subcommittee on Savings, Pensions and Investment Policy to urge national adoption of some of California's innovative high-technology policy measures.

Brown, defeated in November in his bid for a U.S. Senate seat, called for an end to the "scapegoating of Japan" and for development of an American "bipartisan domestic economic policy" that, combined with government, business, academic and labor support, would promote development of high-technology industries and enhance U.S. competitiveness internationally.

Sen. John H. Chafee (R-R.I.), subcommittee chairman of the panel that is seeking ways to support rapid growth in high-technology industries [CW, Jan. 24], welcomed Brown's suggestions, saying, "I couldn't agree with you more. You and I are singing in the same choir."

Brown cautioned against thinking the competitive problems of U.S. business can be solved with "one statute, one technological fix," and said what is needed is "a new vision, a new consensus and a new discipline." He presented the subcommittee with documents and reports from California initiatives, including that state's commission on industrial innovation, which suggests means for promoting high-tech industries.

His formula for this effort, he said, consists of methods for making more capital available to new and established industries through government tax incentives and amended banking and pension fund investment laws that would increase the number of investment sources. Added to this, he said, is the need for improved educational systems via better pay for teachers and greater access to computers and research and training and retraining programs.

On Japan, Brown warned against protectionist measures the U.S. might adopt to fight Japanese imports, saying, "I believe Japan is being made a scapegoat for doing what we ought to be doing ourselves . . . It isn't fair for working people to be the sacrificial victims of this whole economic process," he added, explaining unemployment is largely the result of U.S. failure to develop a new industrial strategy to counter the economic slump in numerous moribund American industries.

Former California Gov. Jerry Brown seeks enhanced position for U.S.

After Taxes, Intel Cites 10% Gain

SANTA CLARA, Calif. — Intel Corp.'s pretax earnings slid 24.6% in fiscal 1982, but a lower tax rate has yielded a nearly 10% earnings gain for the year, the company reported.

Earnings totaled $30 million or 65 cents per share, up from $27 million the previous year. Revenues increased to $900 million from $788 million, a 15% annual gain. Meanwhile, fourth-quarter earnings were $8 million, up from the $4.6 million reported in the final quarter a year ago. The current figure reflects a $5.5 million tax benefit.

Gordon Moore, company chairman, said, "Our business continues to be affected by the depressed world economy and strong international competition, particularly in memory components. During the first half of the year, we experienced strong growth, and it appeared the recovery was at hand. This [was] a mirage."

DEC Announces Gift Of $1.6 Million to BU

BOSTON — Digital Equipment Corp. will donate $1.6 million in computer equipment to a $49 million science and engineering center to be built by Boston University. Included in DEC's donation will be two VAX 11-780 superminicomputers and a System 20/60.

The center project "will allow the university to consolidate its position as a major resource for New England's high-technology industries," the university said.

DEC's donation will support research in the university's College of Engineering and its newly formed Department of Computer Science.

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Exec: Future Legislation May Harm Industry

By Robert Batt
CW West Coast Bureau

PALO ALTO, Calif. — The newly convened Congress may be tempted to enact legislation that could prove harmful to the domestic computer industry.

Robert C. Kirkwood

This was the fear expressed here by Robert Kirkwood, recently appointed director of government affairs for Hewlett-Packard Co. Looking ahead to possible legislation in 1983, Kirkwood said the relative freedom from government regulation that the computer industry has enjoyed may be in jeopardy.

"As the computer industry continues to expand; it is attracting a growing body of interest from policy-makers," Kirkwood said. "Legislators are becoming concerned about regulating information as the computer industry converges towards the highly regulated communications industry. We need to understand the issues at stake, avoid the regulation of the computer industry itself and instead regulate the phenomena that govern it," he said.

Pointing to potential regulatory dangers, Kirkwood noted that government efforts to clamp down on the theft of high-technology secrets to the Soviets and Japan could get the U.S. "into a very sticky political problem. An essential ingredient for solving it will be for the computer industry to rid itself of the attitude that says 'everybody does it' [steals secrets].

"The issue of security is much broader than simple technology transfer," he continued. "It really goes to the heart of our business ethics. If we do not re-establish that ethic, the instinct of government to protect us against ourselves will be too great, although what it would do will probably be ineffective and could actually damage the industry."

For this reason, Kirkwood also pinpointed the renewal of the Export Administration Act in 1983 as crucial to the development of the computer industry. Currently a number of companies are jointly lobbying the administration and congressional officials to make ammendments to the current legislation, which expires Sept. 30.

"We acknowledge the security concerns that need to be addressed. At the same time, commercial interests should not be undermined by the legislation. In particular, we feel that the export of technology into the West should not be blocked," he said.

Kirkwood likened the current arrangements, which severely restrict the export of computer technology to the Soviet Bloc, tp the use of a club to perform a delicate operation when a scalpel would do. "There is a lot of frustration in the industry with the current regulations."

Over '81 Figures

Honeywell Earnings Up 5%

MINNEAPOLIS — Honeywell, Inc. announced a 1982 net income of $272 million, or $12.16 per share, up 5% over the previous year's earnings mark of $259 million, or $11.38 per share.

The earnings figure included $66 million in capital gains recorded earlier in the year, a spokesman for the company said.

Earnings in the fourth quarter were pegged at $88 million, down 13% from the last quarter in 1981.

Edson Spencer, company chairman, said, "The falloff in computer orders, necessitating a reduction in the size of our operations, was only partially caused by the recession, which adversely affected industries that are our major computer customers.

"In addition, the information systems market has become much more competitive and is changing rapidly as specific user applications become more apparent," he added.

"With lower backlogs and an uncertain economy, our Informatin Systems business will face another difficult year in 1983, with operating profit in the first half particularly under pressure."

The Information Systems operating profit plummeted in 1982 to $80 million, down 49% from the $158 million earned in 1981.

Memorex to Sell Intel Products

SANTA CLARA, Calif. — Intel Corp. and Memorex, a subsidiary of Burroughs Corp., have announced an agreement whereby Memorex will market Intel's solid state information storage products directly to users of IBM and IBM-compatible mainframes.

The products are high-speed, high-capacity, solid-state subsystems and will initially include the Memorex 3864, called the Fast 3825 by Intel. The terms of the agreement call for the companies to pursue joint development of new storage products.

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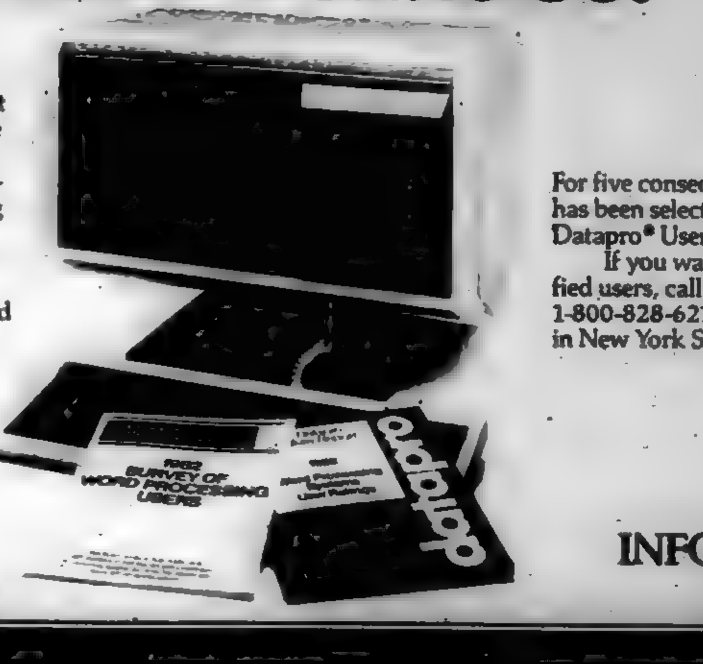

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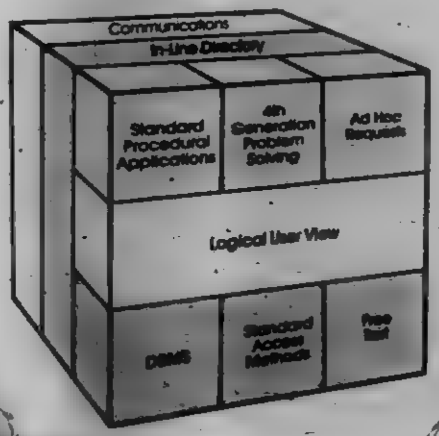

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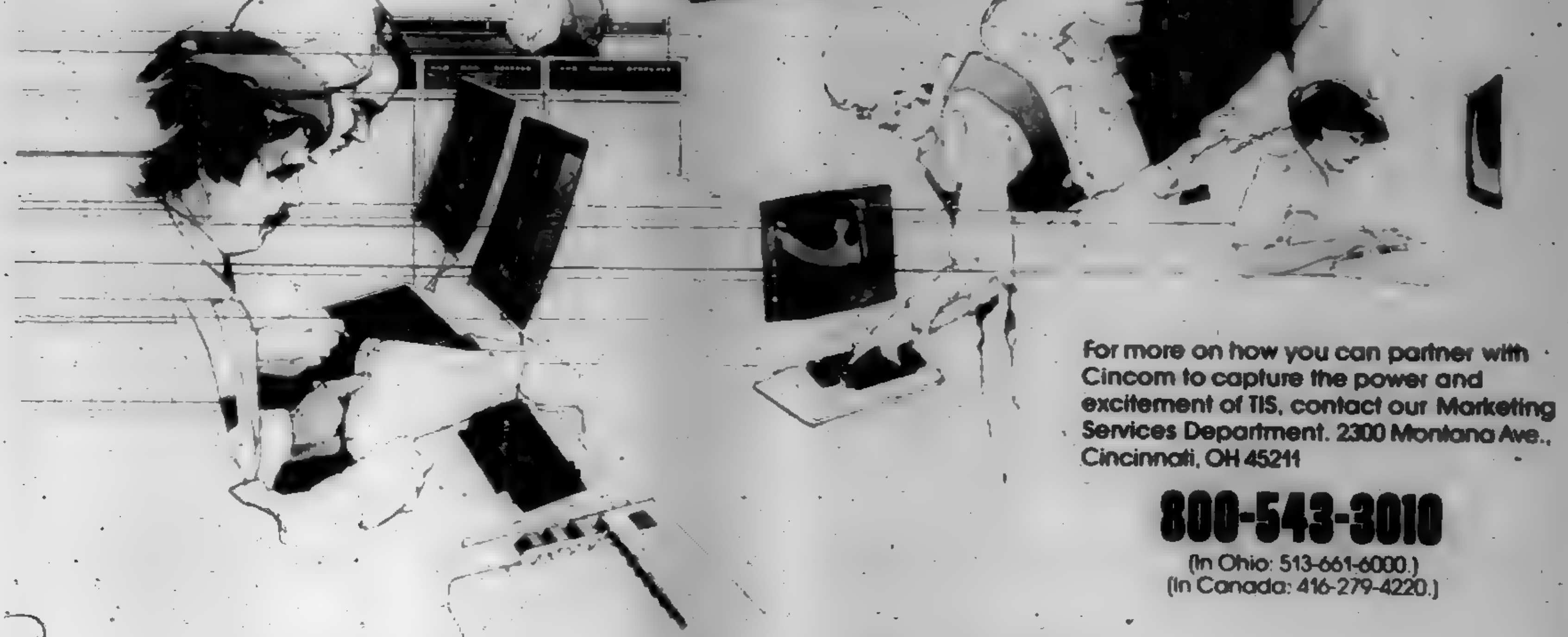

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Supershorts

Pennsylvania State University's Computer Science Department has begun two new industrial contract programs designed to allow member industries to recruit computer science graduates and to keep Penn State faculty members aware of industrial manpower needs and research interests.

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Christian Rovsing of Denmark, a supplier of computer networks and stand-alone systems has established an independent U.S. subsidiary, **CR Computer Systems**, Orange, Calif., to provide complete marketing and software support for the firm's product line. Sales offices in the San Francisco area and Houston are planned.

•

Epson America, Inc. is donating several computer systems to the National Park Service for collection and retrieval of ecosystem data at the new Santa Monica Mountains National Recreation Area.

•

Transcanada Telephone System and **American Satellite Co.** (ASC) have agreed to offer transborder satellite services to Canadian and American business customers. Private-line service including voice, data, video teleconferencing and image transfer services will be provided on both Telesat Canada's Anik satellites and the satellites used by ASC.

•

Nashua Corp. has instituted several cost-cutting measures including a worldwide 8% reduction in employees, a reduction in salaries of top management by 12% to 20% and a deferral of pay increases for both union and nonunion personnel in anticipation of losses of $30 million to $35 million for the year ending Dec. 31. The firm also expects its board of directors to approve a suspension of quarterly dividend payments at its next meeting.

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Installation and maintenance for multivendor DEC-compatible peripherals and controllers is available from **CCG Computer Services Corp.**, Costa Mesa, Calif., a newly formed subsidiary of California Computer Group, Inc.

•

Zenith Radio Corp. will produce teletext receiving equipment for Taft Broadcasting Co.'s Cincinnati teletext service under terms of what is reported to be the first such agreement between a television set manufacturer and a TV broadcaster. The five-year agreement will take effect when the Federal Communications Commission authorizes commercial broadcast teletext service in the U.S.

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Systems & Programming Resources, Inc. has formed the Strategic Resources Center in Oak Brook, Ill., through the consolidation of two Chicago sales offices and its computer services center. The new center will provide services ranging from consultation through implementation of new systems as well as upgrading of existing systems.

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Western Union has signed an agreement with Siemens Communications Systems, Inc. to provide nationwide third-party maintenance for Siemens' 4100 series of electronic message systems.

•

Tymshare, Inc. has signed a letter of intent to acquire 80% of FTC Communications, Inc. of New York, an international record carrier, from FTC Industries, Inc. FTC Industries will retain the remaining 20%.

•

Stratus Computer, Inc. and **Technology Consulting Corp. (TCC)** will jointly market Technology Consulting's point-of-sale terminal support system, Postss. TCC will provide installation, training and support while Stratus will provide hardware and system software installation, support and maintenance.

•

Microbase Corp. has formed Microbase Information Service, which will provide individualized reports to customers on products developed for the major brands of microcomputers. The reporting service begins March 28 and additional information can be obtained from P.O. Box 7459, Greenwich, Conn. 06836.

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Software Library, a rental outlet for personal computer software, has opened in Montclair, N.J. Business, educational and home entertainment packages are available and users may apply rental fees to the purchase price.

•

Terminals Unlimited, Inc. (TU), Falls Church, Va., has acquired **Savin Corp.'s** ongoing service, parts, supplies and repair business for the Savin Wordmaster 900 and Veritext 950 series. The $1 million purchase included 16 service sites and a central repair depot in Sunnyvale, Calif. TU has also acquired all of **Memorex Corp.'s** 2051 installed lease-based terminals.

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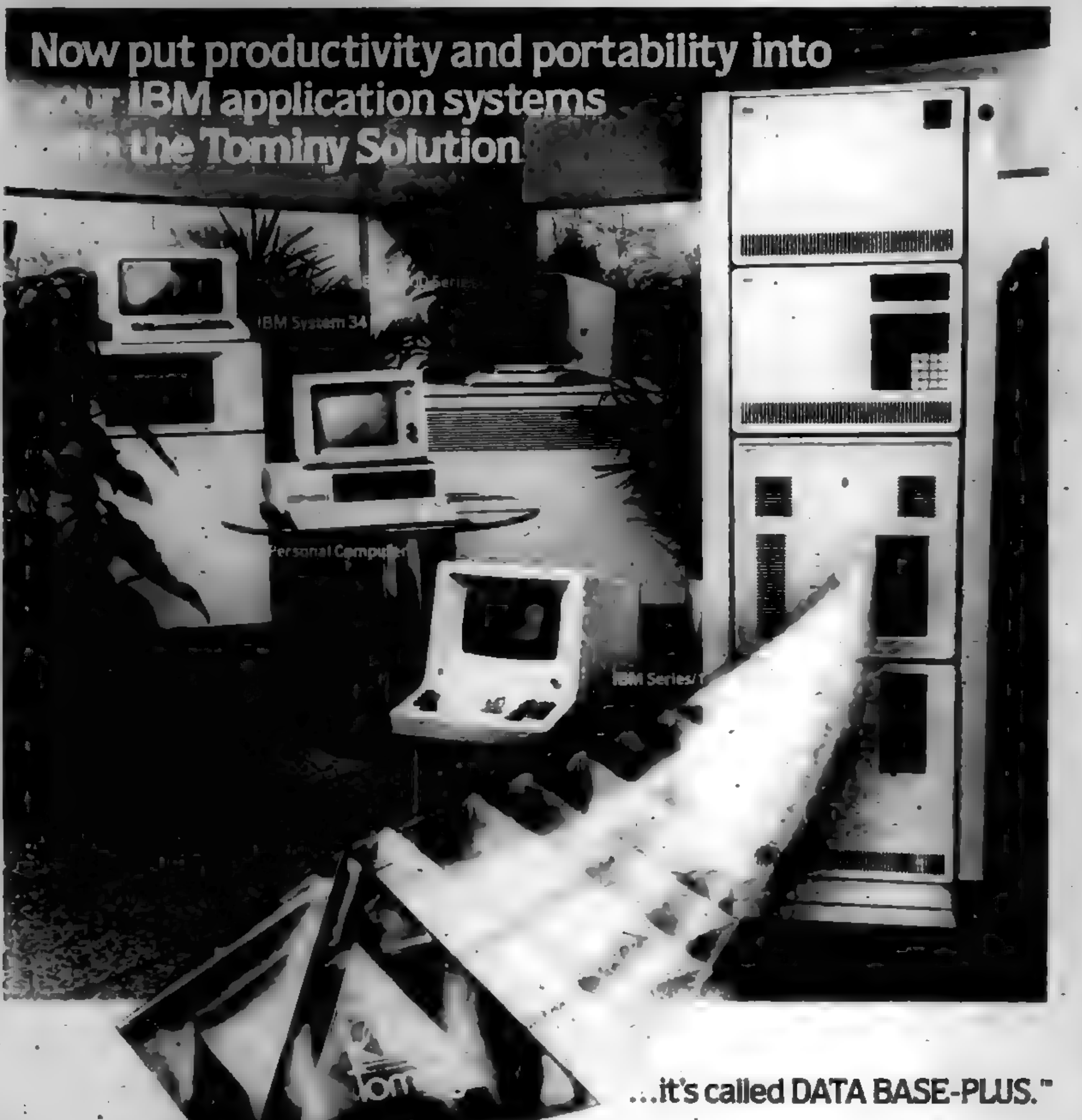
TRW, Inc.'s Customer Service Division, Fairfield, N.J., will provide full maintenance service on Hazeltine Corp.'s computer terminal products under a new, expanded agreement recently signed by the two firms.

•

Digital Research, Inc. has formed a Commercial Systems Division combining the firm's three Strategic Business Centers (SBC) — Language, Operating Systems and Graphics. Gordon Eubanks Jr., vice-president of the Language SBC, has been named vice-president and general manager of the new division.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In our new Survey, you'll get answers to these questions and much more:

Compare your salary with many others.

The new Survey not only provides salary medians for 48 position categories, but it also shows "highs" and "lows" for each one as well. Figures are organized by types of professionals, including those ranging from commercial programmers to management and marketing positions; by experience level and by size of computer installation site.

So you'll be able to compare your salary with those computer professionals who have similar responsibilities and skills and to learn who in computing, in what kinds of specialized disciplines, are earning the most.

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EDITOR-IN-CHIEF

This position requires a professional with editing experience in technical publishing and a strong backround in editorial department management. Your responsibilities will include accurate editorial content, manuscript aquisition and quality, writting headlines, directing the design of editorial pages, and meeting production deadlines. You must be bilingual (Arabic/English).

These are ground-floor opportunities for someone who wants to become part of a rapidly growing international publishing company.

To apply for either position please send resume and salary requirements to:

CW-B4079
Computerworld
Box 880
Framingham, MA 01701

Data Processing

APL PROGRAMMERS

WHITTAKER MEDICUS, the leader in applying management science and computer technology to health care institutions, is expanding the APL programming staff at our Data Center in Atlanta. These programming positions require the ability to analyze, revise and implement financial applications in the health care industry. A minimum of 3 years experience is desired and the ideal candidate will also be knowledgeable in PL1 and Assembler.

In each of the last four years, our volume has doubled and we expect to continue this trend in 1983. WHITTAKER MEDICUS provides a comprehensive benefit program and a salary commensurate with background. If you are interested in becoming a part of this hard working organization, and if you meet the above qualifications, send your resume in confidence, to:

Mr. Fred Garvin

Whittaker Medicus

1175 Peachtree Street
Suite 1602
Atlanta, Georgia 30361
Equal Opportunity Employer

Whittaker

Sr. Software Engineer

SofTech, Inc., a rapidly growing international organization active in the development and application of new systems and software technology has an immediate need for a highly skilled Senior Software Engineer to (1) design, develop and enhance software components for the Ada* Language System, such as stub generators, and automatic recompilation tools and, (2) maintain and enhance an optimizer for an Ada compiler. Minimum requirements include a Master's degree in Computer Science with emphasis in system software and compiler design, together with at least one year relevant experience in (1) the design and development of an optimizer for a high level language compiler, and (2) the coding of Ada programs. Also required is a working knowledge of the Diana intermediate language, and the VAX/VMS operating system. Starting salary is $30,000 per year for a five day, forty-hour work week and includes medical, life and disability insurance three weeks' annual vacation and other industry-competitive benefits. Qualified applicants should respond with resumes only to Ms. Judith Forsythe, Manager, Corporate Staffing, SofTech, Inc., Dept 681, 460 Totten Pond Road, Waltham, MA 02154.

affirmative action
equal opportunity employer
* TM of the DoD (AJPO)

IBM System 34

PROGRAMMER ANALYST

Pylon Company, a prominent manufacturer of mechanical test equipment for the electronics industry has an immediate opening for an IBM System 34 Programmer Analyst.

This position involves coordinating computer operations, program development, and systems design. The successful candidate will have a Bachelors degree in Business Administration or Computer Science with a minimum of 2 years related experience in System 34 operation and programming including RPG 2, DFU, SDA, SEU, OCL, and utilities and experience working with IBM MAPICS software.

If you meet the above requirements, send resume, including salary history, to:

CW-B4074, Computerworld
Box 880, Framingham, MA 01701
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SYSTEMS ENGINEERS

A large Florida-based Fortune 500 company is looking for Systems Engineers to serve as advisors and consultants in developing new technologies for both short and long term planning. If you have three to ten years of experience in the following, then you may be the person that we are looking for.

- **Systems Analysis, preferably with DBMS and/or DDP technology.**
- **Experience in planning, budgeting or project leadership.**
- **Logical and/or physical data base design.**
- **Knowledge of office and networking technology.**
- **Experience in the design of large integrated systems.**
- **Experience with Systems Network Architecture.**

Additionally, you should possess good oral and written communication skills. The company will pay for relocation costs.

For more information, call or send your resume to:

Bob Haddon
Career Development and Search Associates
Division of Cutler-Williams Inc.
2655 Villa Creek, Suite 205
Dallas, Texas 75234
(214) 484-3573
Out of state call 800-527-4907

CW

All fees are assumed by our client companies

COMPUTER SCIENCE: Department Head Position. Candidates must have the PhD in Computer Science or closely related field, be familiar with DPMA and ACM curriculum guidelines.

COMPUTER SCIENCE: Faculty position, tenure track, teaching Computer Science in areas of programming languages, computer systems, data structures and data base management systems. Background in numerical analysis, optimization techniques and discrete mathematics highly desirable. The PhD in Computer Science or a related field is preferred, Masters degree will be considered.

Significant professional competency through industrial experience, consulting, research and teaching must be demonstrated. Send resume by March 15, 1983:

School of ASET Search Committee
University of Southern Colorado
Pueblo, CO 81001
An Affirmative Action, Equal Opportunity Employer.

SR. PROGRAMMER ANALYST

Los Angeles

Work closely with client, conduct feasability studies, design specifications; code, test & debug programs. Train users & maintain system. 45 hr. week 8 am to 5 pm. $23,000 per year. College grad & 2 yrs. exp. or related exp. in programming. Can substitute 2 yrs. of exp. in lieu of each year of college. If offered employemnt, must show legal right to work. **Send a copy of this ad and resume to job #4299, POB 865, Sacramento, CA 95804 no later than February 10, 1983.**

ADMINS PROGRAMMER/ANALYST

For non-profit criminal justice agency based in NYC.
Programming experience: 2 - 3 years ADMINS required; RSX11N+ systems programming, including SYSGEN, and knowledge of COBOL, FORTRAN and/or MACRO helpful.
Salary open. Excellent benefits. Send resume and salary requirements to:

CW-B4078
Computerworld
Box 880, Framingham, MA 01701

Director of Educational Computer Center

Administer computer center, including planning and implementation of new facilities, developing and implementing budget and overseeing staff of twenty, coordinating with CUNY Computer Center (IBM / WYLBUR), college faculty and staff, vendors, and industry.

Requirements for this appointment are extensive computer experience, including telecommunications, software and programming for college-level instruction and research, and experience sufficient for appointment at salary of full professor or administrative equivalent.

Competitive salary and superior fringe benefits. Position available February 1, 1983.

Send resume to
Assistant Provost,
Baruch College, Box 514,
17 Lexington Aveue,
NYC 10010.

Baruch College

The City University of New York

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MAS

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Fees and relocation expenses company paid.

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Many things fly, maneuver and run on software at Kearfott.

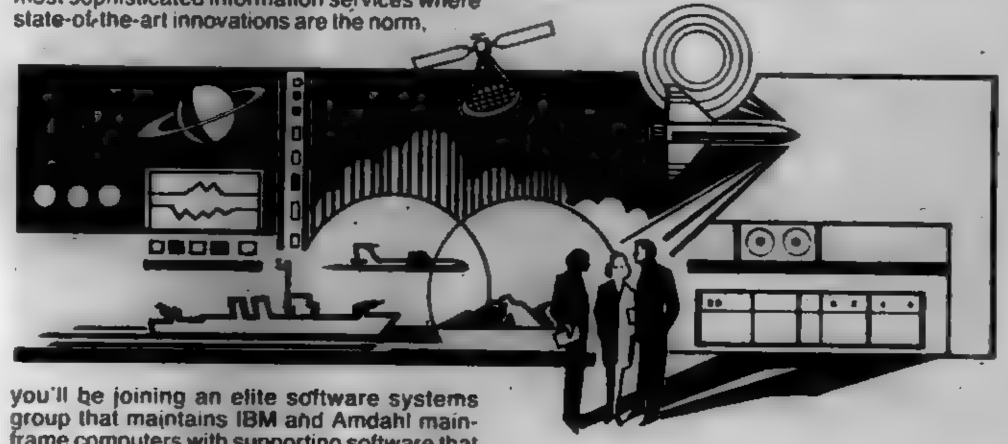
Including careers.

Whatever your software specialty, you have a choice of career paths at Kearfott—in operating systems…commercial applications…and computer software engineering. Right now we're engaged in many of the most difficult, stimulating, and ultimately rewarding technological undertakings imaginable. And all of our dozens of on-going projects depend on strategic software advances in communications, logistics, MIS and guidance systems.

At our Data Center, one of the country's most sophisticated information services where state-of-the-art innovations are the norm, you'll be joining an elite software systems group that maintains IBM and Amdahl mainframe computers with supporting software that includes MVS/SE-2, SE/A, JES 2, IMS DB/DC, CICS, TSO, WYLBUR, ACF/VTAM, ACF/NCP, SAS, information systems. This Center is tied in to all our plants via an on-line computer and provides an instant interchange of technical data. Here you'll have the opportunity to develop user-friendly software and become involved with educating company users and consulting on, and resolving, daily problems.

In MIS—the expanding sphere that has helped give Kearfott's rarefied environment a very solid basis—you'll run the gamut. Accounting. Finance. Payroll. Inventory and manufacturing controls. All involve COBOL programming, CICS, MVS, IMS, and data base design and Telecommunications.

Software engineering offers yet another challenge. Have strengths in realtime software development? Simulation or validation techniques? Firmware and microprocessors? Kalman filtering? Fortran, JOVIAL or Ada compilers? Let us tell you about our variety of minicomputer projects and resources.



The path of the future for software professionals can begin with Kearfott if you have the minimum of 3 years experience that we require in a large-scale IBM system, with HP, DEC, or airborne minicomputers or microcomputers in realtime military systems.

Find out why software careers fly higher at Kearfott by sending your resume to: Carol Batte, Singer Company, Kearfott Division, 1150 McBride Avenue, Little Falls, NJ 07424.

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TEXAS A&M UNIVERSITY
DIRECTOR OF ADMINISTRATIVE DATA PROCESSING

Texas A&M Univeraity invites applications and nominations for the position of Director of Administrative Data Processing. Texas A&M University, located between Dallas and Houston is a state supported land grant institution with approximately 36,000 students.

Description of Position: The Director reports directly to the Vice President for Fiscal Affairs and has responsibility for the operation of a large scale computing center equipped with linked Amdahl 470 V-6II and 470 V-8 computers using MVS/JES3 operating and IMS data base/data communication systems. The Center has a staff of 106 employees and is directly responsible for administrative applications, development and support as well as the operation of a large local network and a statewide network serving other educational institutions and state agencies.

Qualifications: Candidates must have a significant record of achievement in administration and planning including at least five years experience in a large-scale computing operation preferably in higher education. An advanced degree is preferred. In evaluating the candidate particular attention will be given to previous achievements which give evidence of:

- Knowlege of universities as a unique management setting
- Ability to foster cooperation in administrative operations
- Skill in applying automation to improve organization of productivity

Salary: Open and Competitive

Availability: Position will be filled by July 1, 1983.

Nominations or applications including a resume and four references should be sent by March 10, 1983 to:

Mr. Robert Smith,
Assistant Vice President for Fiscal Affairs and Controller
Chair, Search Committee
Texas A&M University
Coke Building
College Station, Texas 77843

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1983 DP CAREERS

Now is the right time to consider new career opportunities. Many corporations are seeking Professionals with a variety of systems experience. All are Sunbelt based.

- **DIR MIS** [illegible] + bonus pkg.
Corporate level position responsible for sys. dev., opns., tech support, data base admin. and comm.
- **MGR DISTRIBUTION SYS** [illegible] + bonus
Develop distribution system for major retail corporation. Mini and supervisory exp. preferred.
- **DATA BASE ADMINISTRATION** [illegible]
Supervisory exp., min 5 yrs. IMS DB/DC exp.
- **MANAGER FINANCIAL SYSTEMS** [illegible]
Develop financial applications for major mfg. firm.
- **PROJECT MANAGER** [illegible]
Requires extensive user contact plus some travel.
- **PERFORMANCE ANALYST** [illegible]
Sys. tuning, capacity planning in multi CPU IMS DB/DC env.
- **COMPUTER ANALYST** [illegible]
Strong tech. skills plus good applications exp.

These are only a few opptys that currently exist. We also have many requirements for programmers, programmer analysts, and tech. analysts with OS/MVS, DOS/VSE, IMS DB/DC and CICS experience.

ALL FEES PAID BY CLIENT COMPANIES
Contact: Larry Stone or Jimmy Buck
704/375-0600

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SENIOR SOFTWARE ENGINEERS

This position requires experience with Microprocessor Assembly and high level structure languages applied to real time graphics. Equivalent of 5+ years experience and a BSCS/BSEE preferred. Responsibilities involve software analysis, design, and coding for video game systems.

We are the maker of ColecoVision and the Pac-Man portable table top arcade games, and our extraordinary growth in consumer electronics provides superior career growth potential. Attractive compensation and benefits package.

Send resume with salary requirements in confidence to:
JOYCE MENDOZA, Technical Recruiter

HUMAN RESOURCES DEPARTMENT

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WALT DISNEY WORLD CO. CAREER OPPORTUNITIES

WALT DISNEY WORLD CO., currently undergoing a tremendous expansion with the recent opening of EPCOT Center, has immediate openings in the following areas:

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Requires a B.S. in Computer Science or Math. An M.B.A. is preferable. Ten years' Data Communications or Telecommunications with five years' management experience required. Good technical Data Communications skills essential.

PROGRAMMER ANALYSTS

Innovative Programmer Analysts with 2 - 5 years' recent system development experience on large scale business computers are needed to take an active role in the design of batch and online business systems using COBOL as primary language.

DATA PROCESSING OPERATIONS MANAGER

Qualified applicants will possess a college degree, preferably in Computer Science with 6 - 8 years' Computer Operations management. Experience with a medium to large UNIVAC 1100 installation is required. "A people-oriented" professional with good verbal and written communication skills is essential.

REALTIME PROGRAMMERS

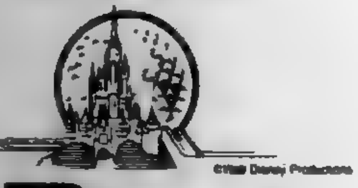
Strong recent experience in system design and development with emphasis on Microprocessor Control Systems along with being proficient in Assembly Language, Pascal and C on INTEL. Experience on DEC, SPERRY UNIVAC MICROPROCESSOR and Hewlett Packard Mini Computers. A degree in Engineering or related technical discipline is required.

EDP AUDITORS

Our Corporate Management Audit Department has immediate openings in California and Florida for EDP Staff Auditors. Qualified individuals must have a B.S. in Accounting, or Computer Science, and must have a minimum of 2 - 3 years' experience as an EDP Auditor, preferably in a public accounting setting. Familiarity with UNIVAC 90/80 or 1100 Series machines is desired.

Qualified applicants should send resume and salary history, in confidence to:

WALT DISNEY WORLD CO.
Professional Staffing MIS-2
P.O. Box 40
Lake Buena Vista, FL 32830



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AUSTRALIA

ROYAL MELBOURNE INSTITUTE OF TECHNOLOGY LIMITED SENIOR LECTURER/LECTURER DEPARTMENT OF COMPUTING

The department offers a broad teaching programme in Computer Science. Major current research activities include: data base management, computer hardware and software architecture, computer data communications, compiler construction and artificial intelligence. The Institute supports interaction with industry through consultancy and education.

Applicants should have an appropriate tertiary qualification and experience in two or more of the following areas (alphabetical order): artificial intelligence, commercial computer applications, computer architecture, computer based data communications, computer graphics, computer hardware, computer networks, control systems, digital logic, operating systems, real-time applications programming, robotics, scientific mathematical, engineering applications, software engineering, systems analysis and design.

Salary within the ranges:

Senior Lecturer	**$A30,000 - 35,077 per annum**
Lecturer	**$A22,430 - 29,467 per annum**

The position is tenured.

Position description available from Staff Branch, RMIT Ltd., Box 2476V, GPO Melbourne 3001, Australia.

Applications quoting reference number 128/18/AN to Staff Officer at above address by March 18th, 1983.

RECON CENTER MANAGER

Excellent opportunity for a qualified individual to set up manage recon/refurb center.

Area of responsibility is general office management including audits, inventory control and all facets of recon/refurb. Familiarity with payroll and general accounting functions is highly desired.

The successful candidate will have 5 years' industry experience and strong knowledge of IBM I.O., CRT's, 4300, System 3 and Series I in addition to experience with billing procedures and IBM M/A policy. The candidate we seek will have earned a minimum of $30K annually for the past two years.

Salary is open. Incentives plus excellent benefit package.

For consideration, qualified individuals may submit resume, outlining salary history, to:

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Computerworld
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Framingham, MA 01701

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R&D opportunities at their finest with BTI COMPUTER SYSTEMS ON THE SAN FRANCISCO PENINSULA, manufacturers of the BTI 8000, a 32-bit multiprocessor system featuring multiple languages, remote diagnostics & modular expandability.

SOFTWARE DEVELOPMENT ENGINEERS

Be part of a small, highly talented group of industry professionals and contribute to a major software project — enhancement of our 32-bit multiprocessor computer system — and be on board for the highly visible challenge of future product development. Choose your specific area of development:

- **OPERATING SYSTEMS** and related programs requiring familiarity with high level and Assembler languages.
- **DATA COMMUNICATIONS** requiring a thorough working knowledge of asynchronous protocols & line drivers. Assembler langage experience required.
- **FILE MANAGEMENT** development of Data Dictionary, Query/Report & Recovery modules requiring experience in ISAM or DBMS. Knowledge of PASCAL desirable.

These positions all require a related BS/MS or equiv. and 2 or more yrs. directly related industry experience.

BTI offers a competitive salary & benefits package, flexible working hours, 34 paid days off each year, an informal working environment and much more. For immediate consideration, please send resume to B. Hailey, BTI COMPUTER SYSTEMS, 870 W. Maude Ave., Sunnyvale, CA 94086, (408) 733-1122. An equal opportunity employer.

BTI COMPUTER SYSTEMS

JANUARY 24, 1983
POSITIONS: TWO INSTRUCTORS IN DATA PROCESSING.

9 Month Position. One beginning March 1, 1983 and one beginning Sept. 1, 1983. Summer Teaching Opportunities Available.

COLLEGE: Nestled in the scenic foothills of the Blue Ridge Mountains midway between Greensboro, NC and Roanoke, VA, Patrick Henry Community College is a comprehensive two year college serving the City of Martinsville, Henry and Patrick Counties, and portions of Franklin County. The service region is highly industrialized in both furniture and textiles and has a population of approximately 100,000. There are numerous recreational opportunities including nearby Smith Mountain Lake and Fairystone State Park. The College is dedicated to academic excellence in both the College parallel and occupational/technical curricula. An occupational/technical building has been approved for construction and will house a new, modern data processing lab designed solely for instruction.

DUTIES: Teach courses in two year Diploma in Data Processing and one year Certificate in Computer Operations curricula. Courses include flowcharting, computer programming in RPG, COBOL, ASSEMBLER and FORTRAN, computer operations, computer programming logic, and systems analysis. Responsibilities will also include office hours, academic advising, and committee activities. Teaching assignments may include day, evening, and off campus classes.

QUALIFICATIONS: Minimum Bachelor's Degree and two years related occupational experience. Salary is dependent upon qualifications and experience.

Applications must include an official college application form, resume, and college transcripts. Applications and information may be obtained from and returned to:

Personnel Office
PATRICK HENRY COMMUNITY COLLEGE
P.O. Drawer 5311
Martinsville, VA 24115
Tel. 703-638-8777 x206.

Applications must be received or postmarked no later than February 18, 1983 for March 1 position and April 30, 1983 for September 1 position.

An Affirmative Action/EOE

SENIOR PROGRAMMER/ANALYST HP-3000

Major midtown NYC communications company requires a Senior Programmer Analyst with Systems Analyst potential to lead 1983 conversion from a COBOL batch environment to an HP-3000 on line configuration including implementation of Software International packages. Three years applicable experience required. COBOL, IMAGE, QUERY and Financial application experience highly desirable. Salary competitive dependent on qualifications, excellent benefits including Profit Sharing. Confidentiality assured. Forward resume with salary history to:

CW-B4076
Computerworld
Box 880 Framingham, MA 01701

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SYSTEM ANALYST

Large local mfg. is expanding their DP dept. Excellent growth oppty. for the indiv. with IBM, COBOL, or PL/1. Move up.

Salary $25-27K

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Lic. DAPC Member

Oak Park, IL (54,887).
Police-Management Information Systems Supervisor
$22,000-$29,000.

Responsible technical and administrative work in supervising the Police Record Bureau and developing and maintaining an automated Management Information Systems. Conduct systems analysis, oversee mandated reports. Basic familiarity with computer hardware and software required. Graduation from college with training and experience in statistics, accounting and data processing. **Resume to Personnel Director, Village of Oak Park, 1 Village Hall Plaza, Oak Park, IL 60302.**

UT Martin

Applications are invited for one computer science and one half computer science/half math position, tenure track, begin Sept. 83. Computer information science or math with computer emphasis is preferred. M.S. with demonstrated ability to teach & plans to complete a terminal degree will be considered. Salary dependent upon qualifications. Primary responsibility will be teaching 12 qtr hours of undergraduate courses, academic advising of students, and curriculum development. Computing facilities include PDP 11/70's, several micros, and remote entry to IBM 3031 and DEC 10 at UT Knoxville. Send by March 1 1983 resume, transcripts, and 3 letters of reference to Dr. **Bill Austin, Dept of Mathematics and Computer Science, The University of TN at Martin, Martin, TN 38238-5040.** Representative will be at ACM conference in Orlando. UTM is an equal opportunity/affirmative action employer.

VERMONT INFORMATION SYSTEMS ANALYST

A career growth opportunity exists for a Systems Analyst to design and develop financial aid administrative systems. This newly created position offers challenging work in a good environment and requires excellent analytical and communication skills. Relevant work experience on smaller IBM systems such as System 34 or System 38 is desirable. Bachelor's Degree required. Master's preferred. Excellent salary and benefits. Please forward resume with qualifications to:

Information Systems Analyst
Vermont Student Assistance Corp.
P.O. Box 2000, Champlain Mill
Winooski, VT 05404

COMPUTER SCIENTIST

with Industrial Engineering background. Duties include using MTM, methods improvement, economic justification, cost reduction, line balance, man power planning and labor efficiency. Primary focus on automating plant functions. Programming languages COBOL, BASIC and ASM. Must possess MS Computer Science with BS Industrial Engineering or equivalent training and at least one year of related job experience. 40 hours/week. $20,000/annual. Equal Opportunity Employer. **Send resume to ARK Employment Security Division, P.O. Box 34047, Little Rock, Arkansas 72203.**

ILLINOIS STATE UNIVERSITY
Information Systems/Computer Applications

Tenure track faculty positions for Aug. 83 in an **information systems-computer applications** program. Areas: All considered. Special interest in structured analysis and design, online systems, data comm., software engineering. Qual.: PhD and computer experience or MS and industry experience. Commitment to teaching and application driven research. Ability to relate to application areas (esp. Business, Education, Math) desired. **Closing date: March 15, 1983 or when positions are filled. Contact: Dr. M. Powers, Chm, Applied Computer Science Department, Illinois State University, Normal, IL 61761.**

Equal Opportunity/Affirmative Action University

SYSTEMS PROGRAMMERS
$25K to $50K
PROGRAMMERS/ANALYSTS

Familiarity with any of the following:

- PL/M, PL/Z, PASCAL, UNIX/C or CP/M operating systems. 2-8 yrs exp. Degreed.
- Install & maintain UNIX, DEC & 3rd party software. Analyze & improve VAX performance.
- Mathematical modeling. Software development.
- Minis/Micros. Real Time controls.
- Software Dev'lt. Exp. in applications dev'lt utilizing UNIX-C.
- Robotics & process machine control.
- Write software graphic packages.

This is a partial list of more than 1000 current openings we have listed with us. Fees & relocation expenses company-paid. Call/send resume. DEPT. C-B

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BAL, FCL, 3600, ATM's	To 28K
OS, MVS, PL/1, Cobol	To 27K
Univac 1100, Assembler	To 28K
DOS or OS, trust, deposits, credit card, check processing, savings, loans	To 30K
CICS (Macro Bat & Command)	To 32K

SOFTWARE PROGRAMMERS

MVS, VSE, VM, CICS	To 33K
IMS DB/DC, ACF, VTAM	To 33K
IMS Data Base Analyst	To 32K

Call or send resume.
Other positions available.

[illegible] AVAILABILITY, INC. [illegible]

COMPUTER GRAPHICS

Key product management opportunity at SOHIO's Scientific Computing Facility

If your experience encompasses highly sophisticated graphics applications, your next career step could be The Standard Oil Company (Ohio). Our Cleveland Scientific Computing Facility features CDC Cyber 175, 760 and 205 gear, and uses major graphics software packages — **DI-3000, MOVIE. BYU, CPS-1, SGL/SDL and CD-2000.**

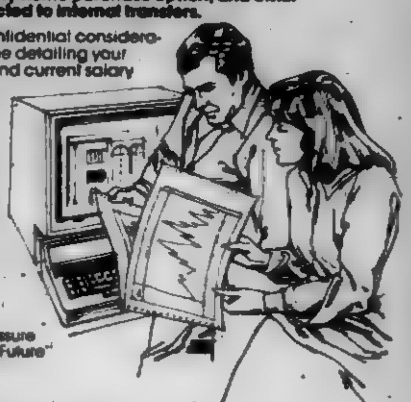
We are actively seeking a technically skilled computer graphics specialist to be part of our growth activities associated with graphics software product management. Your qualifications must include:

- **BS degree in a technical field, preferably with an MS in Computer Science (or related technical area), and work experience on a CDC Cyber 175 and/or 760 using major graphics software packages mentioned above.**
- **Demonstrated ability to consult with minimal supervision in a highly dynamic environment.**
- **4-6 years' practical experience with various computer graphics terminals and software, preferably petroleum engineering- or exploration-related.**
- **Excellent oral/written communication skills and the ability to work effectively with senior technical and managerial people as well as graphics users.**

As our Computer Graphics Product Manager, you would maintain state-of-the-art knowledge of graphics software and hardware technology to provide ongoing consulting support to SOHIO's diverse graphics user community. You would also have complete responsibility for the rapidly expanding graphics products library on our CDC Cyber computers.

We offer an excellent salary commensurate with experience, comprehensive benefits and an opportunity to work with some of the industry's most advanced technical people in an environment of teamwork and individual growth. **SOHIO's relocation package for new hires who are homeowners includes a mortgage interest differential allowance, third party home purchase option, and other features often restricted to internal transfers.**

For immediate, confidential consideration, send your resume detailing your career experience and current salary history to:



Sarah Steiner,
Senior Executive
Recruiter
THE STANDARD OIL COMPANY (Ohio)
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— 482 (CW)
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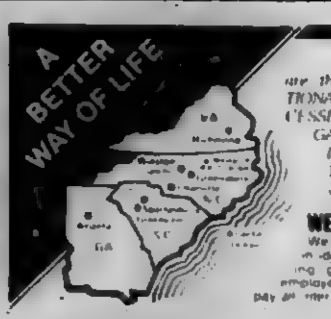

OUR CLIENTS

are the leading NATIONAL and INTERNATIONAL corporations with major DATA PROCESSING CENTERS in NC SC So VA No GA. They offer state of the art TECHNOLOGY, excellent WORKING CONDITIONS, outstanding FRINGE BENEFITS and nationally COMPETITIVE SALARIES

WE ARE PROFESSIONAL RECRUITERS

We are paid by our company clients to assist them in identifying the talent required for their continuing growth. Your presentation to a potential employer is personal and confidential. Our clients pay all interview and relocation expenses.

SYSTEMS DESIGN MANAGER to $40K
4 yr degree (MBA a plus). Min. 10 yrs exp in systems analysis and design of business systems utilizing data base and telecommunications technology in a large IBM mainframe environment.

SR. TECH ANALYST to $30K
Min. 2 years in MVS performance monitoring and tuning with thorough knowledge of MVS generation and maintenance. Experience with IMS, VM and capacity planning a definite plus.

SOFTWARE ENGINEER to $30K
BSEE. Min. 4 years experience in software design of commercial applications for microprocessor based products. Familiar with software/hardware tradeoffs, layered systems architecture, operating systems definition, Assembler and Pascal coding.

SYSTEMS SALES REPRESENTATIVE to $30K
MBA (undergrad degree in engineering or physical science preferred). Min. 5 yrs exp in sale of microprocessor based industrial equipment or for fleet management service bureau required. Ability to write and make proposals.

PROGRAMMING MANAGER to $30K
4 yr degree. Min. 10 yrs in management of financial systems development in a medium to large scale IBM mainframe environment. Strong COBOL programming and DOS/VSE background.

COMPUTER ANALYST to $33K
College degree. Min. 5 yrs in large mainframe IBM OS/MVS environment. Must have strong background in business systems design, COBOL programming, IMS DB/DC data dictionary, methodology and standards.

LEAD SYSTEMS ANALYST to $33K
Computer Science degree preferred. Min. 8 yrs DP exp. with 3 yrs COMMERCIAL & INSTALLMENT LOAN and 2 yrs project/people management experience in large mainframe IBM OS or MVS environment required.

SYSTEMS ANALYST to $28K
Min. 5 yrs in systems analysis and design of business systems in large mainframe IBM environment. Oral and written communications skills.

ANALYST/PROGRAMMER to $30K
College degree. Min. 3 yrs in systems design and programming of process control or manufacturing systems in FORTRAN and/or COBOL on DEC PDP 11 or VAX computers.

ANALYST/PROGRAMMER to $22K
Min. 3 yrs in analysis, design and COBOL programming of business systems in large mainframe IBM environment. Familiarity with OS/JCL, VSAM, CICS, DL/I or IMS a must.

PROGRAMMERS to $20K
Min. 3 yrs exp. programming in COBOL utilizing OS/JCL, VSAM, CICS. Familiarity with DMS or Data base systems a plus.

ANALYST/PROGRAMMER to $26K
Min. 3 yrs exp. in design and programming (COBOL) of manufacturing applications. Univac 90 series, UMS experience a plus.

OPERATIONS SUPERVISOR to $30K
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Send resumes to:

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Fort Lee Executive Park
Two Executive Drive
Fort Lee, New Jersey 07024
Attn: Technical Hiring Team

(201) 592-0009 / (800) 526-0272

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AUXCO a prestigious and progressive software proprietor and consulting organization specializing in the telephone communications industry currently has several immediate opportunities for professionals possessing the following background

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Candidates MUST possess solid leadership experience with technical background in COBOL IMS or PL/1 IMS

• CICS Programmer/Analysts

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Solid working experience designing DB/DC based systems. Candidates should be familiar with COBOL and/or PL/1 in an IMS Database environment

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The qualified applicant will have technical understanding of large scale hardware and software computer systems and communication networks. Must have recent experience in MVS enviroment at the current level of hardware/software technology. Experience required in computer performance measurement forecasting using such aids as RMS/SMF, SAS and Modeling. Good written and verbal communication skills are an intergral part of the position. Proven record in Capacity Planning and prior Systems Programming would be the ideal background for this position.

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SENIOR TELEPROCESSING SYSTEMS PROGRAMMER

The International Atomic Energy Agency, an organization in the UN family, seeks a highly experienced Senior Systems Programmer as Teleprocessing Expert for its Computer Services Section - Systems Group. Required university degree plus 10 years' relevant practical experience in data processing or 15 years' relevant practical experience in data processing, of which, in both instances, 5 years must be recent systems programming experience in a large IBM MVS environment and experience with TSO and CICS. Some working experience in technical project management, current telecommunication technology, computer architecture and programming languages are also prerequisites.

Presently, the Agency has a dual IBM 3081/3032 MVS/SP plus JES2 configuration with ACF/VTAM, TSO/SPF, CICS, STAIRS and ADABAS and provides a variety of computer services to the UN organizations based in Vienna, as well as world-wide networks for information retrieval.

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Send Curriculum Vitae with an indication of your nationality under Vacancy Notice No. 4/83 to the Division of Personnel, International Atomic Energy Agency, P.O. Box 100, A-1400 Vienna, Austria.

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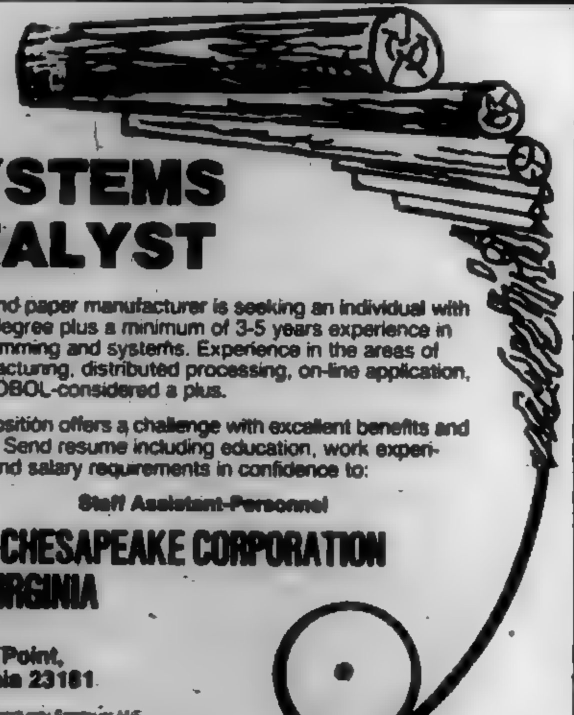

SYSTEMS ANALYST

Pulp and paper manufacturer is seeking an individual with a BS degree plus a minimum of 3-5 years experience in programming and systems. Experience in the areas of manufacturing, distributed processing, on-line application, and COBOL-considered a plus.

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PROGRAMMER/ANALYST

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PROGRAMMER

Vinnell Corporation, an international technical services contractor, seeks a programmer with a minimum of 2 years experience with RPG and COBOL in an online data base environment. IBM/System/38 experience highly desirable.

For more information about this challenging opportunity, please send your resume including salary history and requirements to Rick Kraft, Vinnell Transportation Center, 222 E. Redwood Street, Baltimore, Maryland 21202.

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In addition to being a part of a successful enterprise, you will qualify for a compensation package including a highly competitive salary and excellent employee benefits. Qualified individuals will have access to our transfer policy which offers new hires many features that other firms reserve only for transferring executives. Please respond by sending a detailed resume to H.R., Sohio Petroleum Company, R7160, 633 17th St., Suite 2200, Denver, CO 80202. Preference will be given to resumes sent by individuals while those referred by employment agencies will be held for later review.

SOHIO

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Department 131
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It's Middle South Services, Inc., the specialized technical service arm of the Middle South Utilities System. We're the sixth largest electric utility in the nation, applying the latest innovations in energy throughout portions of Louisiana, Arkansas, Mississippi and Missouri. The ongoing success of network is contingent upon the sophisticated systems support of our advanced EDP environment.

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Working with user personnel, you'll determine information requirements and operational needs, as well as aid in planning, defining, analyzing and implementing business systems. Requires 2+ years experience as a Systems Analyst along with a thorough understanding of the logical design in IMS DB/DC. Knowledge of ADF, Data Dictionary concepts, Mark IV, Panvalet would be a plus.

ANALYST PROGRAMMERS

The ideal candidates would possess 3+ years experience with COBOL, IMS DB/DC, plus 3 years experience with Business Applications or plant maintenance systems. Knowledge of ADF, Data Dictionary concepts, Mark IV, Panvalet would be a plus.

ANALYST PROGRAMMERS (SCIENTIFIC/PLANNING)

Positions calls for an individual capable of developing information systems specifications, as well as estimating, coding, testing and documenting scientific/planning oriented computer problems. You must possess knowledge of COBOL and CLIST. Experience with a variety of modeling applications helpful. Knowledge of FORTRAN and/or PL1 a plus.

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Openings exist in the General Accounting and Financial areas for experienced Project Leaders.

The FINANCIAL PROJECT LEADER position calls for an individual with a background as a Senior Systems Analyst and/or Project Leader Administrative/Accounting Systems such as accounts payable. Technical background in a IBM environment with large system maintenance responsibility is required; formal study in accounting principles is desirable. PL1 and IMS experience helpful, though not required.

THE GENERAL ACCOUNTING PROJECT LEADER position requires a background in maintaining and developing large general ledger systems in a Senior Systems Analyst or Project Leader capacity. Technical background should include large systems maintenance in a IBM environment which utilized PL1 language. Coursework in finance/accounting highly desirable.

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Your responsibilities may include planning, designing, and coordinating the implementation of our data communications network; installing and maintaining data communications program products, e.g. ACF/NCP, ACF/VTAM; and developing, installing, and maintaining utility software to support effective data communications operations.

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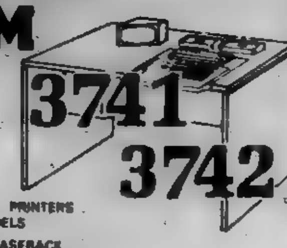

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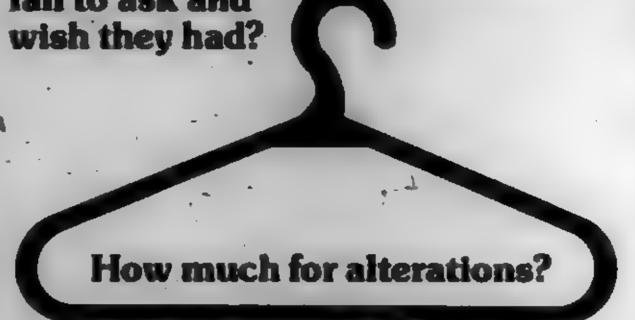
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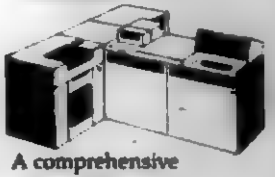

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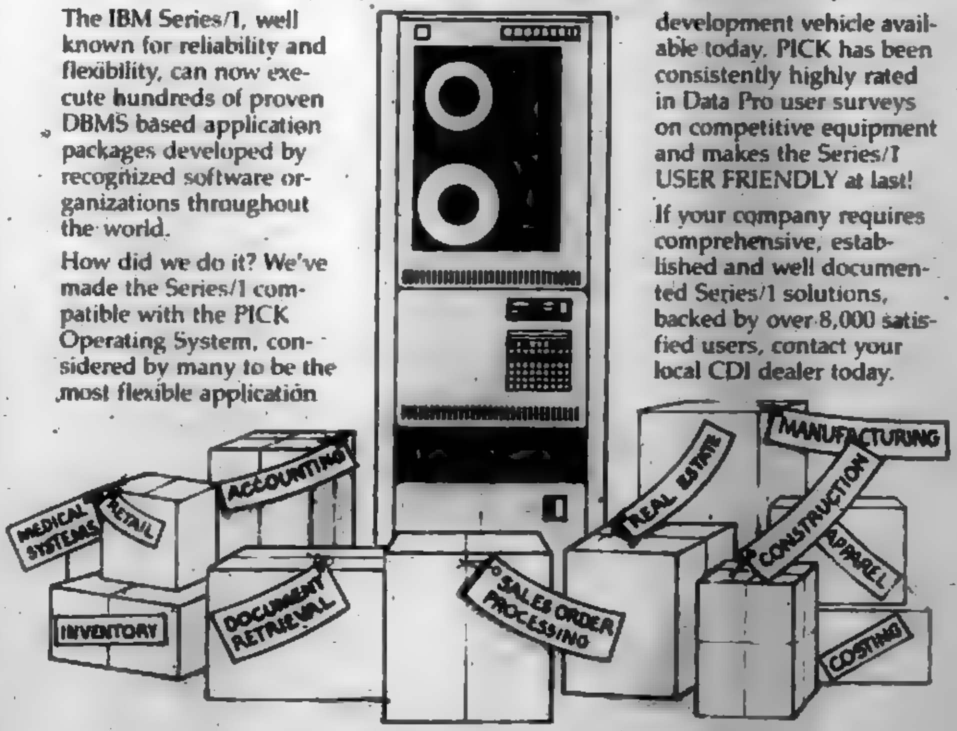

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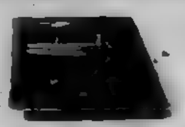

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ADVERTISERS INDEX

Access Matrix ... SR/32-SR/33
Access Technology ... 15
Amdahl Communications ... SR/27
Amer-Cal, Inc. ... 40
Applied Data Research ... 3
A.S.T. Research ... SR/6-SR/7
Anacom ... SR/16
Axlon/Datalink ... SR/17

The Back Store ... 39
BDS Computer Corp. ... 12
John Beall Company ... 67
Bear Computer ... 27
B.I. Moyle Associates ... 35
Black Box Catalogue ... SR/44

CGA ... 38
Chubb Institute ... 80
CIE Systems ... 56
Cincom ... 77
Circle Software Corp. ... 50
Codex Corporation ... SR/28-SR/29
Comdata ... 67
ComDesign ... SR/37
Computer Corp. of America ... 73
Computer Information Systems ... 8
Computer Management Research ... 76
Computerworld Buyers Guide ... 66
Computerworld on Communications ... 51
Computerworld France ... 74
Computerworld Subscriptions ... 42
Computerworld Supplement ... 60
Compuware ... 96
Concord Data Systems ... SR/4
Contel Info Systems ... SR/14
Cord Cable Co. ... SR/42
Corodale ... 39
CRWTH ... 58
CWCI Corporate ... 26
CXL Inc. ... 60
Cytrol ... 39

Data Control Systems ... SR/10
Datamation ... 72
Datamouth Computer Corp. ... 58
Deltak, Inc. ... 75
Digilog ... 96
Digital Consulting Associates ... 20
Digital Equipment Corp/
—Educational Services ... 18-19
Digital Equipment Corp/
—Networking ... SR/12-SR/13
Dorlen Products ... 61
Duquesne Systems, Inc. ... 31

Elgar Corporation ... 34,61
Ergonomic Software Inc. ... 40

Fibronics ... SR/39
Four Phase Systems ... 30
Fusion Products ... 45

Gandalf Data ... SR/10
Gejac, Inc. ... 63
General Datacomm ... 44
General Electric ... 53
General Research Corporation ... 33
GTE/Telenet ... 16

Hazeltine Corp. ... 25
Hewlett Packard ... 22-23
Honeywell ... SR/22-SR/23
Houston Instruments ... 62

IBM ... 49
ICCP ... 50
Imagen Corporation ... SR/47
IMM ... 10
Industrial Computer Controls ... SR/25
Innovation Data Processing ... 9
Innovative Electronics ... 54
Interface Systems ... 57
Intertel ... SR/41
Intra Computer ... SR/35
Invitational Computer Conference ... 54
ISO World ... 30
ITT Courier ... SR/5
ITT/DESD Division ... SR/24

Johnson Systems ... SR/20

Kaufman Manufacturing ... 5

Lear Siegler ... 52-53
Lee Data Corp. ... SR/26
Levi, Ray & Shoup, Inc. ... 37

3M/Com & Engineering ... 43
3M/Facsimiles Products Dept. ... SR/50
3M/Interactive ... SR/9
Madzar ... SR/36
Management Archetypes ... 39
McCormack & Dodge ... 106
Memorex Corporation ... 46
Microterm ... SR/21
Mohawk Data Science ... SR/35,SR/37,SR/39
MTI Systems ... SR/36
Multiplications ... 13

National Computer Corp. ... 7,34
NCR Corp. ... 42
NEC ... SR/15
Nestar System, Inc. ... SR/43
Newman Computer ... 36
Northern Telecomm ... SR/49

Ken Orr & Associates ... 36

Pacific Software ... 32
Phillips Info. Systems ... 76
Prentice ... SR/40
Proteon Associates, Inc. ... SR/46

Racal Vadic ... SR/11
Renex ... SR/34
Rixon ... 71
Rolm Corporation ... 27

SAS Institute ... 43
Saturn Systems ... 68
SDI ... 76
Softronics ... SR/38
Software AG ... 98
Software Corp. of America ... 71
Software Technology ... 40
Solutions, Inc. ... 17
Sperry Univac ... 76
Stratus Computer ... 37,SR/46
Syncd ... 40
Sytek ... SR/47

Tandem Computers ... 43
Technical Support Services ... 21
Technology Transfer Institute ... 68
Telecommunications Tech Corp. ... 6
Televideo Systems ... 64-65
Telhone ... SR/48
Term-tronics ... SR/30
Thomas Engineering ... SR/49
Tom Hopkins International ... 30
Tomlay, Inc. ... 70
Tone Software Corp. ... 39
Tri-Data ... SR/30

Ungermann-Bass ... SR/29
Union Bank ... SR/38
Universal Data Systems ... 70
U.S. Data Systems ... SR/8
U.S. Robotics, Inc. ... 40

Ventel ... SR/34

Wild Hare Computer ... 36
Wolfe Computer Testing ... 42

Xerox Corp. ... 96

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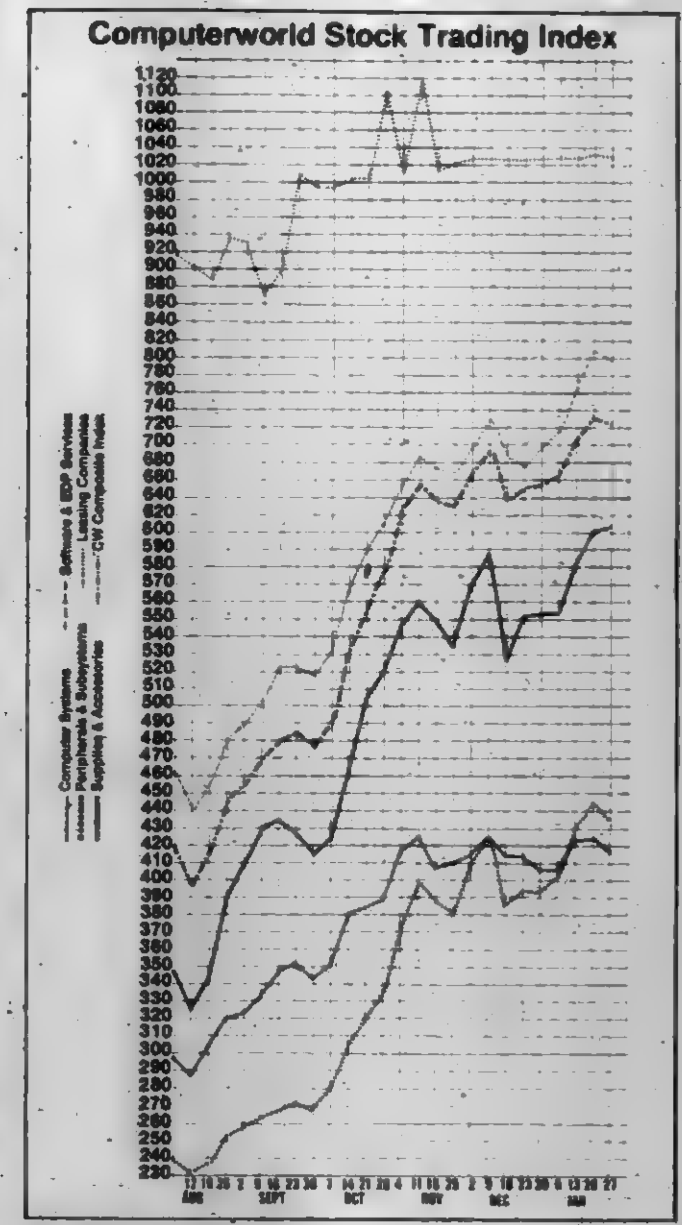
Computerworld Stock Trading Index



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EXCH		PRICE 1982-83 RANGE (1)	CLOSE JAN 26 1983	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP	17- 35	31 3/4	-1 3/4	-5.2
N	BURROUGHS CORP	28- 49	46 3/8	- 3/8	-0.8
O	COMPUTER AUTOMATION	7- 17	14	-1 1/4	-8.1
N	CONTROL DATA CORP	21- 43	41 7/8	+ 3/8	+0.9
O	CRAY RESEARCH INC	20- 45	40 1/2	- 1/4	-0.6
N	DATA GENERAL CORP	20- 59	45 1/2	-3 3/4	-7.6
N	DATAPOINT CORP	11- 54	21 1/4	- 3/4	-3.4
N	DIGITAL EQUIPMENT	62-118	115 7/8	+8 5/8	+8.0
A	EECO INC	8- 11	8 7/8	0	0.0
N	ELECTRONIC ASSOC.	5- 12	10 3/8	- 1/2	-4.5
N	FLOATING POINT SYST	16- 33	33 1/4	+3 1/4	+10.8
N	FOXBORO	22- 40	36 3/8	-2 5/8	-6.7
O	FULCRUM COMP GRP	1- 3	1/4	0	0.0
O	GENERAL AUTOMATION	3- 8	5 7/8	+ 3/4	+14.6
N	HARRIS CORP	20- 43	37 7/8	-1 1/8	-2.9
N	HEWLETT-PACKARD CO	38- 82	77 3/8	+ 1/8	+0.1
N	HONEYWELL INC	60-104	88 3/4	- 3/4	-0.8
N	IBM	48-100	95 1/8	-3 3/8	-3.4
O	IPL SYSTEMS INC	5- 8	7	+ 1/2	+7.6
O	MAGNUSON COMP SYSTS	2- 18	2 5/8	0	0.0
O	MANAGEMENT ASSIST	7- 18	11 7/8	- 3/8	-3.0
O	MINI-COMPUTER SYST	1- 4	5/8	+ 1/8	+25.0
N	MODULAR COMPUTER SYS	6- 13	11 3/8	- 1/2	-4.2
N	MOHAWK DATA SCI	10- 18	15 5/8	- 1/4	-1.5
N	NCR	38- 95	91	- 1/4	-0.2
N	PERKIN-ELMER	17- 33	30 1/4	-1 7/8	-5.8
N	PRIME COMPUTER INC	16- 41	38 3/4	-1 1/2	-3.8
N	SPERRY CORP	21- 37	35 1/2	+1 5/8	+4.7
O	TANDEM COMPUTERS INC	14- 34	28 1/8	+1 1/8	+4.1
N	TEXAS INSTRUMENTS	71-161	158 3/4	+7	+4.6
A	WANG LABS "B"	13- 35	32 5/8	-1 1/8	-3.3
A	WANG LABS "C"	11- 34	30	- 1/2	-1.4

LEASING COMPANIES

EXCH		PRICE 1982-83 RANGE (1)	CLOSE JAN 26 1983	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE FINANCIAL CP	22- 30	28 1/2	- 1/4	-0.8
N	COMDISCO INC	13- 46	43 1/4	- 1/2	-1.1
O	COMMERCE GROUP CORP	1- 1	1/4	0	0.0
O	COMPUTER INVSTRS GRP	1- 2	3/8	0	0.0
O	CONTINENTAL INFO SYS	5- 20	18 3/4	- 1/4	-1.4
N	DPF INC	5- 13	10 5/8	+1	+10.3
N	ITEL	1- 5	5/8	- 1/4	-28.5
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	18- 38	37 3/4	- 1/2	-1.3

SOFTWARE & EDP SERVICES

EXCH		PRICE 1982-83 RANGE (1)	CLOSE JAN 26 1983	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 5	3 1/4	- 1/4	-7.1
O	ADVANCED SYSTEMS INC	8- 22	21	-1	-4.5
O	AGS COMPUTERS INC	7- 18	18 1/2	+2 1/2	+15.6
N	ANACOMP INC	9- 18	17 3/4	- 3/4	-4.0
O	ANALYSTS INTL CORP	5- 8	7 3/4	- 1/4	-3.1
A	APPLIED DATA RES.	15- 44	40	-3 1/4	-7.5
O	ASK COMPUTER SYSTEMS	12- 27	24 3/4	+1 1/4	+5.3
O	ASTRADYNE COMP IND	1- 5	3 1/8	- 5/8	-16.6
N	AUTOMATIC DATA PROC	21- 38	35	-1	-2.7
O	CGA COMPUTER ASSOC	5- 11	11 1/4	+1 1/2	+15.3
O	COMPUTER ASSOC INT'L	12- 40	38 1/2	+1 1/2	+3.9
O	COMPUTER HORIZONS	1- 9	8 1/2	-1	-8.3
O	COMPUTER NETWORK	4- 9	8 3/4	- 5/8	-6.4
N	COMPUTER SCIENCES	11- 20	17 1/4	-1	-5.4
O	COMPUTER TASK GROUP	8- 18	13 3/4	-2	-12.6
O	COMPUTER USAGE	2- 10	9 3/4	+3 1/4	+50.0
O	COMPUTONE SYSTEMS	13- 30	28 1/2	- 1/2	-1.8
O	CONSERV CORP	11- 20	17	+ 1/2	+3.0
O	COMSHARE	6- 10	8 5/8	- 3/8	-4.1
N	CULLINANE DATABASE	12- 33	31	- 3/4	-2.3
O	CYCARE SYSTEMS INC	8- 19	14 3/4	- 1/4	-1.6
O	DATA DIMENSIONS INC	1- 3	1/4	0	0.0
O	DATATAB	0- 1	5/8	0	0.0
O	DYATRON CORP	2- 4	3	0	0.0
N	ELECTRONIC DATA SYST	19- 50	47 3/8	- 1/8	-0.2
O	INFORMATICS INC	10- 24	22 1/8	+1 1/2	+7.2
O	INSYTE CORP	1- 3	2 1/4	+ 1/8	+5.8
O	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	4- 8	8 3/4	0	0.0
A	LOGICON	12- 30	28 3/4	- 1/4	-0.8
O	MGMT SCI AMER INC	8- 28	23 1/4	-4 1/2	-16.2
O	MATHEMATICA INC	12- 20	17 1/2	-2	-10.2
O	MATHEMATICAL APP GRP	12- 19	18 1/2	- 1/2	-2.6
O	NATIONAL DATA CORP	13- 26	17 3/8	-1 3/8	-7.3
O	PANSOPHIC SYSTEMS	8- 21	20 1/8	- 3/4	-3.5
N	PLANNING RESEARCH	6- 13	11 7/8	- 7/8	-6.8
O	PROGRAMMING & SYS	1- 4	3 1/2	+ 1/2	+15.6
O	REYNOLDS & REYNOLDS	17- 38	34 1/4	-1	-2.8
O	SEI CORP	21- 45	40 1/2	-1 3/4	-4.1
O	SHARED MEDICAL SYST	13- 28	23 1/8	- 5/8	-2.4
O	SCIENTIFIC COMPUTERS	8- 13	10 3/4	- 1/2	-4.4
O	SOFTWARE AG	5- 17	10 1/4	- 1/4	-2.3
O	TYMSHARE INC	12- 30	21 1/2	- 7/8	-3.8
A	URS CORP	10- 18	18	+1	+5.9
N	WYLY CORP	7- 13	10 7/8	- 1/8	-1.1

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1982-83 RANGE (1)	CLOSE JAN 26 1983	WEEK NET CHNGE	WEEK PCT CHNGE
N	AM INTERNATIONAL	1- 15	2 1/2	0	0.0
N	ANDERSON JACOBSON	8- 28	21 1/8	-1 1/4	-5.5
O	AUTO-TROL TECHNOLOGY	8- 18	18 1/8	- 5/8	-3.0
O	BANCTEC INC	7- 23	17	-1 1/4	-6.8
A	BEEHIVE INT'L	4- 10	8 3/8	- 7/8	-9.5
A	BOLT,BERANEK & NEW	8- 35	34 5/8	+1 1/8	+3.3
O	CAMBEX CORP	2- 8	2	- 1/8	-5.8
N	CENTRONICS DATA CORP.	6- 17	13 7/8	0	0.0
A	CETEC CORP	4- 7	6 1/8	- 1/4	-3.9
O	COGNITRONICS	2- 12	10 7/8	- 1/4	-2.2
O	COMPUTER COMMUN.	1- 2	3/8	0	0.0
A	COMPUTER CONSOLES	19- 42	40 3/8	- 5/8	-1.5
O	COMPUTER DEVICES INC	4- 23	12 3/8	- 1/8	-1.0
O	COMPUTER TRANSCEIVER	4- 8	7	- 3/4	-9.6
N	COMPUTERVISION CORP	19- 38	38	+1	+2.7
N	CONRAC CORP	21- 35	32 1/2	- 1/8	-0.3
A	DATA ACCESS SYSTEMS	2- 5	3/4	0	0.0
A	DATAPRODUCTS CORP	16- 37	38	- 1/8	-0.3
A	DATARAM CORP	5- 11	10 3/4	- 1/2	-4.4
O	DATUM INC	2- 8	8 1/8	+1 7/8	+30.0
O	DAVID JAMISON CARLYL	2- 7	3 5/8	- 1/4	-6.6
O	DECISION DATA COMPUT	3- 14	11 5/8	+ 3/4	+6.8
O	DELTA DATA SYSTEMS	1- 3	2 1/8	- 1/8	-5.5
N	ELECTRONIC M & M	5- 8	8 1/4	- 5/8	-8.0
O	EVANS & SUTHERLAND	18- 48	44 3/4	- 1/2	-1.1
O	GANDALF TECHNOLOGIES	10- 22	14 5/8	- 3/8	-2.5
N	GEN'L DATA COMM IND	6- 18	17 7/8	+ 1/8	+0.7
O	GENERAL TERMINAL CP	0- 4	5/8	0	0.0
O	GREAT SOUTHWEST IND	2- 9	3 1/2	0	0.0
N	HAZELTINE CORP	22- 43	46	- 1/4	-0.5
O	ICOT CORP	3- 8	7 5/8	- 1/4	-3.8
O	INFORMATION INTL INC	10- 27	17 3/4	-1 3/4	-9.0
O	INTEL CORP	21- 48	41 1/8	-4 5/8	-10.0
O	IPL SYSTEMS INC	5- 8	7	+ 1/2	+7.6
A	LUNDY ELECTRONICS	7- 14	12 3/4	- 3/4	-5.5
A	MSI DATA CORP	14- 36	33 3/4	-2 3/8	-6.5
O	NETWORK SYSTEMS CORP	15- 42	39 3/8	-3 3/4	-8.5
O	OMEX	3- 8	3	0	0.0
N	PARADYNE CORP	20- 50	42 3/8	- 1/4	-0.5
A	PENRIL CORP	7- 12	8 3/4	- 1/4	-2.8
O	RAMTEK CORP	12- 21	20 1/2	+1 3/4	+9.3
N	RECOGNITION EQUIP	4- 12	10 3/8	- 3/4	-6.5
O	SCAN DATA	1- 5	1 1/4	0	0.0
N	STORAGE TECHNOLOGY.	18- 40	23 1/2	- 1/8	-0.5
O	SYKES DATATRONICS	6- 34	13 1/2	- 5/8	-4.4
A	T BAR INC	7- 12	11 1/8	- 1/4	-2.1
A	TEC INC	4- 13	8 3/4	- 1/2	-5.4
N	TEKTRONIX INC	36- 68	65 1/8	+ 1/2	+0.7
N	TELEX	3- 27	25 1/8	+ 1/2	+2.0
O	TERADATA SYSTEMS CP	3- 10	7 3/4	- 7/8	-10.1
A	TIMEPLEX INC	7- 23	21 7/8	+ 1/8	+0.5
O	VISUAL TECHNOLOGY	8- 19	17 3/8	-1	-5.3
O	WILTEK INC	1- 3	1 3/4	- 1/8	-6.6

SUPPLIES & ACCESSORIES

EXCH		PRICE 1982-83 RANGE (1)	CLOSE JAN 26 1983	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMERICAN BUS PRODS	11- 18	10 1/8	- 3/4	-6.8
O	BALTIMORE BUS FORMS	1- 2	1 1/4	0	0.0
N	BARRY WRIGHT	13- 22	19 7/8	- 1/2	-2.4
O	CYBERMATICS INC	1- 1	7/8	0	0.0
N	DUPLEX PRODUCTS INC	12- 20	18	0	0.0
O	ENNIS BUS. FORMS	16- 30	25 1/2	0	0.0
N	3M COMPANY	48- 80	74	-5 1/4	-6.6
N	MOORE CORP LTD	28- 44	42 1/4	- 1/8	-0.2
N	NASHUA CORP	8- 18	18 3/4	- 5/8	-3.4
O	STANDARD REGISTER	32- 72	61	-5	-7.5
A	TAB PRODUCTS CO	12- 30	29 3/8	+ 1/2	+1.7
N	WALLACE BUS FORMS	22- 50	48 3/8	+ 1/8	+0.2

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH; B=BOSTON
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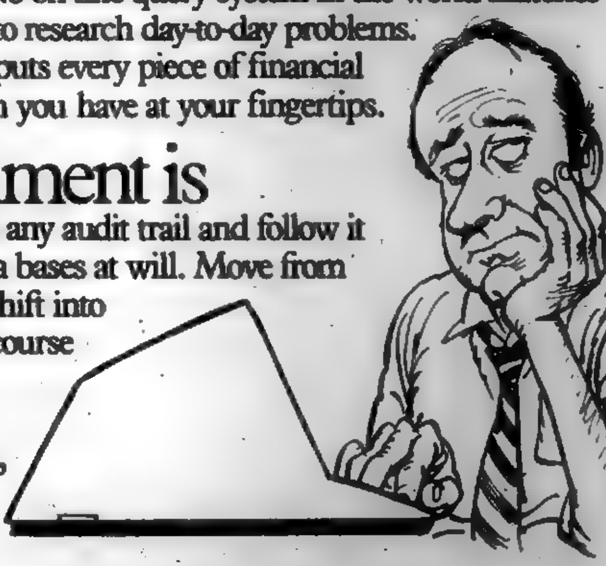

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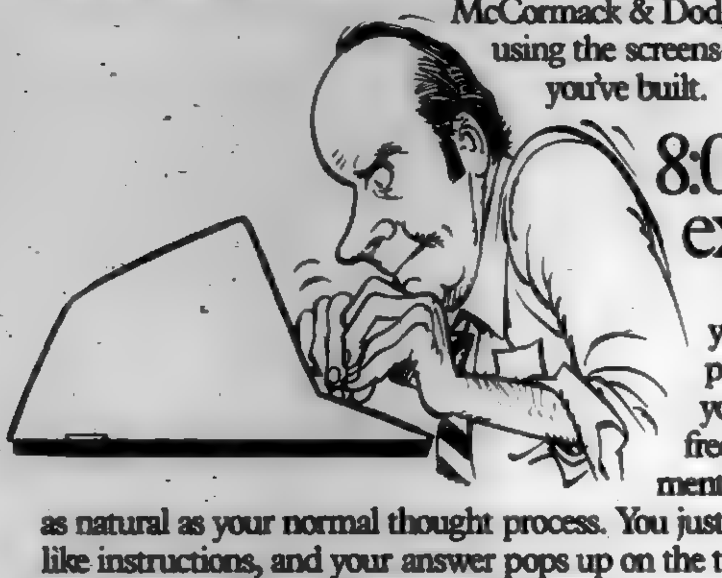

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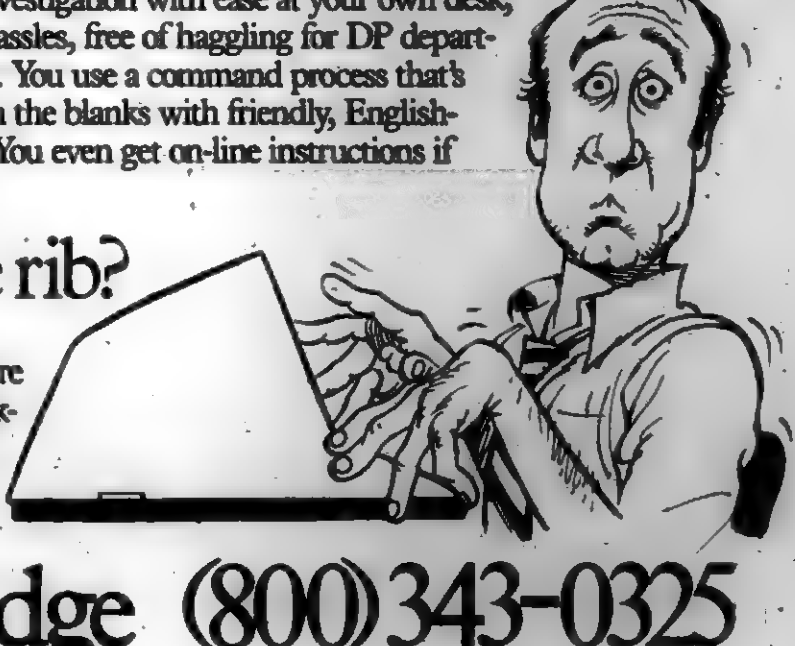

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CW Photo by B. Labens

Sen. John Glenn last week blasted the Reagan administration's high-technology R&D policies when he charged that it is 'intent on strangling the goose that laid the golden egg' (story on Page 6). Meanwhile, the federal budget delivered to Congress last week asked a 17% increase in R&D outlays (Page 7).

Two Machines Round Off DG's 16-Bit Line

By Ed Scannell
CW Staff

WESTBORO, Mass. — In what could be interpreted as an attempt to distract its 16-bit customers' attention from the low-end 32-bit upgrades offered by competitors, Data General Corp. last week announced two versions of a high-end 16-bit system, one of which is said to be up to 150% faster than DG's Eclipse S/250.

One system, called the 200C, will be marketed through the firm's Small Business Systems Unit and is targeted as an upgrade for users of DG's 200B system. The other, dubbed the Eclipse S/280, is aimed at both industrial and scientific applications and is intended to serve as an upgrade path for users of DG's S/120 and S/140 processors. This version will reportedly be sold through the

(Continued on Page 2)

TI Bases Micro On 8088 Chip

By Ed Scannell
CW Staff

NEW YORK — Texas Instruments, Inc. last week announced its first microcomputer for business applications that does not incorporate a TI-manufactured microprocessor. One TI product manager described the announcement as a "market-driven decision."

Code-named Pegasus and officially called the Professional Computer, the system uses Intel Corp.'s 8088 16-bit microprocessor. The system can also be enhanced with a voice management system and "natural language" option, both announced last week, but which will not be available until the third quarter of this year, according to a TI spokesman.

(Continued on Page 9)

NAS Unveils 4341 Rivals; Drops 6100s

By Jeffry Beeler
CW West Coast Bureau

MOUNTAIN VIEW, Calif. — National Advaneed Systems, Inc. last week restructured its medium-scale mainframe line by adding three processors that reportedly provide 20% greater price/performance than their nearest IBM equivalent, the 4341 Model Group 12.

NAS' just-announced Advanced System 6600 processor series replaces the company's AS/6100 medium-scale CPU family, which consisted of two models, the AS/6130 and the AS/6150.

Said to occupy less than half the floor space of the 4341-12, the AS/6600 family currently includes three IBM-compatible processors — the AS/6620, 6630 and 6650. The entry-level AS/6620 reportedly delivers roughly the same performance as the 4341-12 but costs 20% less. In contrast, the AS/6630 boasts 20% greater computing power than the IBM offering for about the same price.

The AS/6650, meanwhile, outperforms the 4341-12 by 60% but sells for approximately 33% more, according to an NAS spokesman.

NAS credits the AS/6600 line with providing a much broader performance range than the IBM-compatible mainframe family it succeeds. The AS/6620 reportedly offers about 10% more processing power than its AS/6100 counterpart, the AS/6130, and can be field-upgraded to the AS/6650, which supplies 30% to 40% greater DP horsepower than the AS/6100's high-end model, the AS/6150.

(Continued on Page 6)

Rather Than Total Communications Market

Fowler Says FCC to Deregulate Piecemeal

By Phil Hirsch
CW Washington Bureau

NEW ORLEANS — When the Federal Communications Commission does not find enough competition within a communications market to deregulate the entire market, it will deregulate individual services within that market, FCC Chairman Mark Fowler gave notice here last week.

High-speed data services were among those services mentioned as candidates for deregulation by Fowler when he delivered the keynote address at the Communication Networks Conference & Exposition.

Coverage of Comnet '83 continues on Pages 12 through 19.

Conference attendees found Fowler's statement especially significant because it expanded the scope of services deregulation generally thought to be contemplated under the commission's Second Computer Inquiry Decision.

The basic reason for deregulating the telecommunications marketplace is that "our society deserves the benefits [of advancing technology] . . . now," Fowler said, pointing out that "regulation, by its nature, embraces the status quo. It limits private incentive to innovate with new technology or, worse, discourages that innovation since new technology renders the embedded equipment obsolete."

In addition to high-speed data services, Fowler said, "the entire interexchange market is also a candidate" for deregulation.

Fowler indicated that another candidate is local exchange service, saying that "eventually and perhaps in

(Continued on Page 7)

Bank Coins Program to Identify, Retain Best DP Trainees

By Lois Paul
CW Staff

NEW YORK — It's an age-old problem, and Chemical Bank had to face it. How do you identify fast-track, high-potential DP trainees — and how do you retain them once they become full-fledged programmers?

Presented with that problem by its Systems Group in 1979, Chemical Bank's Technical Training Department began work four years ago on a screening and testing program to select the best candidates possible for a programmer trainee project. Turnover was high in the DP industry at that time; because figures of 25% to 30% were not unusual when the project was suggested, retention was a major focus of the program.

CW Photo by L. Paul

Chemical Bank knew that 'if we produced superstars who immediately left the bank, the [programmer training] program would be considered a failure,' observed George B. Taub.

"If we produced superstars who immediately left the bank, the program would be considered a failure," recalled George B. Taub, assistant treasurer of technical training.

The cornerstone of the screening effort was an aptitude test to screen applicants for the training program. Chemical Bank chose the Berger test from the Santa Monica, Calif., firm of Psychometrics, Inc. over the Wolfe test from Wolfe Computer Aptitude Testing, Ltd. of Montreal, primarily because Psychometrics supplied more information regarding the validity of its testing methods, Taub said.

According to Richard P. Halbrook, assistant secretary of Chemical Bank's research department, another factor in favor of the Berger test was that it allowed the bank to do its own analysis based on raw scores. The Wolfe test supplies a narrative analysis of the scores of each test taker.

Testing time was another consideration. The Wolfe test takes about 5½ hours, the Berger test approximately 2½ hours. Since Chemical Bank's recent test session involved 619 people, the difference was significant, Taub said.

During the third and most recent wave of testing and training, written invitations to apply for the program were mailed in November 1981 to 9,000 Chemical Bank employees. There was only one real criterion: They had to have been employed by the bank for a minimum of two years. Twelve hundred people responded to the invitations and, after a series of orientation sessions, 619 took the test; 81 passed.

The 81 who passed, along with six people who had taken the test previously and had asked to be reinterviewed, were scheduled for interviews. From those interviews emerged 41 qualified candidates for DP training, and training programs were

(Continued on Page 8)

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IBM Puts SQL/DS Under VM/SP

RYE BROOK, N.Y. — IBM has announced a release of its Structured Query Language/Data System (SQL/DS) relational data base management system for large-scale IBM and plug-compatible mainframes running IBM's VM/SP operating system. The software also now supports those programming in Fortran in both VM and DOS environments.

SQL/DS previously ran only under DOS/VSE and the SSE/VSE operating systems, which were designed for small to medium-size processors. Release 2 is intended to bring SQL/DS into the end-user-oriented information center environment, which primarily is being used within installations running large-scale mainframes, IBM noted.

SQL/DS consists of a relational data base manager with an English-like query language for batch, interactive and on-line environments.

Within SQL/DS, data is organized into tables and is processed in sets concurrently, rather than one record at a time, the vendor explained. This is intended to reduce the number of required user commands.

Release 2 of SQL/DS will be available in September for a license fee of $376/mo.

DG Announces Two 16-Bit Machines

(Continued from Page 1)

company's Technical Products Group.

The 200C processor is suited for applications involving order entry, inventory and warehouse control, the company said. It is software-compatible with the other three members of the CS family as well as with the 32-bit MV line. The system runs under the Rdos and AOS operating systems.

Packaged 200C System

A packaged 200C system contains an Eclipse CPU; 512K bytes of memory, which can be upgraded to 2M bytes; a 50M-byte Winchester-type disk; a 1,600 bit/in. magnetic tape backup; a 16-line asynchronous terminal interface; dual-bay cabinet; Dasher D200 terminal; Rdos operating system; and right-to-use license.

The 200C system reportedly can handle an additional 638M bytes of Winchester-type disk storage in increments of 50M, 73M and 147M bytes. In addition, the company claimed it has improved the reliability of the system's memory through a continuous error checking and correction feature that corrects single bit errors in memory.

The S/280, which is primarily aimed at the scientific marketplace and can be fitted with an optional floating-point processor, was designed to compete against the 32-bit machines offered by such firms as Digital Equipment Corp. and Perkin-Elmer Corp. According to S/280 product manager Aug Brown, the system's performance is said to equal that of DEC's VAX-11/750 32-bit superminicomputer.

Reasons Why

When asked why DG decided to pit another 16-bit system against competitors' 32-bit machines, Brown replied, "What we are doing is making a statement to our 16-bit customers that this is the next step in the development of our 16-bit line."

Brown said the applications best suited for S/280 include computer-aided design and manufacturing, process control and test equipment.

When used with an optional floating-point processor, the S/280 reportedly has a 900K-Whetstone rating, which the company claimed is faster than "most mid-level 32-bit minicomputers." In addition to the floating-point processor, the company attributes the S/280's improved speed to the microprogrammed, CPU's use of bit-slice technology, an on-board 4K-byte memory system cache, the use of third-generation bipolar components and the burst multiplexer channel that allows high-speed peripherals to transfer information in and out of main memory in bursts of 13.3M byte/sec and 9.7M byte/sec, respectively.

The S/280 is compatible with three of the company's operating systems: MP/AOS, which allows programs to be transported to smaller Eclipse systems; AOS, which increases the system's multiuser capabilities; and Rdos, which allows the system to be used in both real-time and batch environments.

A typical S/280 configuration containing 512K bytes of memory, upgradable to 2M bytes; the floating-point unit; a 25M-byte Winchester-type disk; integral quad floppy; operating system; and language entitlements costs $46,220. In its basic configuration, which includes just the CPU and 512K bytes of memory, the system is priced at $30,000.

A packaged 200C computer system and right-to-use language license lists for $57,130.

Both systems will be available 90 days after receipt of order, DG said from 4400 Computer Drive, Westboro, Mass. 01580.

This Week

IN DEPTH

A True Data Base Environment 53

NEWS

Eleven User Suits Slam Northrop Data Systems 4
Harris Poised to Unveil Modular 32-Bit Machine 5
Glenn Assails Reagan's High-Tech R&D Policies 6
Reagan Budget Asks 17% Increase for R&D 7
Data Entry Certification Tests Set for May, June ...10
DP-Based Intelligence Agency Goes Under 11
Network Concentrator Leads Product Parade 12
BOCs Seen Eyeing Ventures With Other Firms 13
Panel Looks at Bypass Technology 14
PRC Cuts Data Costs by Reselling Facilities 15
Firms Shoot for 'Info Utility,' Net Consolidation 16
Private Satellite Nets Seen as Positive Choice 17
Micro Termed Positive Influence on Computing ...18
Speed Held Major Factor in Mux Selection 19
Media to Pick MVP With DPS 6 22
Managers on the Move 23
Micro Buyers Seeking Computer Literacy: Study ..24
Micro Sales Seen Checked Until '90s 25
Innovators in Info Services Seen Succeeding 26

EDITORIAL

Editorial: Talk is Cheap 28
Lecht on Science: Corporate Shacking Up 29
Human Connection: College DP Job Guidance 29
Reader Commentary: Contracted Software 30

SOFTWARE & SERVICES

DP Managers Pleased With Info Centers 31
Managers Explain Role of Micros in Info Center ...35
Dasd Enhancements Announced 36
SAS/FSP Enhancement Provides Financial Help ...38
'OMS/Monitor' Provides On-Demand Info 42
Warehouse Management Tools Run on VAX 43
Computer Security Aid Out for VAX-11/780 44
Ramtek Expands Program 46

COMMUNICATIONS

Controllers Link Firm, 'Far-Flung' Workers 47
Ramtek Expands 6211 Terminal Unit 48
WUI Communications Expanded 49
Protocol Converter Targets System/34, 38 Users ..50

SYSTEMS & PERIPHERALS

Intel Develops Disk Memory System ....[illegible]
STC Axes 8370 Drive Production 64
Molecular Supermicro Line Extended 67
Prime Slashes Prices of 550-II-2MC Superminis ..69
Low-End Zeus Aimed at Multiuser Mart 70

OFFICE AUTOMATION

OA Experts File Mixed Reviews for Lisa 75

COMPUTER INDUSTRY

Difficulties Ironed Out on 5860: Amdahl Execs 77
Sperry Wins $476.2 Million Pact 77
Graphics Sales Seen at $17 Billion by '87 78
Protectionist Sentiment Likely on Capitol Hill 80
AIC Exec Envisions Intellect's Role 81
Marketing Seen More Decisive Than Technology ..86
Japanese Dominance in Graphics Seen Coming ...89
Mitsui to Distribute SL-1 90
ADVERTISING INDEX 118

IN-LAWS

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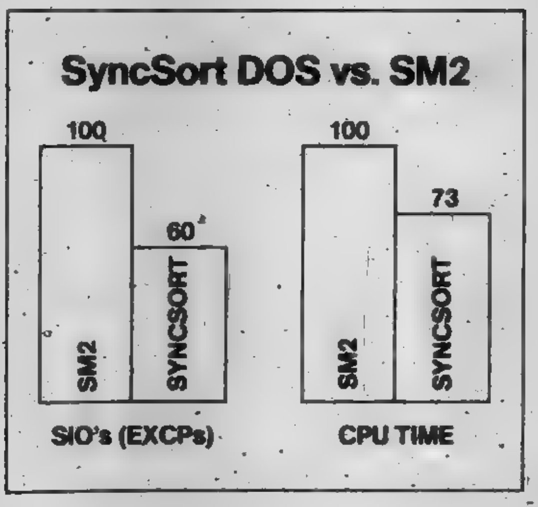

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Eleven User Suits Slam Northrop Data Systems

By Paul Gillin
CW Staff

The first 11 of what may eventually total 27 lawsuits seeking $405 million have been filed against the now-defunct Northrop Data Systems, Inc. (NDSI) and its parent company, Northrop Corp. The suits charge that NDSI misrepresented the capabilities of the packaged minicomputer systems it sold between 1976 and 1980 and then failed to provide adequate support when numerous and severe problems appeared.

The suits involve the Northrop Interactive Medical System (Nims), the New Group System — both for small medical offices — and the Standard Upholstery Furniture Manufacturing System for small manufacturers of furniture. Northrop could not be reached for comment about the suits.

Ronald C. Stock of Pastrana & Stock in Westminster, Calif., the law firm filing the suits, contended that NDSI knew of serious flaws in the Nims software when it began marketing the system in 1976 and that NDSI released the New Group System without field-testing it.

According to Stock, operating system software defects frequently misdirected and destroyed data. Software traps inexplicably shut down the systems and offered cryptic error messages that could not be deciphered by operators, he charged. Stock further claimed that self-purging features built into the New Group System regularly purged the wrong accounts.

The attorney also contended that NDSI programmed the systems in assembler code and then provided inadequate documentation when the company folded. "The customers were left essentially high and dry," Stock said.

The first suit — Colima Internal Medical Group, Inc. vs. Northrop Corp. and NDSI — is scheduled to go to trial in May. However, the courts must first decide whether the suit can be filed against Northrop or only against its NDSI subsidiary, which has been inactive since late 1980. Hearings were scheduled last Thursday in Los Angeles Superior Court on summary judgments made by both sides.

Northrop, based in Whittier, Calif., has entered a $1 million letter of credit from the Bank of America as a good-faith guarantee to pay for any judgment against it in the Colima case. Northrop is arguing that NDSI was an independent business and that the corporation's liability is limited in claims against its former subsidiary.

However, Stock said he will produce evidence that NDSI was a veil for the parent corporation and that Northrop is liable for the computer company's debts. "Any judgment against NDSI is essentially worthless. We believe they have no assets and no income. To get a judgment against NDSI would be futile."

Stock said his firm will base its argument partially on the sales pitch NDSI used to use to sell its systems. That strategy emphasized that customers could trust NDSI products because of the financial stability offered by Northrop, he said.

Settled by Arbitration

The suits come on the heels of a December judgment by the American Arbitration Association, which awarded $87,000 to Maryland Orthopaedic Clinic, Inc., now the Center for Pain Management and Orthopaedic Surgery, in a dispute with NDSI and Northrop. In denying a counterclaim by NDSI, the three-member tribunal ruled that Northrop was "the entity that owns and controls NDSI and [is] the real party in interest."

Stock said that although the tribunal's decision is in line with his arguments, the arbitration judgment does not set a precedent for a court suit. The standard contract provided by NDSI included provisions for binding arbitration in the event of a dispute. However, arbitration does not provide for punitive damages.

"We would like to get large punitive damage awards on the basis of what we consider to be outrageous conduct," Stock said.

The award in the Maryland Orthopaedic case represented the costs of purchase and maintenance for a New Group System bought by the clinic in August 1979. Attorney John T. Westermeier, a partner in the Washington, D.C., law firm of Abrams, Kovacs, Westermeier & Goldberg, said NDSI made numerous modifications to the system installed at the Maryland clinic, but failed to supply documentation for the changes when the computer company went out of business.

"The system was basically useless and eventually obsoleted," Westermeier said.

Northrop Users Detail System Woes

By Paul Gillin
CW Staff

One patient stopped in for an $18 treatment and received a bill for $35,000. A user generated a standard monthly report and found that $6 million had mysteriously been added to his firm's general ledger. And in a third case, $10,000 worth of receivables were found to be missing only days after the New Group System from Northrop Data Systems, Inc. (NDSI) was installed.

Such were the stories told to *Computerworld* by disgruntled users of medical practice systems sold by NDSI between 1976 and 1980. Two of the users are parties in a series of lawsuits that are being filed against Northrop Corp. and its former NDSI subsidiary. The suits are expected to seek over $400 million in damages.

Thomas Stearns of the Nashville (Tenn.) Orthopaedic Association, who is president of the Northrop Data Systems Users Group, has "perhaps 1,000" letters of complaint from NDSI users. "Those of us who bought systems early were able to get them up and working before things really began to fall apart," said Stearns, who is not participating in the lawsuits. "But those who bought just before NDSI went out of business [in 1980] have simply been tossed around from one service organization to another."

Dr. Richard Houghton, vice-president of the Allergy Pediatrics Medical Group, Inc. in Huntington Beach, Calif., said his company looked at several medical systems before buying an NDSI package for $80,000 in September 1977. "We felt it could handle our needs at the time plus our growth plans from four to six doctors. One thing that encouraged us was NDSI's promise that we'd have no software expenses, that they would make improvements as the customers required them," Houghton said.

Problems Obvious

However, problems were obvious the day the system went on-line, Houghton said. "After we transferred from the ledger cards to the system, the accounts receivable were off $10,000," he said. "Finally they found $5,000, but they never found the rest.

"We could never get the accounts to balance," Houghton claimed. "We continued to come out $100, $150 and $500 off in our accounts receivable. We would put fees in for the day and never be sure we were getting them in."

In the spring of 1979 the system shut down for 10 days, and Houghton had to borrow $10,000 to meet his payroll. "Finally they got the computer up again and suddenly the system that was supposed to last us a lifetime was full of data. I could not add a fifth doctor. I had to spend $21,000 to buy another disk drive," Houghton said.

A disenchanted Houghton began writing a newsletter for other NDSI users in 1978 and convened a West Coast users meeting in May of that year. "I just figured people locally would come," he said, "but I got calls from all over the country. We had 150 people show up." The organization joined with the national users group and Houghton was charged with finding an attorney. "I am the impetus behind this suit," he said.

Allergy Pediatrics continues to operate with two sets of books and is in the process of shutting down the computer to return to full manual accounting. "We are using an independent vendor for software support," he said. "The system is up, it's running, but it's too expensive to maintain."

Similar experiences were reported by the administrator of a Southeastern orthopedics practice, who asked not to be identified. "We almost bought an IBM [minicomputer system] because of the name, but went with Northrop because they expressed themselves as specialists in the field with the backing of Northrop Corp.," she said.

Problems From Day One

The firm bought the NDSI package in July 1978. "We had problems from day one. A $6 million item appeared in general ledger/accounts payable and we don't know where it came from," she said. "Some programs never worked. Our accounts receivable consistently were from $20 to $1,500 off."

The administrator said a programmer from Kalbro Corp., which assumed software support for NDSI systems in January 1981, analyzed the system and "found that 95% of our problems were system errors. He said it would cost $150,000 to get the system up again, and that was with a discount." The system originally cost $100,000.

The firm shut down the NDSI system in January 1982 and bought a Point 4 Data Corp. minicomputer with off-the-shelf software customized by an independent contractor. "It is a beautiful and smooth system," she said. "But we're still paying for the old computer. We took out a seven-year contract in 1978."

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Harris Poised to Unveil Modular 32-Bit Machine

By Susan Blakeney
CW Staff

FORT LAUDERDALE, Fla. — Harris Corp. is expected to expand its superminicomputer line this week when it unveils a machine that features modular expandability as well as the company's Integrated Memory Subsystem, announced last month. The system and some of its peripherals are packaged in a single cabinet, a Harris spokesman noted.

Designed for general business, scientific and engineering applications, the H700, slated to make its debut this week, reportedly handles multiple concurrent functions such as real-time processing, interactive and time-sharing applications, multistream batch and multiple remote job entry processing.

Like the H800 superminis announced at the same time as the Integrated Memory Subsystem [CW, Jan. 10], the H700 is intended to compete against Digital Equipment Corp.'s VAX-11 and other machines in the mid-range supermini marketplace. The H700 with optional cache memory, for example, boasts 75% to 80% of the performance of the VAX-11/780 at a savings of $60,000 to $75,000, the Harris spokesman claimed.

Basic components of this system include extended addressing features and the newly developed Integrated Memory Subsystem. Options include the cache memory performance enhancement and a floating-point processor.

The Integated Memory Subsystem allows the H700 to support up to 12M bytes of physical memory and offers up to 48M-bytes of hardware-implemented virtual memory, the Harris spokesman said. Available in 384K-byte, 768K-byte or 1.5M-byte increments, it is capable of handling program sizes up to 6M bytes and up to six ports of shared memory, the spokesman noted.

The cache reportedly enables the H700 to support up to 128 terminals.

Also available with the H700 are the company's Integrated Disk Controller and Communications Network Processor (CNP). The former reportedly combines the I/O channel and disk controller functions on one board and supports up to four disks. The latter is a single board that simultaneously supports up to 16 individually programmable communications lines for local or remote device connection via synchronous, asynchronous, isosynchronous and X.25 protocols. The operator's console port is also on the CNP.

The H700 system is built to fit in one cabinet that houses the CPU, disk drive and magnetic tape unit. It is supplied with a 22-slot CPU chassis with 18 slots for CPU, memory and I/O; the remaining four slots are dedicated to the floating-point processor option.

Prices for the H700 series begin at $49,900. Shipments are slated for the second quarter of this year. Further details can be obtained from Harris at 2101 W. Cypress Creek Road, P.O. Box 6200, Fort Lauderdale, Fla. 33310.

Corrections

In "U.S. Not Alone in Software Expertise: Futurist" [CW, Jan. 31], Charles P. Lecht cited reports of Nippon Electric Co. plans to shoot a fully automated chip-producing factory into Earth orbit by 1987. The company should have been identified as Nippon Telephone and Telegraph.

Control Data Corp.'s Cyber 815, a recently announced megamini that was developed by CDC Ltd. of Mississauga, Ont. ["CDC Ups Cyber Line, Cuts Memory Prices," CW, Jan. 24], has actually been available in the U.S. since November.

Burroughs Small Business Line Capped by 64K-Bit Machine

DETROIT — Burroughs Corp. last week unveiled a high-end addition to its B90 series of small business systems.

The B96, the first B90 to employ 64K-bit chip technology, reportedly offers three times the memory capacity and 30% more disk storage than earlier B90s. It is also said to occupy 40% less floor space than its predecessors.

The B96 is aimed at first-time users of stand-alone systems as well as larger organizations with distributed processing or networking applications.

Available with 512K to 1.5M bytes of main memory, the B96 can support up to 231.6M bytes of disk storage. The machine comes with Burroughs' CMS operating system and features Superstart, the newly announced menu management package.

The system can communicate through up to four data communications channels using either asynchronous or synchronous/bisynchronous transmission modes over leased or switched lines. With a Data Comm Power Pak, the B96 can support transmission rates up to 60K bit/sec, Burroughs said.

A typical B96 configuration costs $38,000. Burroughs is headquartered in Detroit, Mich. 48232.

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Glenn Assails Reagan's High-Tech R&D Policies

By Bill Laberis
CW Staff

WASHINGTON, D.C. — John Glenn — senator, astronaut and possible presidential candidate — took off the gloves last week and shot some bare-fisted jabs at the Reagan administration's research and development policies relating to high technology.

Claiming the administration is "intent on strangling the goose that laid the golden egg," Glenn charged that Reagan-engineered budget cuts have savaged government-sponsored research with a "sharp and unrelenting attack."

The Ohio Democrat made the remarks in his keynote address at a conference here last week on "High Technology Industries Public Policies for the 1980s." The conference was sponsored by Government Research Corp. and a group of industry organizations, including the Computer Business Equipment Manufacturers Association, Electronics Industries Association and Semiconductor Industry Association.

Vital to U.S. Posture

Like several other speakers at the conference, Glenn extolled government-funded research in electronics, saying such research is vital to the economic and military posture of the U.S. in the future. But, in what may be a harbinger of campaign rhetoric to come, Glenn made it clear he believes that the Reagan administration's budget initiatives, as well as its attitude toward basic research, carry national implications that are "deadly serious."

Yet Reagan, speaking before a group of electronics executives two weeks ago in Massachusetts, said his fiscal 1984 budget proposal contains "unprecedented increases" in government-sponsored research [CW, Jan. 31].

"While we mistakenly try to trim our budget deficits by taking a machete to our research commitments, our competitors are moving in the opposite direction," Glenn said, alluding to ongoing government-aided research efforts in Japan.

Japanese R&D Increasing

Glenn claimed that, in terms of gross national product, Japan as a nation will increase its research investment by a third over the next seven years, an effort fueled by a 50% increase in government supports for research.

Pointing to Japan's National Superspeed Computer Project and Fifth Generation Project, Glenn hinted that one area into which the U.S. government might channel research funds is supercomputer development. The senator said that the fruits of such research will have direct military and weapons systems applications.

"Whether we speak of America's military preparedness or her industrial strength, we simply cannot afford to become dependent on computers that are manufactured abroad," he said.

Attacking Education Cuts

Glenn also seized the opportunity to attack the administration's education cuts for student and faculty support, terming the president's response to a purported shortage of engineering graduates "frightening."

"First they cut virtually all funds for science education from the budget of the National Science Foundation [NSF]," Glenn said of administration cuts. "Then they tried to dismantle the NSF's Science Education Division. And then they appointed a Commission of Precollege Science and Math Education to tell us what to do about the problem they exacerbated. That's almost like the child who murdered his parents and then asked the court for mercy because he was an orphan," the senator said.

Not to be outdone by administration initiatives, Glenn proposed his own six-point program "to recapture America's technological superiority." His program includes restoration of government funding for research programs with high potential payoffs, rebuilding the NSF's education program and making the recently enacted R&D tax incentives a permanent fixture of the tax code.

NAS Brings Out 4341 Rivals

(Continued from Page 1)

The AS/6650 has no exact equivalent in the IBM mainframe world, an NAS official said. Users who outgrow the capabilities of the 4341 series have little choice but to migrate all the way from the 4341-12 to an entirely different IBM product line, the 3083. The AS/6650, therefore, fills a performance gap that the industry giant's medium-scale mainframes have yet to address, according to NAS.

Reduced Operation Costs

NAS also credits the AS/6600 family with costing less to operate than the AS/6100. The AS/6600's reductions in heat dissipation, power consumption, air-conditioning requirements and maintenance costs are attributable to increased densities in the mainframe line's semiconductor circuitry, which includes 1,500 gate/chip logic components and 64K-bit memory devices.

With the AS/6600 series' introduction, NAS' IBM-compatible processor spectrum now encompasses four main lines, the other three being the AS/5000, AS/7000 and AS/9000. As its name suggests, the AS/6600 falls somewhere between the AS/5000 and 7000 families in processing power.

All three members of the AS/6600 series require at least 4M bytes of main memory expandable in 4M-byte increments to a maximum of 16M bytes. In addition, both the AS/6620 and AS/6630 support five to eight channels, unlike the AS/6650, which accommodates five to 10 channels.

With the AS/6600's two smallest members, up to six channels can be of the block multiplexer variety, all capable of supporting the data streaming protocol. The AS/6650, by contrast, can be configured with up to eight such channels.

As many as five of the AS/6650's channels can transfer at 3M byte/sec, whereas up to four of the AS/6620's and 6630's channels can operate at the same rate.

Among their other features, the AS/6600 machines come with an optional high-speed arithmetic unit that reportedly speeds the execution of scientific and engineering instructions by 30% to 40%. Implemented in microcode, the unit is unavailable with IBM's 4341-12, NAS said.

Both the AS/6620 and 6630 boast a 60-nsec machine cycle and a 420-nsec read-write memory cycle, compared with 50 nsec and 350 nsec, respectively, for the 6650.

A 4M-byte, five-channel AS/6620 system costs $370,000, compared with $465,000 for a similarly configured 6630 and $580,000 for a basic 6650. All three mainframes will be available for shipment during the third quarter from NAS at 800 E. Middlefield Road, Mountain View, Calif. 94042.

NAS Stops Making CPUs

MOUNTAIN VIEW, Calif. — With the elimination of the AS/6130 and AS/6150 processors from its processor lineup, National Advanced Systems Corp. (NAS) ended all its domestic manufacturing of computer systems. Henceforth, the firm will buy all of its system hardware from Japan's Hitachi, Ltd., whose mainframes are already marketed by NAS in the U.S.

NAS decided it is more economical to buy Hitachi processors than to continue manufacturing machines within the U.S., an NAS spokesman said last week. The firm shut down most of its San Diego manufacturing facility last Monday, eliminating about 400 employees' jobs. About 70 to 80 employees will remain at the facility to provide hardware, software and engineering support to NAS users.

NAS will continue to make software and microcode modifications to Hitachi systems in order to make those processors compatible with IBM systems software, the spokesman explained. The firm will also continue to produce memory enhancements.

NAS began phasing out its domestic manufacturing in the late 1970s, when it started to buy processors from Hitachi. NAS' AS/7000 and AS/9000 processors are also manufactured by Hitachi, but older processors (the AS/3000 and AS/5000 lines) were manufactured domestically.

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Reagan Budget Asks 17% Increase for R&D

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Reflecting the White House's new enthusiasm for basic research and scientific education in this country, President Reagan's fiscal 1984 budget, delivered to Congress last week, calls for a 17% increase in federal research and development outlays.

Total federal support for R&D, including research facilities, was set at $47 billion, an increase of $6.9 billion over the 1983 level of $40.1 billion. This overall figure includes a 10% increase for the conduct of basic research, from $6 billion in 1983 to $6.6 billion in the next fiscal year, allowing a 4% real growth in this category. The $6.6 billion includes an 18% hike in National Science Foundation (NSF) programs.

Describing the administration's R&D philosophy as seeking "to complement private-sector efforts," the budget document stated that "the federal government's role is primarily to create an economic climate conducive to private investments through such measures as tax incentives and reductions in the burden of regulations.

"Federal government investments should be limited to longer term research and technology support, which the private sector does not have the economic incentive to provide for adequately to serve the national interest," the document said.

The administration said it will try to make better use of the increased research funds to attract high-caliber scientists and engineers, particularly young faculty members, into research; "encourage greater and more effective interaction among university, government and industry scientists; and upgrade the technical facilities of universities to enhance R&D productivity and train scientists and engineers."

Turning to budget details for NSF, which supports R&D in universities and research facilities, the fiscal 1984 federal budget would provide $1.2 billion for R&D, an increase of $180 million or 17% above the 1983 level, for an inflation-adjusted increase of 12%.

Within this category NSF support for basic research would grow by about 18%, specifically targeting programs that include R&D in computer engineering. It would also provide $180 million, an increase of 61% over 1983 outlays, for upgrading technical facilities at universities.

Looking at two NSF programs that support R&D in electronics and computer sciences, the agency's mathematics and physical sciences program would receive $364.3 million in fiscal 1984, compared with $299.7 million in 1983. And the engineering program would have its funding increased from $100.8 million to $123 million.

In order to promote better precollege mathematics and science education, the relevant NSF program would realize a 33.3% hike in funds, from $15 million in fiscal 1983 to $20 million in fiscal 1984. This program awards funds for instructional programs and training activities to colleges and universities.

Fowler Eyes Deregulation

(Continued from Page 1)

the not-too-distant future, competition . . . may come to the local loop. Cellular radio, cable systems, narrow beams, single sideband and satellites are only the beginning of competing local pathways. It is even within the realm of possibility that distributed central offices could disappear, with centralized switching done within the telephone instrument itself or through fast but dumb switching devices in satellites."

During his presentation, entitled "Regulation-Free Telecommunications: A Blueprint," Fowler made it clear that competition is the ultimate goal of present FCC policy. While the FCC still has a long way to go, "we have a compass and a map. Our compass is 'unregulation.' Our map is to free up incrementally selected markets and participants within those markets until the necessity for regulation's surrogate function is displaced by the primary regulator — the consumer."

While Fowler did not say how long the "unregulation" process would take or what steps the FCC would take to accomplish it, he did give some hints by saying:

- The FCC's Competitive Carrier docket, which is aimed at freeing nondominant carriers from regulation, should be completed this year.
- Although Message Toll Service is a candidate for deregulation, "we must wait to see the fruits of the modified final judgment [of the U.S. vs. AT&T antitrust settlement] and our access-charge proceeding. At that time, I expect federal regulators to step away."

The access charge proceeding involves the fees for local exchange service paid by interstate communications users. The FCC adopted a new charging scheme last month. While Fowler admitted that deregulation poses problems, he did not say much about them. However, he suggested that tools are available to "ameliorate potential ill effects during" the transition.

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Bank Coins Program to Identify Best Trainees

(Continued from Page 1)

scheduled for spring 1982 and winter 1982.

During the spring training session, Taub noted, only three people failed and one left voluntarily to pursue another career.

The graduates of the program are encountering great acceptance within the Systems Group. The Technical Training Department's job is to retain these people. One method is rewarding them with salary increases when they complete the training.

There also are subsequent six-month reviews and possible increases. Technical Training stresses that the cost center managers provide meaningful assignments for the training graduates.

Jeffrey W. Klein

Eleanor F. Miley

CW Photos by L. Paul

Richard P. Halbrook

Training Program Curriculum Features Cobol, JCL, TSO

NEW YORK — Chemical Bank's data processing staff worked with its Technical Training Department to set up the curriculum for the six-month programmer training program.

The curriculum is divided into three levels, based on the importance of various materials to the students' success in the production environment. Of primary importance are the sections on Cobol and IBM's JCL and TSO.

Items of secondary importance include various utilities and procedures. Tertiary items that are considered important primarily for background include assembly language.

The first 4½ months of the training program are spent in the classroom, with George B. Taub and Jeffrey W. Klein of the Technical Training Department teaching the courses and members of the DP staff helping on special topics such as IBM's IMS and CICS. Students receive programming assignments that they can complete either on microcomputers or on terminals connected to the bank's IBM 3081- and 3033-based DP installation.

After this segment of training is completed, each student is assigned to a cost center, a department that generally represents a particular application such as Customer Account System/Demand Deposit Accounts. Supervised by the training staff and the cost center manager, the student spends the next six weeks working on a project that must be put into production.

This is the "acid test of the program," Taub said, noting that the application projects include assignments such as sequential master file updates.

Interview Format Gauges Personal Characteristics

NEW YORK — The aptitude test given to prospective programmer trainees at Chemical Bank here evaluates technical programming skills, "but there were some other things we needed to know about people," recalled Eleanor F. Miley, assistant vice-president for technical training. So, together with a group of managers in the bank's Systems Development Department and the bank's Personnel Research Department, Miley developed the format for a structured interview.

The group came up with 35 characteristics or skills and classified these in seven dimensions, which appear on the evaluation sheet used by the interviewers. These are communication, self-motivation, flexibility regarding work hours, working under pressure, teamwork, perseverance and adaptability.

Because they needed a consistent way of measuring each individual candidate against these dimensions, they developed descriptions under each category called "anchors." These descriptions are based on a scale of one to five. For example, if the person being interviewed displays difficulty in communicating clearly, the interviewer gives him a "1" under communication.

The 45-minute interviews are conducted by three people who represent the technical training and systems development groups. They must reach a consensus on each applicant, so they score each applicant individually and then work together on a joint evaluation.

"Without this particular structure, it would have been chaos," Miley said.

Bank Stresses Test Validation

NEW YORK — When a company decides to use a test to screen people applying for programmer trainee positions, it must have the intent to validate the test for its audience, Eleanor F. Miley, Chemical Bank's assistant vice-president for technical training, said in a recent interview.

Validation is the responsibility of Richard P. Halbrook, assistant secretary of the bank's research department, whose group continuously gathers information, tracking the applicants through the program.

According to Halbrook's statistical analysis of the testing method, the bank's experience has been that about 5% of those tested will fail to complete the program. Given the relationship of the test and training scores, he said it is valid to assume that over 30% of the entire unselected sample would fail the training program if Chemical Bank did not use the test.

Every time a new class comes through, increasing the sample size, Halbrook becomes more confident of his statistics. "We know it is good and it is valid," he said. "It does not have differential prediction for racial groups."

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TI Racing Pegasus Against IBM, DEC Micros

(Continued from Page 1)

In addition to the Professional Computer, TI also unveiled a 150 char./sec dot-matrix graphics printer called the Model 850.

The Professional Computer is competitively targeted toward the IBM Personal Computer and Digital Equipment Corp. Rainbow and Professional 300 series microcomputer marketplace. It is not, however, completely software-compatible with the Personal Computer, said Eric Jones, president of TI's Data Systems Group, adding that it "has a reasonable degree of compatibility" with the IBM micro.

The Professional Computer's basic configuration is said to include 64K bytes of random-access memory, a 12-in. black-and-white monitor, a keyboard containing 12 function keys and a 320K-byte diskette drive.

However, a configuration more typical for business applications consists of the same amount of memory, the same keyboard, a 13-in. color display (which runs the same programs as the 12-in. monochrome display) and dual 320K-byte diskette drives.

The basic Professional Computer system costs $2,595. The expanded version with the color monitor and dual disk drives is priced at $3,840. The prices for both systems do not include the cost of software, the vendor said.

Both systems are reportedly designed to be used by department managers rather than clerical workers.

Two Innovative Options

TI said that what may catapult the Professional Computer above the rank and file of 8088-based machines are the voice management system and "natural language" interface options.

The voice management system combines the functions of speech processing, voice recognition and telephone management functions. One of the system's applications is voice mail, in which users can record a message that can be delivered immediately or at a preset time over a network to other Professional Computers or to a central data base, the spokesman said.

The system can also be used to record and edit dictation or add voice annotation to text and graphics information, according to the spokesman.

The "natural language" interface reportedly directs users in gaining information by helping them ask the computer questions using English words and phrases.

Prices for these options were not available at press time.

TI reportedly designed its Professional Computer system around Intel's 8088 chip in the hope of cashing in on the semiconductor's rapidly expanding and lucrative base of compatible software.

These compatible software packages are said to include:

- Microsoft Corp.'s MS-DOS, Digital Research, Inc.'s CP/M-86, Concurrent CP/M-86 and UCSD's P-System operating systems. (Through a Xedex Corp.-developed softcard called Baby Tex, the system is also reportedly compatible with programs written for the CP/M-80 environment.)
- Integrated applications software such as Lotus Development Corp.'s 1-2-3 and Visicorp's Vision packages.
- Relational Software, Inc.'s relational data base system.
- More than 100 graphics, word processing and financial modeling packages developed by software vendors such as Digital Research, Inc., Lifeboat Associates, Inc., Visicorp and Peachtree Software, Inc.

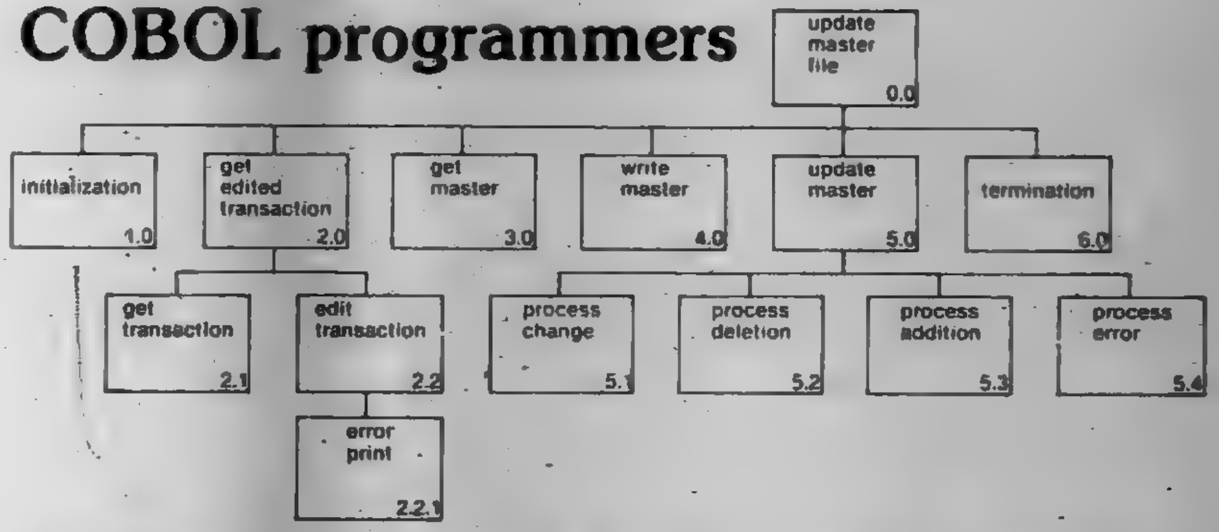
TI's Professional Computer currently has TTY and IBM 3780 communications capabilities; however, in the fall, 3270 bisynchronous communications, Systems Network Architecture and 3101 emulation and communications abilities will be added to provide compatibility with TI's line of minicomputers.

The Model 850 dot-matrix graphics printer outputs an original and two copies and accommodates paper widths from three to 11 inches wide. It is equipped with Epson America, Inc. and Centronics Data Computer Corp.-compatible interfaces allowing it to be connected to several popular microcomputers, a spokesman said. It costs $599.

Both the Professional Computer and Model 850 printer will be sold directly to large organizations through TI's national accounts program, the spokesman said.

Further information about the desktop system can be obtained from the vendor's Data Systems Group, 12501 Research Blvd., Austin, Texas 78769.

A test for COBOL programmers



What's wrong with this hierarchy chart?

Many things. The numbering system is inefficient (2.0, 2.1, 2.2.1, etc.). Modules 1.0 and 6.0 aren't functional (they are carryovers from unstructured thinking). The module names are inconsistent and imprecise (what's the difference between "error print" and "process error"?). But these are the least of the problems.

What's really wrong with this chart is you can't code a decent COBOL program from it. Why? Because the modules don't have the proper relationships to each other. In particular, modules 2.0, 3.0, and 4.0 should be subordinate to module 5.0. Then, module 0.0 can perform module 5.0 until all records are processed. And module 5.0 can get transactions, get masters, and write masters whenever needed.

Oh sure, there are ways you could make this chart work. You could code a two-paragraph section for module 0.0 and have the first paragraph perform the second one until all records are processed. Or, you could make modules 2.0, 3.0, and 4.0 subordinate to both modules 0.0 and 5.0. Either way, though, you end up with a sloppy programming product ... and you defeat the principles of structured design and structured programming.

Oddly enough, this chart was made up from examples taken from leading books and courses on structured design. In other words, everything that is wrong with this chart is presented as right by one educator or another. So it's little wonder to me that structured design and structured programming have a long way to go before they live up to their promise.

30-day trial and unlimited guarantee

First, take up to 30 days to review the books without paying anything. Second, if these books don't actually change your methods of program development, you can return them for a full refund, no matter how long you've had them.

A better method of design

If you'd like to learn a better way to develop hierarchy (or structure) charts, I'd like to recommend a couple of books to you. They were written by Paul Noll, a former trainer for a large company in San Francisco who is now an independent consultant to companies across the nation. He is one of the leading COBOL experts in the country, and he has some unique ideas about structured design. His books are written specifically for the experienced COBOL programmer.

In the first book, *Structured Programming for the COBOL Programmer*, Paul shows you how to create a structure chart that will be an efficient guide to your COBOL coding. You'll learn the four steps for creating structure charts ... what modules should go at what level ... how to create functional module names that tie in to the paragraph names of the COBOL program ... how to number the modules so the numbers can become part of the COBOL paragraph names ... the six things to watch for when reviewing a structure chart ... and much more. As a bonus, this book also covers structured coding, top-down testing, and structured walkthroughs ... so you can see how the effectiveness of these techniques depends upon the strength of the structure chart.

The second book, *The Structured Programming Cookbook*, is a tool kit for the development of structured COBOL programs. It gives standards and guidelines for program development so it becomes an instant standards manual for a structured COBOL shop. And it gives complete design, documentation, and code for four different types of business programs. As a result, this book can have a major effect on programmer productivity because it helps stop program re-invention.

If you're already using structured design and structured programming, I'm convinced that Paul's books will help you to improve your methods ... and your results. On the other hand, if you haven't yet been convinced of the value of structured techniques, you've got some exciting reading ahead of you. I think you'll be anxious to put Paul's practical ideas to work once you've finished the books and you'll find his structured techniques are easy to implement using the books alone.

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Data Entry Certification Tests Set for May, June

By Patricia Keefe
CW Staff

STAMFORD, Conn. — The first tests for data entry professionals who want to be certified by the Data Entry Management Association (Dema) will be given at the conclusion of two Mini-Conference and Professional Growth Seminars that Dema will hold May 16-18 in Dallas and June 5-8 in Scottsdale, Ariz.

The tests, which will take 90 minutes, will cover documentation, motivation, programming, training, forms and equipment design, interviewing, scheduling and control. The examination is optional and will follow the conclusion of the program, according to Marilyn Bodek, Dema executive director.

The exam will be graded with the aid of several professors of education who have been advising Dema over the years, Dema President Norman Bodek added.

The tests represent the culmination of two years of study by Dema committees into the professional certification process, according to Marilyn Bodek. The certification criteria and tests were developed by Dema officials working in tandem with chapter members after consultation with several testing services, she said.

Dema officials are hoping a Certificate in Data Entry (CDE) will bring holders "the respect and recognition that other certified professions have enjoyed for years," Marilyn Bodek added. Data entry professionals have been "ignored and looked down upon," said Norman Bodek, who likened the basic scope of a data entry worker's responsibilities to that of a concert pianist.

While Marilyn Bodek admitted there is no guarantee that CDE holders will find greater recognition and better pay as a result of their accreditation, she pointed to other certification programs — the Certificate in Data Processing and the Certificate in Computer Programming — and said it is likely that any employer would notice and appreciate the difference between certified and noncertified professionals.

Dema Vice-President Barbara Bradley sees the certification process as a way for data entry professionals to continue their education and remain abreast of technological changes in the field. "It would be a wonderful way for someone fairly new to broaden his knowledge and so elevate his performance," she said.

Some aspects of the Dema certification process are still unresolved. For example, there are no prerequisites for people who wish to take the exam, such as education or hours in the field. Nor has it been decided whether recertification is necessary and, if so, how often retesting should be conducted.

Anyone in the field who has taken the certification course, included as part of the conference program, should be able to pass the exam, Dema's president said. "This test is not designed to trick people," he added.

Sessions Precede Test

The sessions preceding the tests will be broken into two 1½-day parts. The first part will consist of several miniconferences and two concurrent sessions covering issues such as data entry in the electronic office, data entry in local networks and the expanding role of data entry in the organization.

The second day-and-a-half will concentrate on two seminars — the certification program and "Increasing Quality and Production."

The seminars and certification program will be conducted by Norman Bodek and other association officials. Registration fees are $250 for members and $290 for nonmembers taking the 1½-day-long miniconference; $285 for members and $325 for nonmembers taking the 1½ days of seminars; $470 for members and $510 for nonmembers taking the entire three-day program.

For those taking the optional exam, an additional $35 is charged, according to Dema, which can be reached through P.O. Box 3231, Stamford, Conn. 06905.

Proceedings Out On Conferences

BROOKLINE, Mass. — Information Gatekeepers, Inc. is making available proceedings from two of its recently held conferences.

Proceedings from "The First International Local-Area Networks Conference and Exhibition" is a 92-page compilation of 18 papers presented at the conference last September. The papers focus on key issues of the applications and design of local-area networks such as architectures, protocols, standards problems and applications. The proceedings cost $125 a copy, the firm said.

Proceedings from Information Gatekeeper's April conference, "The Second International Videotext in the 1980s Conference and Exhibition," include 37 papers presented at the conference. Subjects covered include system descriptions, strategic outlooks, technical advances and discussions of various videotext applications. The proceedings cost $120, the firm said from 167 Corey Road, Brookline, Mass. 02146.

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DP-Based Intelligence Agency Goes Under

By Jake Kirchner
CW Washington Bureau

ARLINGTON, Va. — The financial backers of International Reporting Information Systems (Iris), the expensive computer-based intelligence agency founded late last year for private corporations, sent the company into bankruptcy when they abruptly cut off additional development money late last month.

Iris executives last week filed the necessary papers to shut down the firm. However, at press time, Iris employees and creditors were waiting to hear if the firm might be restructured under bankruptcy protection and continue operation at some level.

Officials for the firm could not be reached for comment.

The end reportedly came as a surprise to Iris employees and customers. Several noted last week that following a one-third reduction in the Iris work force last month, the backers of the venture, primarily several large financial institutions in Europe, had voiced a strong commitment to see the firm fully operational.

Iris was founded in late 1981 with considerable fanfare here and abroad. The intelligence agency's plan was to attract large information-hungry corporations that would pay as much as $100,000 as a minimum for Iris services.

With start-up costs estimated as high as $20 million and with an international advisory council, including such luminaries as former British Prime Minister Edward Heath and former World Bank President Robert McNamara, the firm made an immediate splash in the international community.

Services Offered

Iris' services were to include customer-tailored reports on the political, social and economic activities of foreign countries and regions. Based on information from a network of Iris journalists and from thousands of published reports captured every day by Iris computers, the reports were to be put together by a large staff of experienced, multilingual analysts and then transmitted to customers' terminals.

The unique, sophisticated computer-based system at the heart of the Iris plan was developed by a team of former U.S. intelligence and Defense Department computer experts and was based on ideas currently in use in U.S. intelligence agency systems, according to Iris.

The system, based on Burroughs Corp. hardware, was considered so innovative that Burroughs Chairman Michael Blumenthal recently helped inaugurate Iris' computer center [CW, Nov. 22].

Adviser to Reagan

Head of Commerce's NTIA Resigns Post

WASHINGTON, D.C. — Bernard J. Wunder, chief Reagan administration adviser and spokesman on telecommunications and information policy matters, has resigned his position as assistant secretary of commerce.

Wunder will leave the post on March 1 to take part in several business ventures in the communications field in Texas. In his present Commerce Department post, Wunder heads the National Telecommunications and Information Administration (NTIA).

Wunder plans to work with former Texas Congressman Jim Collins in developing new companies, perhaps in the cable, cellular radio or broadcast areas.

"My experience is here in Washington," Wunder said last week. "What I need to do is go out and get experience in sort of the operational side of the marketplace."

There are no reliable indications at this point as to who will succeed him as NTIA head.

Wunder worked for Collins from 1973 to 1975 and later held several positions with House committees, including that of chief counsel and staff director of the Communications Subcommittee. He was appointed NTIA head in 1981.

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Union Carbide's new Material Acquisitions Data Processing System is relying on CYX to economically distribute transaction processing capabilities to chemical plants across the country.

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Network Concentrator Leads Product Parade

CW at Comnet '83

By Bruce Hoard
CW Staff

NEW ORLEANS — Infotron Systems Corp. topped the list of vendors with new products to show at last week's Communication Networks Conference & Exposition (Comnet '83) when it introduced its Model 792 network concentrator.

The 792 is said to reduce communications costs by concentrating data from many terminals over a single high-speed link or over multiple links to other 792 locations. It reportedly ensures error-free transmission, features switching and contention capabilities and provides redundancy options that eliminate the possibility of total system failure.

Input to the concentrator may be any combination of synchronous and asynchronous, dial-up and dedicated transmission at mixed speeds and protocols to 9,600 bit/sec, Infotron said. The unit accommodates a variety of binary synchronous protocols including IBM's Binary Synchronous Communications (BSC), Honeywell, Inc.'s GRTS II and Control Data Corp.'s UT-200.

The 792 was designed to handle new protocols as they evolve into common usage, an Infotron spokesman claimed.

Prices for the 792 start at $4,500, from Infotron at Cherry Hill Industrial Center, Cherry Hill, N.J. 08003.

Icot Corp. introduced three specialized airline CRT terminals designed to meet current airline requirements and allow expansion for future applications such as personal computing and local storage.

The Models 757, 767 and 768 perform a range of applications, including airline reservations, travel agency information retrieval and cargo systems support.

The terminals range in price from $1,995 to $3,500, depending on configuration and quantity. Icot is based at 830 Maude Ave., P.O. Box 7248, Mountain View, Calif. 94043.

New from On-Line Software International, Inc. was Telefile, a software system for bulk data transmission in IBM MVS Vtam environments. Nontechnical users can manage and process remote data sets in a distributed network with Telefile by identifying the remote CPU and specifying whether a particular file is being sent or received.

A permanent Telefile license costs $15,000, available during the second quarter of this year. On-Line Software International can be reached at Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

Associated Computer Consultants, Inc. (ACC) unveiled its Network Systems (NS) protocol package, an implementation of the Xerox Corp. Network Systems Protocols. The NS package is part of the vendor's Associated Computer Consultants Exchange System product line.

NS reportedly provides simple interprocessor communications between distributed resources for a variety of local-area network hardware implementations. It supports Digital Equipment Corp. PDP-11 and VAX-11 processors and the Unix, RSX and VMS operating systems.

Two versions are available. The NU-11/NS costs $4,500 for one to four units and $2,500 for additional units. The FE-11/NS costs $9,500 for one to four units and $7,500 for additional units.

ACC's home base is at 720 Santa Barbara St., Santa Barbara, Calif. 93101.

McGill Details AIS/1000 Plans

NEW ORLEANS — Users of Advanced Information Systems/Net 1000 (AIS/Net 1000) will be able to communicate with the network digitally, without modems, over existing dial-up local loops, American Bell, Inc. Vice-President Arch McGill indicated last week.

In a press conference convened at the Communication Networks Conference & Exposition, McGill also announced that the Dimension Prelude private branch exchange, which previously had a capacity of 30 to 100 lines, now supports a maximum of 400 lines.

He also said that any terminal that communicates via the Net 1000 network can function with the newly announced Dimension AIS/System 85 [CW, Jan. 24].

The American Bell executive declared that the number of Net 1000 access points will be expanded significantly by the end of this year, but he dodged a direct answer when asked if American Bell would continue AT&T's campaign to scuttle the separate subsidiary provision of the Federal Communications Commission's Second Computer Inquiry Decision. He made it clear, however, that he strongly opposes any restrictions on AT&T, such as the separate subsidiary provision, that are not also imposed on its competitors.

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Strategist Says BOCs Eyeing Ventures With Other Firms

By Phil Hirsch
CW Washington Bureau

NEW ORLEANS — Joint ventures with terminal equipment makers, information services vendors and others outside the telephone industry are a key part of the Bell operating companies' marketing plans, one of their chief strategists said here last week at a Communication Networks Conference & Exposition (Comnet '83) session.

Another speaker at the same session — Albert Halperin, chief of the Federal Communications Commission's (FCC) Planning and Policy Division — reported that the separation between competitive and monopoly services established in the FCC's Second Computer Inquiry decision will not bar deregulation of competitive services in markets that require continued regulation.

The news that Bell operating companies will form joint ventures with nontelephone companies came from Thomas E. Bolger, who is now executive vice-president of AT&T, but will become chief executive officer of one of the seven regional holding companies that will own the 22 to-be-divested Bell operating companies.

With partners, the Bell operating companies "can be and will be co-developers and co-providers of new offerings utilizing network switching, transport, transmission and call management capabilities," Bolger asserted.

ISDN Services

Bolger stressed the Bell operating companies' intention of introducing integrated switched digital network (ISDN) services as another means of being "in the forefront of the information age."

The beginning of the local ISDN will be the introduction "in the not-too-distant future of services such as local-area data transport — for low- to medium-speed data services — and circuit-switched digital capability, for high-speed data services," Bolger said.

Bolger and Halperin were two participants in a Comnet '83 panel on the future of local telephone service in the aftermath of the AT&T divestiture. The hot potato tossed back and forth by the panelists was what local service would cost and how those costs would be allocated.

Bolger said the financial viability of the Bell operating companies rests "squarely on our ability to drive local service prices to costs." To mitigate the threat of bypass, "the non-traffic-sensitive burden of the customer loop must be removed from toll and carrier-access charges."

Although this is one major aim of the new access charge plan adopted by the FCC last month, the idea is not endorsed universally.

One skeptic present at last week's panel was Edward F. Burke, chairman of the National Association of Regulatory Utilities Commissions, the chief lobbying group of state regulators.

Pointing out that the basic aim of the Communications Act of 1934 was to bring about universal telephone service at an affordable price, Burke contended that "insofar as you diminish universality and affordability, you diminish the value of communications service for all."

He believes "some sort of regulatory framework will continue to be needed, particularly to maintain universal service. I'm not as blindly optimistic as some on this panel," Burke maintained.

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A dish antenna watches over the Comnet exhibit hall.

Hot Topic at Conference

Panel Looks at Bypass Technology

By Phil Hirsch

CW Washington Bureau

NEW ORLEANS — "Bypass" was a hot topic here last week at the Communication Networks Conference & Exposition (Comnet '83) for an understandable reason.

Escalating private-line rates plus a growing demand for data speeds above 9,600 bit/sec have forced volume users to look for alternatives to telephone company-provided local loop facilities. But if the discussion at a Comnet '83 panel session last week was any indication, it will be a while before bypass becomes a viable local-loop alternative for most of those who need relief.

CW at Comnet '83

The bypass technology receiving the greatest amount of attention in the past few years has been embodied by digital termination services (DTS), which basically consist of a centrally located, omnidirectional microwave transceiver that communicates with remote user stations via shared 1.5M bit/sec, full-duplex channels. According to Jeffrey Krause, one of the Comnet panelists, the Federal Communications Commission's (FCC) recent access charge decision placed a major cloud over DTS.

Krause, vice-president of M/A-COM Development Corp., which owns Local Digital Distribution, Inc., the major U.S. supplier of DTS systems, explained that DTS appears to be more cost-effective than telephone company-provided local loop facilities. But since the commission's access charge decision will force a major revision of local telephone company rates, the amount of the difference will probably remain unclear until the end of the year, when the FCC is expected to accept new telephone company tariffs.

One question raised by this situation is whether the telephone companies can reprice their services low enough to kill off the competition before it has a chance to get established. Robert K. Bennett, marketing vice-president of United Telecommunications, Inc., insisted that this cannot happen because DTS and other bypass technologies use more modern technology than the telephone companies and have less overhead with which to contend.

Bennett acknowledged, however, that the limited bandwidth reserved for DTS is a significant disadvantage, at least for now, because it bars DTS carriers from transmitting voice. But DTS vendors are not wedded to DTS technology, he observed.

DTS Only One Option

Most of the companies planning to offer DTS are established, specialized carriers. For example, Bennett's company owns Isacomm, Inc., a resale carrier that leases satellite channels from Satellite Business Systems and resells them to insurance companies. DTS represents only one of the ways Isacomm and other DTS operators can reach their customers.

The other alternatives include CATV, point-to-point microwave and multipoint distribution service. The last is a specialized, microwave-based technology already operational in most of the nation's major urban areas; it is now an adjunct to cable TV networks and is used primarily to carry commercial TV programs.

In most cases, these alternative delivery systems have enough bandwidth to support voice, but because of technical and/or regulatory difficulties, it may be some time before they can be widely used, the panelists indicated.

For example, CATV — widely touted as a formidable competitor to telephone company local loops — cannot really compete until two-way systems are operating in several cities. CATV stations become individually addressable and interconnection is achieved among cable nets serving the same areas, according to Robert Schmidt, former president of the National Cable Television Association. Although work is under way in all of these areas, Schmidt indicated that it will be a minimum of two years and probably much longer before CATV's shortcomings are reduced sufficiently.

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PRC Buys Headquarters, Cuts Data Costs by Reselling Facilities to Other Tenants

By Jim Bartimo
CW Staff

NEW ORLEANS — Unlike many businesses that resell common carrier lines, Planning Research Corp. (PRC) never leaves its McLean, Va., headquarters building to find customers for its voice and data networks.

Speaking at the Communication Networks Conference & Exposition (Comnet '83) here last week, PRC's telecommunications manager told how the consulting firm lowered costs by reselling data processing and telephone services to the other tenants of the building, which houses PRC's corporate headquarters, engineering and other departments. Some 70,000 of the cross-shaped building's 481,000 square feet are occupied by other companies.

"In the process of occupying the building," John D. Daly recounted, "it was decided that all services would be shared by the tenants — including data processing and telecommunications."

All the businesses in the PRC-owned building share a private branch exchange telephone system that offers TWX, Telex, facsimile, Wats lines, long-distance services from MCI Communications Corp. and satellite services from Satellite Business Systems. As with all resale common carriers, PRC buys these services from the vendors and then offers them to its own customers, Daly said.

To Keep Costs Down

"We didn't go into this to make money," Daly said, "We just did it to keep costs down. The more people that use the switch, the cheaper it is. It's used to attract tenants."

PRC has reserved 2,100 telephone numbers from the phone company, Daly said. While PRC acts as a scaled-down telephone company, it offers something to its customers that phone companies reportedly do not — training for all functions contained in each handset and a message center.

"Our studies showed that we were not answering 60 phone calls per day," Daly said. But with this service, "if my phone rings and isn't answered in four rings, the call goes directly into the message center."

Message Waiting

A message center operator enters the message on a terminal and places the message in Daly's file. When Daly returns to his desk, a "message waiting" light tells him to call the message center.

In addition to offering extensive telephone service to its customers, PRC also offers data processing through a kind of local-area network. "When we moved into the building," Daly said, "we had 22 computer systems. We made the decision to connect them through six-pair, 24-gauge Teflon twisted pair wiring."

Some 266 terminals are linked to PRC's data processing equipment by an RJ-11 telephone connector and an RJ-45 data connector at each desk. Data rates from 300 to 1.5M bit/sec are achieved, according to Daly.

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"The practicality of the system is tremendous," Daly said, noting that one established system also prevents extensive rewiring for tenants' individual phone and data networks.

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Firms Shoot for 'Info Utility,' Net Consolidation

By Bruce Hoard
CW Staff

NEW ORLEANS — Pitney Bowes, Inc. wanted data and voice together in one "information utility." Union Carbide Corp. wanted to eliminate a proliferation of applications-oriented networks.

Attendees at the Communication Networks Conference & Exposition (Comnet '83) here last week heard how both companies are reaching for those goals.

CW Photo by J. Barbmo

The Exhibit Floor at Comnet '83

CW at
Comnet '83

The problem with communications planning at Pitney Bowes, recalled Patrick J. Ryan, manager of data communications design at Pitney Bowes, was that it was too applications-oriented, resulting in network redundancy. "We were superimposing one network on top of another," he recalled at the show, which was sponsored by CW Communications, Inc.'s Conference Management Group.

Pitney Bowes had a voice electronic tandem network bridging several locations that needed to be upgraded. In addition, the firm had nationwide data communications needs, including support for its advanced field office automation system. Moreover, the Engineering Department wanted a computer-aided design and manufacturing system.

The company is currently seeking a voice-data private branch exchange (PBX) to integrate those two technologies. It is "cross-pollinizing" information between the voice and data departments to enable them to work together, Ryan said.

In the short term, the company wants to manage better the facilities it currently has in order to maximize returns from them. That could include developing some off-shift uses for the emerging network.

Long-term plans cover the creation of an "information utility" that will be transparent to both users and applications. Ryan pointed out that intelligence should be resident in the network, not the devices it supports.

The Pitney Bowes work plan is slated to define a statewide, 24-location local-area network in Connecticut. That "cornerstone of the entire network" will include a distributed PBX to augment several AT&T Dimension models already in place, Ryan reported, adding that he expects the PBX to be selected by the end of February.

Union Carbide

Meanwhile, Union Carbide, which has over 400 sales offices, warehouses, plants and distribution points, decided in 1977 to consolidate all the applications networks that had sprung up internally. After a presentation by IBM, Union Carbide decided to go with IBM's Systems Network Architecture (SNA).

At that time, the company had 230 interactive teminals and 100 remote job entry (RJE) stations. Now there are 3,500 interactive terminals and 350 RJE stations, according to Ken Yorgensen, senior systems analyst with the firm.

The company wanted SNA to help it set up an inventory control system that would keep it appraised of current stocks and act as a basis for internal billing. The conversion process to IBM's Vtam file management system and Synchronous Data Link Control protocol required some hardware changes, and it was necessary to tell users why the transition was being made, Yorgensen said.

In order to realize the desired network optimization, Union Carbide needed network standards as opposed to the "seat-of-the-pants planning" it had employed in the past, Yorgensen stated. Toward that end, it has done more analyzing of network utilization data.

The network billing plan for internal customers is being patterned after a service bureau approach.

Turning to benefits, Yorgensen claimed the multinational company will have saved $250,000 to $500,000 in communications costs by the end of this year.

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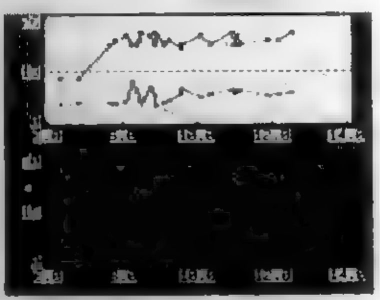

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Private Satellite Networks Seen as Positive Alternative

By Bruce Hoard
CW Staff

NEW ORLEANS — Private satellite networks are providing new communications alternatives for companies that were previously locked into fixed-trunk, node-by-node switching, according to Dr. Eugene R. Cacciamani, president and chief executive officer of Macomnet, Inc.

Cacciamani made his remarks at the Communication Networks Conference & Exposition held here last week by CW Communications, Inc.'s Conference Management Group.

Citing "dramatic changes" in satellite and communications technologies in the late '60s and early '70s, Cacciamani called the CATV industry an example of what can happen when satellites are married to communications technology. "The CATV industry exploded," he declared.

Satellite networks offer improvement over fixed-trunk, node-by-node switching by providing the ability to switch trunks for maximum efficiency, Cacciamani explained. He lumped satellite networks with public telephone companies, regulated special common carriers, satellite communications carriers and value-added networks as network alternatives for today's communications-intensive companies.

The proliferation of choices combined with deregulation in the communications industry has left users in a quandary, Cacciamani commented. Potential builders of private networks have to consider such stumbling blocks as staffing, maintenance and network management — tasks previously the responsibility of common carriers.

The Early Years

Early communications satellites were little more than "passive repeaters," he said, referring to Telstar, launched in 1962, and Syncom 3, launched a year later. Syncom 3 held between 100 and 200 telephone circuits; by the early '70s, satellites were handling 10,000 telephone circuits. Today, the number handled by C- and Ku-band satellites is about 15,000.

C-band satellites transmit in the 6 GHz range and receive at 4 GHz. Cacciamani said they are prone to interference from other transmissions, making it necessary to locate earth stations outside metropolitan areas.

Ku-band satellites send in the 12 GHz range and receive at 14 GHz. They are not affected by competing signals and earth stations may thus be placed in metropolitan areas. However, they are susceptible to adverse weather conditions such as rain.

Time division multiple access (TDMA) transmission is another popular satellite technology. The TDMA concept is used by backbone trunking networks, networks that commonly employ C-band transmission, Cacciamani said. TDMA acts on a time division multiplexing basis and requires that all stations be synchronized with each other to avoid transmission collisions.

Once satellite links have been established in a private network, the problem of local distribution remains. Cacciamani suggested several techniques to cope with it: point-to-point microwave transmission, microwave packet radio communications, CATV networks and fiber-optic cable. He said fiber-optic cable and twisted-pair cable are viable media for intrafacility communications.

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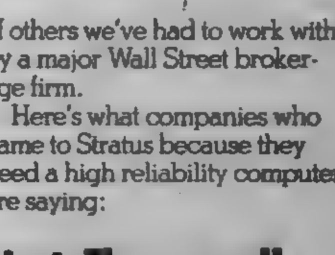

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Micro Termed Positive Influence on Computing

By Bruce Hoard
CW Staff

NEW ORLEANS — Personal computers have revolutionized the rules of computing while improving on mainframe and minicomputer technologies, R. Rembert Aranda told attendees at the Communication Networks Conference & Exposition (Comnet '83) here last week.

Aranda, who is manager of strategic planning for Digital Equipment Corp.'s Office Information Systems Group, repeatedly gave examples of how personal computers are superior to large shared mainframe and minicomputer-based systems. "The personal computer is not just smaller, it's different," Aranda claimed at a session of the conference sponsored by CW Communications, Inc.'s Conference Management Group.

CW at Comnet '83

Large systems are expensive and must be used almost continually in order to be cost-justified, while personal computers may experience downtime as high as 80% and still be cost-justified, he observed. Large systems are predicated on "user compromise," meaning they can not be user-tailored like microcomputers.

Moreover, Aranda said, the impact of change is more dramatic in a large system environment than in a personal computer environment.

Aranda pointed out that an almost unlimited number of applications software packages are available for micros, while mainframe and minicomputer systems have far fewer. Micro users are bounded only by their ability to load and unload floppy diskettes, he said.

Applications development may take over a year for large systems, he said. Even then, the applications may not be appropriate for end users because technical development staffs sometimes fail to understand the business requirements of the applications in question.

"The process is DP- and [management information systems-] driven," he declared. Personal computer users, on the other hand, may write their own software, tailoring it to their specific business needs.

However, there are pitfalls for micro users. Aranda noted that end users must assume the role of the systems manager — a role to which they are neither accustomed nor trained. There are also limits on the size of applications programs that can be executed and vendor software support is not good.Beyond that, software protection mechanisms may make it difficult to alter software, he observed.

In the immediate future, personal computers will be deployed as standalone units 75% of the time and as network workstations the other 25%, Aranda claimed, adding they will be important as data and document transfer devices when linked to networks.

Office Workers Want Micros, Speaker Notes

By Bruce Hoard
CW Staff

NEW ORLEANS — The growing popularity of personal computers has put them in demand by office workers, Lou Vogel, vice-president of the Communications Research Group in Baton Rouge, La., said here last week.

Discussing the use of personal computers as network workstations at a session of the Communication Networks Conference & Exposition (Comnet '83), Vogel maintained that "personal computers can be used to distribute the data processing instead of distributing access to the data."

According to Vogel, the disadvantage of using micros as workstation centers on their limited I/O capabilities, lack of software, the excessive amount of keyed-in data they require and the "fairly limited" amount of general storage they employ. In addition, micro use can lead to increased localized control and therefore decreased companywide control of computing resources, he noted.

The vice-president described what he called "file batching," whereby the personal computer is linked to a larger computer, sending files to and receiving files back from it. He said the asynchronous communications port common to most personal computers can be linked to the outside world via standard dial-up lines through the use of a modem and communications software.

The communications software should be hearty enough to withstand a noisy operating environment and capable of transferring binary and text files and commands between systems. It should also be efficient, provide multiple buffers and support full-duplex communications, he maintained.

There are still more drawbacks, Vogel warned. Information sharing is not interactive at the record level and the error checking provided by some software may be partially redundant in certain hardware environments.

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Speed Held Major Factor In Mux, Modem Selection

By Jim Bartimo
CW Staff

NEW ORLEANS — "Speed is addictive," James Michaels, multiplexer product manager for Timeplex, Inc., told attendees at last week's Communication Networks Conference & Exposition here. Michaels and John C. Parnell, modem product manager for Timeplex, spoke about the present and the future of modems and multiplexers.

The speed to which Michaels referred is that with which multiplexers transmit and receive digital information over telephone lines. Users of both modems and multiplexers always seem to want faster and faster transmission rates and will seldom stand for a cutback in speed, he said.

"The three laws of networking," Michaels said, "are networks never get smaller, networks never get slower and networks never stay the same."

It is for this reason that when Michaels looked at the future of networking, he saw a unified network management system that in addition to combining data and voice networks will increase efficiency, control and speed. "The traditional solution [to networking] has been separate data time division multiplexers and voice-time division multiplexers," Michaels said. However, with voice costs rising, only an integrated system will be economical in the future, he said.

In addition to increasing speed and lowering networking costs, an integrated network system also offers control of data links, modems, multiplexers and switches. "Most networking today is driven by computers, which leads to inefficient bandwidth utilization, misuse of the computer and single vendor limitations," Michaels said. "We want centralized network management, centralized fault diagnostics, universal compatibility with terminals and computers and efficient resource utilization."

Integration and higher speeds are two factors also dominant in the current and future states of modems, according to Parnell. For instance, the future outlook for switched network modems is higher speeds, reduced costs and integration.

A switched network modem offers such functions as automatic dialing and logon procedures. The modems operate at half- or full-duplex at asynchronous speeds of 2,400 to 4,800 bit/sec at full-duplex and require a telephone, Parnell said.

Switched network modems will soon be simplified and no longer strapped by dip switches in the hardware. "The day is coming when you can configure a modem from the terminal," Parnell predicted.

Also on the horizon for switched network modems is internal testing that will eliminate searches for breakdowns in the network and allow the user to know immediately where a breakdown has occurred.

For private-line modems, data compression will allow line speeds as fast as 25K bit/sec to be achieved. "Data compression is the most important thing for the next five years," Parnell noted. "It will allow modems to operate at speeds higher than they are rated for."

CW at Comnet '83

Private-line modems are currently offering speeds of 9,600, 14.4K and 16.2K bit/sec in the synchronous, full-duplex mode. These modems also offer multidrop capabilities along with diagnostics, dial back-up, multiport options and data encryption.

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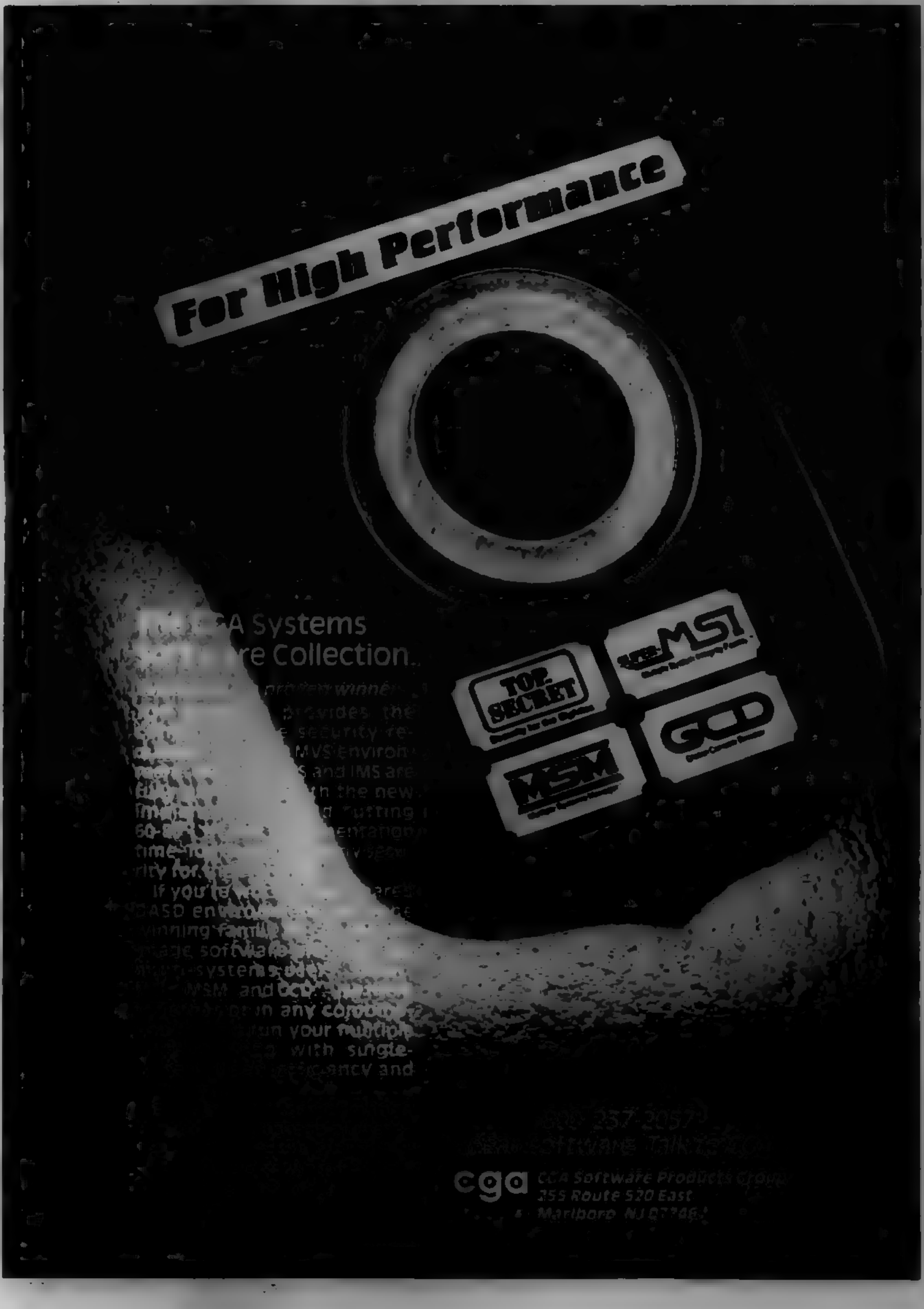

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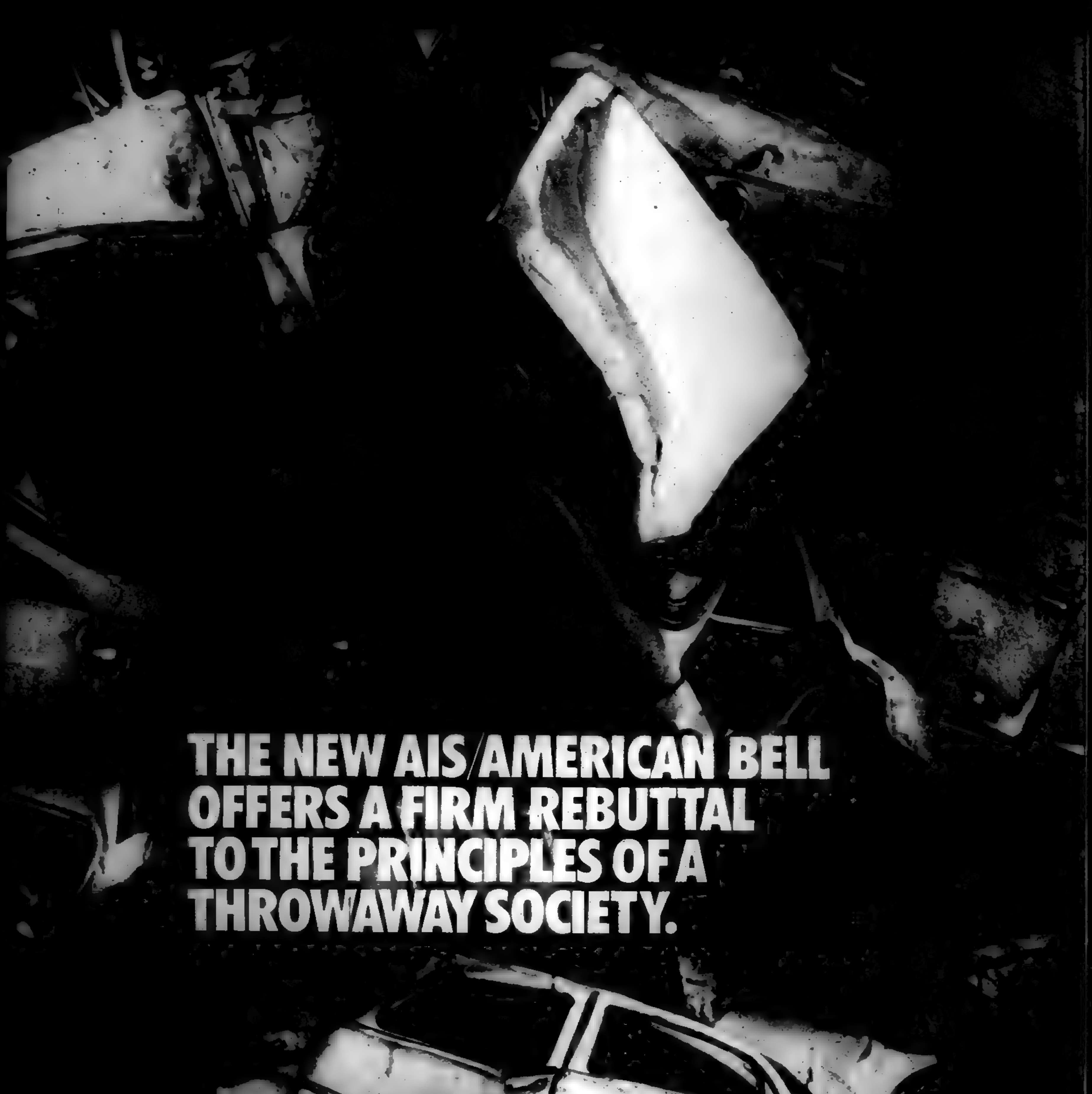

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At All-Star Game

Media to Pick MVP with DPS 6

LOS ANGELES — When the voting to name the Most Valuable Player (MVP) takes place at the National Basketball Association All-Star Game here Feb. 13, a computer will be on hand to tabulate the results.

Some 200 media persons will use punch cards to vote on the game's MVP.

The vote counter will be a 256K-byte Honeywell, Inc. DPS 6/32 minicomputer whose courtside configuration will include four CRT terminals, 26M bytes of disk storage, a 500 char./min reader and a 160 char./sec matrix printer.

The system is reportedly self-checking, capable of weeding out duplicate entries from the same person, and able to read cards inserted upside down.

Honeywell has been providing computers to compile MVP ballots for the past six years, delivering quick election results to sports fans. In last year's game, the Boston Celtics' Larry Bird won the prestigious award.

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Or write Datapoint Corporation, Marketing Communications T41CW, 9725 Datapoint Drive, San Antonio, Texas 78284.

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Interface To Meet In Miami

FRAMINGHAM, Mass. — The 11th annual Interface Conference will be held in Miami March 21-24. It is sponsored by the Interface Group.

The conference portion will feature 200 experts offering their knowledge in sessions on such topics as local-area networks, front ends, modems, multiplexers, policy and regulatory issues and office systems integration.

On the exposition side, 250 vendors are expected to be represented, a spokesman said.

The second annual industry awards banquet will be held March 22.

The registration fees range from $10 to $270, depending on the number of days one attends and conference/exposition selection.

More information is available from the Interface Group through P.O. Box 927, 160 Speen St., Framingham, Mass. 01701.

Probe Seminar On Messaging Slated for N.Y.

MORRISTOWN, N.J. — Probe Research, Inc. will sponsor a seminar entitled "Electronic Messaging: The New Wave in Telecommunications Information Management" in New York April 6-7.

The seminar will present the full range of messaging services and applications that are now available to managers, according to a spokesman.

Topics will include display pagers, cellular radio, information loop filtering and national and international services. Other topics include the following: voice mail, text mail and integrated message offerings, accordig to the spokesman for Probe Research.

The registration fee is $750 for individual attendees and $675 for additional attendees from the same organization.

Probe Research can be reached through P.O. Box 590, Morristown, N.J. 07960.

Managers on the Move

SHAWN B. KENDALL has become director of information resource management for Phelps Dodge Corp. in Phoenix.

Kendall will direct and coordinate data processing, communications, word processing and all of the related activities for mineral extraction systems in the Western Regional Data Center.

He joined Phelps Dodge in 1976 as a test engineer in the Division of Environmental Engineering & Research at Tucson, Ariz. In 1978 Kendall was transferred to the Morenci Branch and installed as systems engineer in charge of the Systems Engineering Department.

Kendall became management services supervisor for the Morenci Branch in July 1979 and in June 1981 was named assistant director for research and development in IRM-West.

He holds a B.S. degree in chemical engineering from the University of Arizona.

•••

JAMES A. McCOY has been appointed director and general manager of information services for the Management Systems Group of United Energy Resources, Inc. in Houston. McCoy will be responsible for directing and coordinating information systems research, planning, analysis, design and implementation.

McCoy joined United Gas Pipe Line Co., United Energy's interstate natural gas transmission subsidiary, in 1976 as a senior systems analyst. In 1980 he was appointed assistant to the executive vice-president and chief financial officer of United Energy, the postion he held until his most recent appointment.

McCoy received a B.A. degree in accounting from the University of Houston.

•••

CHRIS VEASEY JR. has been appointed to the position of branch chief, management information systems for Solar Energy Research Institute.

Veasey formerly served as Manager/Northern Operations for Denver's Regional Transportation District (RTD) and prior to that he was Supervisor of Financial Reporting for RTD.

Currently pursuing his doctoral degree at the University of Denver, Veasey received a master's degree in public administration from the University of Denver and an MBA from the University of Dayton.

He earned an undergraduate business degree from Syracuse University.

STEPHEN K. SMITH JR. has been appointed director of management information systems development and CHARLES SHORTER has been promoted to technical services department manager at Richfood, Inc., a retailer-owned wholesale food distributor in Richmond, Va.

Smith formerly served as programmer/analyst and was promoted to project leader in the Systems and Programming Department the following year. In 1979 he became the manager of that department.

Smith holds a B.S. in business administration from William and Mary College and both an M.S. and MBA from Virginia Commonwealth University.

Shorter will be responsible for systems programming, data base and data communications activities, including data communications hardware and software. He joined Richfood in 1981 as a data base coordinator for the Systems and Programming Department.

Prior to joining Richfood, he was technical services manager for the Crompton Co., a textile manufacturing firm. He attended Virgina Military Institute.

Shawn B. Kendall

Chris Veasey Jr.

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Charles Shorter

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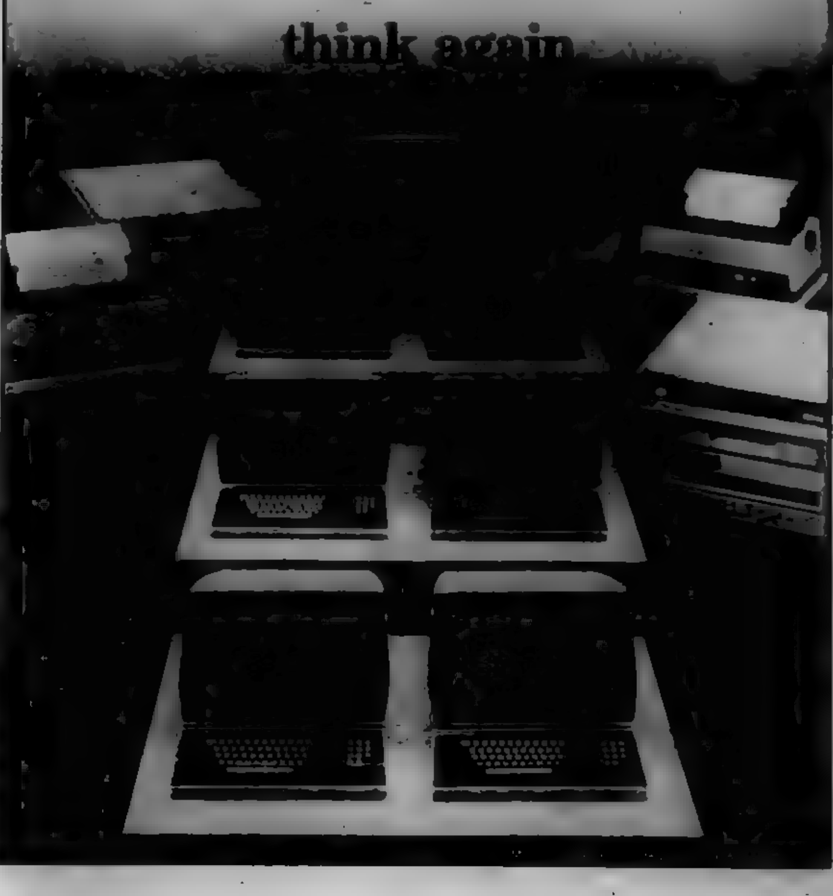

Micro Buyers Seeking Computer Literacy: Study

NORWALK, Conn. — The quest for computer literacy is and will continue to be the impetus for home computer sales, according to a recent report from International Resource Development, Inc. (IRD).

While current buyers are purchasing home micros to play video games and/or to provide their children with a new learning tool, 50 million to 80 million people will purchase home computers over the decade for the sole purpose of learning how to use them, the study estimated.

"Computers have a certain mystique about them as well as a frightening element having to do with threatening people's job security. The fact that a basic computer can now be purchased for less than $100 will encourage even the most hesitant individuals to experiment," the study said.

However, the study cautioned against assuming the inevitability of a "micro-in-every-home" revolution after the intial literacy stage. It questions whether applications can be found to make the use of the home computer an everyday occurrence. If not, users will let their micros gather dust.

What the industry needs, the study suggests, is a "[Visicorp's] Visicalc-of-the-home," a software package that consumers simply can't refuse.

The solution is expected to come from several sources, including users themselves, who are expected to provide insights to their needs through home programming attempts. Other contenders include the following:

- Integrated software that combines diverse activities such as word processing and number crunching.
- Expert systems that give "first-cut" advice on a variety of subjects, but is not expected to debut until the end of the decade.
- The development of natural language programming.

The report suggests that many suppliers are "pinning their profit hopes" on sales of add-ons to consumers, since the market for the computers themselves is becoming very price competitive.

This aftermarket is not expected to emerge for another five years, at which time computer-literate consumers will be looking to upgrade their systems for practical applications. The study predicted a rough time for small suppliers and major retail chains that are looking to capture some of the home computer market.

"Microcomputers in the Home"(No. 537) is available for $985 from IRD, 30 High St., Norwalk, Conn. 06851.

Spreadsheets For Micros Inventoried

DELRAN, N.J. — Over one million electronic spreadsheet packages will be running on personal computers by the end of 1983, making them the most popular business applications packages for the smaller machines, according to Datapro Research Corp.

In a 19-page report titled "All About Electronic Spreadsheets," Datapro has assembled information about 32 commercially available electronic spreadsheet programs from 27 vendors, including the most recent "second-generation" programs.

Considering the productivity improvements possible with spreadsheet packages, Alan T. Hirsch, associate managing editor for Datapro, said, "It's not surprising that the number of electronic spreadsheet programs in use is expected to double next year."

The Datapro report is intended to enable current and perspective purchasers of electronic spreadsheets to compare competitive programs and select those that best meet their particular requirements. The 32 different programs listed in the report range from basic programs to software such as Context Management Systems' MBA program, which integrates word processing, data base management, graphics and other functions into a spreadsheet program.

Other Vendors

Other vendors covered by the Datapro report include Visicorp, Software Products International, Information Unlimited Software, Sorcim Corp. and Osborne/McGraw-Hill Publications Co.

Each spreadsheet program listing provides data in 50 categories, including such system characteristics as maximum usable memory; screen characteristics; edit functions such as cell justifying and page scrolling; calculations performed, including percentage, logarithmic and trigonometric; file handling; print characteristics; user support features; and pricing and installation data.

The report also includes a list of questions for users to ask regarding system support and documentation before making a purchase decision. A glossary of technical terms is also included.

Copies of "All About Electronic Spreadsheets" are available for $19 each from Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

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In the two issues for 1983, *Computerworld On Communications* will apply the proven editorial resources of *Computerworld* to the area of communications networks. It will look at the implications of enhanced communications within the business organization together with the impact on established systems operations.

So, if you're among the majority of *Computerworld* subscribers who are personally involved in the selection and implementation of communications equipment and services for their organization, you'll find *Computerworld On Communications* a valuable addition to the *Computerworld* family of special publications.

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Remember to look for *Computerworld On Communications* on May 18th and again on September 28th (advertising deadlines April 8th and August 19th)

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Resistance to Technology Cited

Micro Sales Seen Checked Until '90s

By Patricia Keefe
CW Staff

WALTHAM, Mass. — Don't be fooled by the personal computer advertising blitz currently sweeping the country. Video game popularity to the contrary, it will be at least 10 more years before home computer sales take off, Assistant Prof. Lynn DeNoia of Bentley College believes.

The main barrier to home computer sales is people's resistance to new technology, often a result of frustrating experiences with computers in other facets of their lives, according to DeNoia, who is coordinator of Bentley's master's degree program in computer information systems. DeNoia is involved in several projects at the college involving personal computers, including plans to set up an experimental network using coaxial cable to connect a variety of different microcomputers using Digital Research, Inc.'s CP/M.

Home computers are likely to remain a "fad" over the next 10 years, DeNoia said, until a generation of computer-literate children impact the market, causing sales to jump. "I know where people have bought home computers for their kids and become intrigued themselves. But there is a level of intimidation here for someone who has never used a keyboard before and here's this 12-year-old making it dance," she said.

Advertising is having an effect, DeNoia conceded, but "a lot of people pay money, have this box and then they don't know what to do with it. They think it's a viable tool for investment, but the largest investment needed to utilize it isn't money, it's time. You need to play with it to learn its capabilities."

Technical Inferiority Complex

Parents aren't the only ones coping with a technical inferiority complex. Teachers, too, are becoming "victims" face to face with the "micro monster" and its effects.

"It's happening in the schools where kids know more than the teacher, who is afraid to touch the machine in front of a class of 40 students," Denoia said.

Another problem soon to face teachers is an even more pronounced disparity in learning readiness between those children who have been exposed to educational programming and those who have not. "You'll have kids who can't spell 'circle,' but they can punch a button and draw one," DeNoia said.

With early exposure to the computer, "there is the potential to learn sophisticated concepts which, while not yet verbalized, are used long before the child is introduced to formalized learning."

This could change educational concepts, she said. "Instead of having to 'do' education to kids, they could be taught from the discovery point of view." Other side effects include improved dexterity and eye-to-hand coordination, DeNoia noted.

It is ironic that many practicing teachers resist the computer, while displaced teachers often turn toward high-tech industries in their search for new careers, DeNoia pointed out.

Another situation in which an unwilling audience is coming face to face with home computers occurs when the home becomes the office. Although "people talk a lot about this [and] not much is happening, there is still resistance from large companies who fear a loss of control over the home worker," she said.

CW Photo by P. Keefe

When more children are exposed to educational programming, DeNoia warns, 'you'll have kids who can't spell "circle" but they can punch a button and draw one.'

Intercomputer Dialogue Seen Key To Future Communications

WALTHAM, Mass. — Intercomputer dialogue is the key to future communications, according to Bentley College Assistant Prof. Lynn DeNoia, who believes personal computers will play an increasing role in facilitating this type of activity. Barring the way, however, is "a host of compatibility and privacy problems."

One advantage of using a personal computer with floppy diskettes is that no one can break into files at will. On the other hand, "the minute I hook up into any network, such as public service networks, I have a very large concern about someone monitoring my particular usage and reference — even though it has to be done in order to charge me," DeNoia said.

Federal intelligence organizations can easily track people who use a computer. "I don't even want to think about what they could find out," DeNoia said.

The question for home computer owners then becomes whether the benefits of subscribing to a service are worth the risk of surveillance, according to DeNoia. However, for those who want to use services, there are defenses such as the two-key (public encoder, private decoder) system and the National Bureau of Standards' Data Encryption Standard.

If security is not a concern, network compatibility may well be. With so many different personal computers attempting to interface with so many different mainframes, noncompatibility could easily create problems. Although standard protocols already exist in this area, the problem is providing software that is flexible enough to allow micros to interface with mainframes, DeNoia said.

While most micros have Ascii character sets, many IBM medium-size and large computers are based on Ebcdic. Institutions that have IBM mainframes and expect to interface with home micros will have to purchase a character converter box for $3,000 to $8,000, DeNoia said.

"The software we have now is inefficient and slow. There should be a compatibility mode that will read either set," she commented.

Micro owners may need two sets of phones, since data and voice transmissions often require separate facilities. Even systems that use the same lines usually do not allow simultaneous transmission, DeNoia said.

With those phones, users probably will have to purchase direct-connect modems. Acoustic couplers will be phased out unless the telephones soon to be offered by different vendors offer standard-size receivers, she predicted.

DeNoia also expressed the concern that "if we are stuck with the programming languages we currently have, I don't foresee any breakthroughs in the kinds of things we can do."

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Innovators in Info Services Seen Succeeding

By Robert Batt
CW West Coast Bureau

MALIBU, Calif. — Organizations that expect to achieve a competitive advantage by developing a strategy based on information services technology will need to manage risk, reward and the probability of success more carefully than in the past.

That is the major conclusion of a recently released paper entitled "Gaining Competitive Advantage — A CEO's Perspective," researched and coauthored by Victor Janulaitis and Richard Mason. Management consultant Janulaitis, a former executive at IBM and Touche Ross & Co., and Mason, professor of business and public administration at the University of Arizona at Tucson, asserted that an information services strategy can lead to new market opportunities as well as the traditional cost-reduction systems.

The successful companies, they argued, will be innovators. Any organization that looks only at a "simple" application of office automation, for example, and does not see new ways to link it to its basic business units may be missing an opportunity.

Integrating information services technology involves risk, the authors admitted. "You do it in order to gain a competitive advantage consistent with the level of risk you can successfully manage. The challenge is to develop a strategic plan for achieving this objective."

Such a strategy, according to the paper, must achieve a proper balance between growth, control and technological innovation. The chief executive needs to know; "What is the potential bottom line impact of the application of information services technology?" For the answer to this, managers must look at the organization's application systems, exploring such factors as strategic planning, decision support systems, the organizational maturity of the computer, communications, user and management team and the existing direction, pace and momentum of implementation.

Any organizational change entails two equally punishing pitfalls — one assuming too much risk, the other assuming too little. "For example, with too little change, an organization does not stay current with technology. It will start to face risks such as obsolete and unsupported software, inability to change to meet new business demands and the inability to recruit high-caliber personnel and technical resources to support its existing systems," Janulaitis and Mason pointed out.

On the other hand, if an organization undertakes too much change it incurs excessive risks, Janulaitis and Mason cite as an example the merger between Pan American Airlines and National Airlines: "The merger required consolidation of two airline reservation systems. Pan Am was incapable of handling the increased volume and complexity. How much business Pan Am lost is unknown; but its over-ambition in this case likely contributed to many of its current problems."

To gain a competitive advantage, the paper continues, companies need to look at the technological dependence and maturity of the industry and their organizations and review the systems that are the focus of their future competitors. The rate at which the industry is absorbing technology, the paper adds, dictates the overall risk the organization faces from changes caused by information services technology.

The absorption rate is based on two factors: the depth to which the technology is an essential component of the industry and the extent and sophistication with which the industry has adopted the technology. "This data can identify the new services a financial service organization is going to provide, or the new products which an office automation company is going to implement, or the new directions which a manufacturing or distribution organization can take to improve productivity. From this a plan for the information services function can be created."

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*[illegible]

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Calendar

Week of Feb. 27

Feb. 28-March 2, Washington, D.C. — **Structured Analysis/Design Workshop.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

Feb. 28-March 2, New York — **C Programming Language Workshop.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

Feb. 28-March 2, New York — **Computer Contracts.** Contact: Ruth K. Dargis, Brandon Consulting Group, Inc., 1775 Broadway, New York, N.Y. 10019.

Feb. 28-March 4, Pittsburgh, Pa. — **Design Techniques Workshop.** Contact: Bill Schoonmaker, Brandon Systems Institute, 4720 Montgomery Lane, Bethesda, Md. 20814.

Feb. 28-March 4, New York — **Structured Design Workshop.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

Feb. 28-March 4, Scottsdale, Ariz. — **Fourth Annual Conference on DP Performance Management.** Contact: Loretta Dryden, Applied Computer Research, P.O. Box 9280, Phoenix, Ariz. 85068.

March 2-4, Washington, D.C. — **Teleprocessing Software: An Introduction to Concepts, Systems and Applications.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 2-4, Washington, D.C. — **Information Systems Planning: A Structured Approach.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 2-4, New York — **Structured Systems: Analysis, Design and Programming.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075

March 3-4, New York — **Computer Networks: Protocols and Standards.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 4-6, Harvard, Mass. — **Computers and Personal Values: Sharing from Experience.** Contact: Arthur Fink, B614, Prince St., Wilton, N.H. 03086.

Week of March 6

March 7-8, Chicago — **User-Friendly Information Delivery.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 7-8, Washington, D.C. — **Data Administration: Successful Techniques.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 7-8, Chicago — **Optimizing Source Data Entry: Design Techniques.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 7-9, New York — **Data Communications: An Introduction of Concepts and Systems.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 7-9, Chicago — **Data Communications: Effective Network Design.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 7-9, Washington, D.C. — **Systems Analysis and Design: Concepts and Effective Practice.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 7-9, San Francisco — **Structured Testing: Tools and Techniques.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 7-9, San Francisco — **Data Base Management Systems: A Comparative Analysis of General-Purpose Systems.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 7-10, New York — **Computer Auditing.** Contact: Information Systems Resources, Inc., 1444 Balsam St., St. Paul, Minn. 55122.

March 7-11, San Francisco — **How to Develop an Effective Long-Range Data Processing Plan.** Contact: Keston Associates, 11317 Old Club Road, Rockville, Md. 20852.

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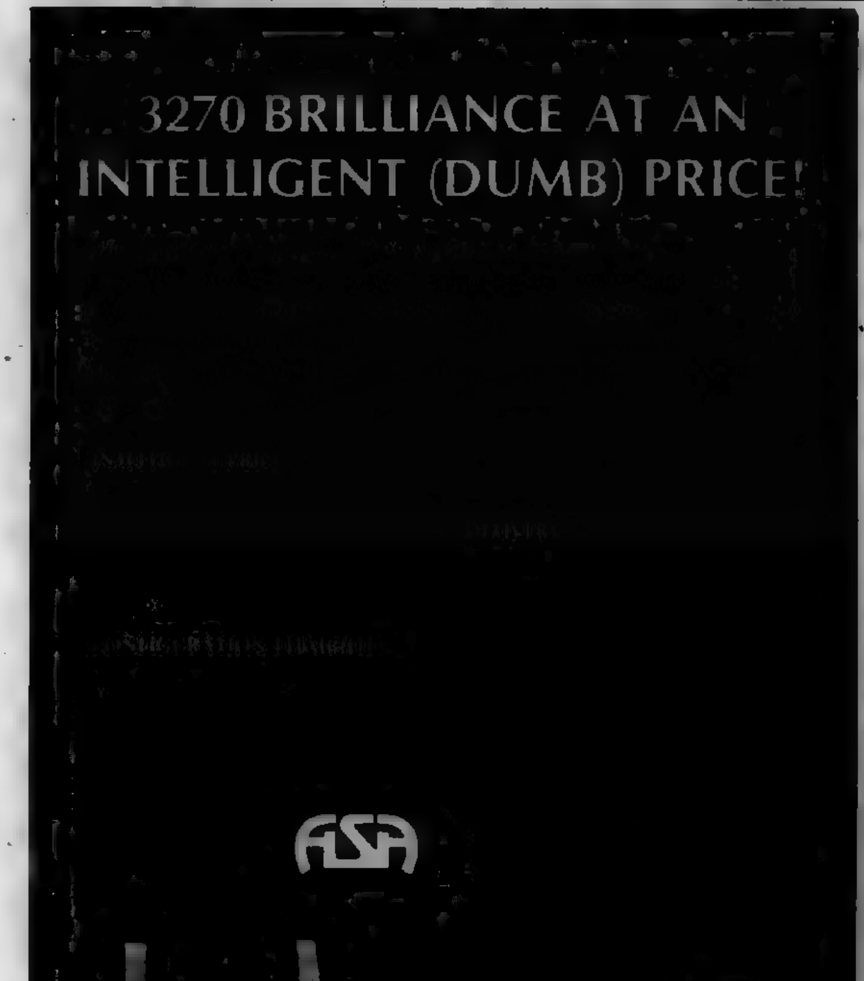

EDITORIAL

Talk Is Cheap

When the show was over, the mood among high-tech executives visited in Boston recently by President Ronald Reagan was distinctly upbeat. The president is committed to high tech, they said; we have his ear.

But when asked to comment on the president's proposed and actual budget cuts that have had a clearly negative impact on computer education and training programs, most of the executives balked. They also blanched a bit when asked to comment on the onerous federal deficits that are apparent features of Reaganomics.

The president had come to Massachusetts to show the rest of the country how an unfettered entrepreneurial spirit can propel a former smokestack region into prosperity and economic stability. He heaped praise on the high-tech moguls of the Massachusetts High Technology Council and told them the luster of their successes should be a beacon for the rest of this troubled nation to follow. He was like a high priest, blessing what he perceived as his flock of altar boys.

There's trouble in the parish, and the president did a marvelous job ignoring its underpinnings.

Construction of the Digital Equipment Corp. assembly plant Reagan visited was made possible by federal funds, both directly and indirectly. The inner-city industrial park where the plant is located has $7 million worth of federally funded roads. DEC's $3 million plant investment was financed via the tax-free industrial-revenue bond program, one that Reagan tried to axe.

The number of employees at the DEC plant is not likely to increase in the near future, for DEC has imposed a companywide hiring freeze because of the prolonged recession. The company has been hit with two consecutive quarters of earnings declines, with at least one more down quarter forecast for the immediate future. DEC is by no means alone.

The federally and privately funded computer training center he visited during his stay, also in the inner city, has seen its budget slashed so severely in the past year that the number of trainees there has been reduced by more than half.

Talk is cheap. The costs of technical education and training are not.

Yet the president seems uncommitted to upping the federal ante in shouldering the increasing costs of higher education, clamoring instead for tighter controls over the vast minority of students who default on their student loans. Our institutions of higher learning, he said, would do well to be run more like businesses. Such thinking constitutes a dangerous flight into free enterprise fantasy.

Yes, the computer industry is probably the healthiest patient in a ward-full of anemics. But the industry is not an island unto itself. The tremendous battering being weathered by America's primary industries and its banks and small businesses has clearly hit the computer vendors. One has only to cull IBM's earnings for 1982 from the overall profit picture to see that all is not roses with the computer companies.

The president tells us that "America is on the mend." But the troubled financial markets, armies of unemployed, idle plants and staggering federal deficits tell another story.

A strange recovery, indeed.

LETTERS

Meeting a Demand

The lack of demand for voice recognition products discussed in "Fewer Firms Developing Voice Systems: IRD" [CW, Jan. 17] is due to the failure of the firms developing these products to aim them at the right market.

Today's new and innovative technological developments often require the creation of a demand for a product rather than creating a product to meet a demand.

Yet there is a wide segment of the population throughout the world that would benefit enormously from a speaker-independent voice recognition product, namely, the millions of hearing-impaired individuals who could make telephone calls, follow television and movies more closely and communicate more effectively in everyday conversation with other individuals if there were such a product on the market.

Perhaps I am biased because I am deaf; but I have been aware of the potential of such devices for the past decade. I am always considering how much better I could carry out my job or aspire to a better one if I could carry on a normal phone conversation.

As a case in point, consider what a better job the National Captioning Institute could do in captioning the live telecasts of news programs with such a device. There is also the case of the deaf lawyer who argued a case before the U.S. Supreme Court last year using a CRT hooked up to a computer that translated the symbols being inscribed by the court reporter's machine to follow the judges and other attorneys' conversations.

Surely a market potential of millions would be enough of an incentive for these firms.

Bill Coombs
Systems Development
Idaho Power Co.
Boise, Idaho

Focus on Personal Needs

While reading the article "What Boosts Worker Morale?" [CW, Jan. 24], I found myself taking issue with its scope and tone. I manage DP professionals and find that the article does not address itself to the unique characters of people in the business. Many of the tips given are so generic that they could be applied to the word processing pool or a professional sports team as well as to DPers, with about the same results.

Perhaps, you could consider a more comprehensive article that addresses the process of managing in light of the personal needs of the individuals in the data processing field. My personal experience has been that managers achieve far greater productivity and higher employee morale by tuning into these needs:

- The need for personal expression in a work assignment.
- The need to be intellectually challenged.
- The need to exercise creative thinking.
- The need to be developed as a professional.
- The need to integrate personal goals with department/company goals.
- The need for an environment that encourages risk taking.

The list goes on. If software development and management information systems managers were to focus on these needs, they would find the environmental considerations mentioned in the article weighing less in the equation for improved productivity and employee morale.

It's about time we understood as much about our people as we do about our technology.

Richard J. Cowley Jr.
Senior Director
Support Services
National CSS
Wilton, Conn.

LECHT ON SCIENCE/Charles P. Lecht

Corporate Shacking Up: The 12% Solution

'Twelve percent ownership in a major corporation isn't something to be sneezed at. It's enough to put a person from IBM on Intel's board — a person with, say, enough purchasing power to command the attention of his most objective board colleague. Under such circumstances, it's hard to envisage Intel's continued full independence: But it is imperative for us to reserve judgment.'

That IBM's purchase of 12% of Intel Corp. serves to strengthen further both is beyond question. Thus, speculations to the effect that some other motive underlays this happy union — for example, the compelling desire to fulfill a corporation's patriotic duty to fend off alleged assaults by the Japanese upon our supremacy in electronics — are a bit much to take.

Base canards such as this rank in credibility with the suggestion that Americans have a duty to pay more for their data processing than required as a sign of loyalty to their country. (I wonder how we would react if the Japanese suddenly proclaimed their intention to make us a "free gift," as they say in consumer banking, of all the electronics we wanted.)

Anyway, three cheers for the management of IBM and Intel that consummated the "arrangement." This is surely creative corporate shacking up at its most exalted.

In IBM's case, kudos for its foresight in assuming a position of responsible partnership within an American corporate/scientific gem whose replication, were it possible to effect one, would have cost orders of magnitude more than what, in the event, they actually paid.

In Intel's case, let us acknowledge the particular genius of its timing: The capital-intensive nature of the semiconductor business makes companies like Intel especially vulnerable to takeovers unless there is a significant, built-in and collaborating marketplace for their output. What better marketplace than IBM, which is at once a client and owner of significance?

So it's a good deal for both — but its happening does raise some sticky issues. If we could set aside our conveniently self-exculpatory fixation on the Japanese, we could (and here intend to) address those issues without prejudice to any party concerned.

Serious students of the computer industry cannot help but notice that IBM, our industry flagship, has recovered its daring after 13 singularly unilluminating and suffering-saturated years in the ring with the Justice Department.

Bad Times for Others?

This could mean bad times for the other manufacturers, assuming IBM's faith in the viability — not to say respectability — of an aggressive, competitive approach to its natural marketplaces has been restored. Intel, for its part, has been a major supplier to numerous companies whose products are in direct competition with IBM's. Furthermore, many new home-computer companies employ Intel's chips in their products.

But, we are told, Intel will remain an independent company and its commitments to secrecy to all its clientele will remain inviolable. That the deal includes language barring IBM from acquiring more than 30% of Intel "gilds the lily" of the benign image of the deal sought by both companies, suggesting some sort of ultimate barrier to limit the scope of the former's influence.

But 12% ownership in a major corporation isn't something to be sneezed at. It's enough to put a person from IBM on Intel's board — a person with, say, enough purchasing power to command the attention of his most objective board colleague. Under such circumstances, it's hard to envisage Intel's continued full independence: But it is imperative for us to reserve judgment.

The IBM Board Member

Nonetheless, I am led to wonder about the role of the IBM board member whose position demands all manner of responsibilities to Intel, its shareholders, the government — and IBM. Without full disclosure of all important internal matters to him, we can only presume that devices will have to be put in place to limit his liability as a board member. Such devices could include blindfolds, earplugs and, ultimately, coma inducers (where the tempo and content of the meeting itself failed to procure this result at the critical moment).

I can see it now. His Sony Walkman on and blindfolded, an IBM executive enters the Intel boardroom. Led stumbling awkwardly to his chair, he sits, the inspirationally deafening strains of *The Stars and Stripes Forever* creating discretion-assuring tremblers in his featherweight earphones. He gropes for his coffee, sips a bit and waits until someone provides a signal; one tap on the shoulder means the blindfold may be removed, two taps, the earphones. And the Intel board meeting begins.

First, of course, comes the distribution of the agenda, annotated by pictorial symbology. Preceding each agenda item are letter-size pictures of earphones and a blindfold. If either symbol contains an oblique through it, the usage of the corresponding inhibitory device upon the IBM-sponsored board member isn't required. Another board member, specially trained for the function, further annotates his own agenda to anticipate his need to provide the requisite shoulder signals at the end of a period of blindfolded silence for the IBMer, who otherwise might miss his cue to remove either or both his "peripherals."

Intel's board meetings will take place in an atmosphere ever more tempered by the New Federalism, wherein we all prove our loyalty by exhibiting disdain for big (thus bad) government and give our all to dismantling it wherever we may find it. With moral responsibility to oversee industry off-loaded from our regulatory agencies to the discretion of individual board members, they'll have to take especial care to tune in and out of agenda items as they sit around the table indicating, for the record, who was paying attention, who wasn't and which device was used — blindfolds and/or earplugs or induced coma (the ultimate weap-

(Continued on Page 30)

HUMAN CONNECTION/Jack Stone‡

DP Job Guidance at Colleges in Need of Repair

This is the fourth article in a six-part series, "Computers and the Collegians," coauthored with Joanne Barker.

Like many other personnel development efforts around the data processing industry these days, projects dealing with the recruitment of college students seem to have fallen on hard times.

During interviews with college seniors, we learned that at least some campuses have apparently ignored or downgraded the serious guidance needed for pursuing a career in data processing. Yet if the shortage of up-and-coming DP manpower is all that great, one would reasonably expect that more could be done.

Pearl Marshall, a computer science major who attends a small private college, did not have the foggiest idea where to begin her job hunt but, fortunately, was too busy getting through her last year to worry about it. Her views were representative of the group.

"My immediate goal is to demonstrate aptitude and competence in the field by graduating with the highest possible grades. Even then, I understand that I won't be guaranteed a great job, but high marks will get my foot in the door!"

Proper Selection of Courses

"Counseling students for a job in the industry should begin, I would think, with the proper selection of courses," she said. Yet my adviser was either not well versed in this area or too preoccupied to apply himself to my particular case. I had to design my own curriculum, which included both required and elective courses, based only on my unsure interpretation of the course catalog and the logical, but not authoritative, suggestions of a friend. After I submitted it to my adviser for review, all he said was, 'Sounds good to me' and rubber-stamped it.

"I have no idea of the specific jobs in industry that are available, where to get information about them or how to apply for them. I've heard there was a student placement office somewhere on campus, but no one has told me what it does or where it is or if I am even qualified to visit it.

"There are no fliers on the bulletin boards announcing openings for computer jobs and none of my instructors has ever said anything about what the job market is like."

Slugged Out the Plan

"So I am not at all certain that my choices for departmental electives or the sequence of my required courses are best suited to my future career," she said. "When I reflect on it, I do feel somewhat deprived, but I am so loaded down with work that I don't have time to feel sorry for myself. So I've slugged out the plan on my own, just as I've had to struggle through poorly written computer science texts. Several industry professionals I know say all of this is good practice for the 'real world' of data processing.

"I'm anxious to get out and to see what this world is like, so much so that I'm carrying a 21-hour work load to get my degree in the shortest possible time. And as I progress further into the field, I'm beginning to think that the content of my particular course selections may not be all that critical to the job hunt. After all, how could six upper-class courses in my department prepare me for the endless diversity of positions that I expect are out there? For this reason, I figure that to assess a student's suitability for a job, prospective employers are forced to look at the academic record first, then the professionalism displayed in the job interview and, lastly, course work — at least I hope it's that way.

"However, I'm not depending on grades alone to build up my resume. I intend to pursue vigorously a summer job in the field this year, one that will provide my first practical experience with computers in the industrial setting."

READER COMMENTARY / Roland K. Bowns‡

Who Owns Software Written Under Contract?

As a company manager, you hire a talented programmer to write software for a particular application. Sometime after the software is installed, tested and functioning properly, you find out that the person who wrote your program is marketing it to others, including your competitors. Can you get an injunction to prohibit him from further marketing activities? Can you sue for his profits and/or your damages? It depends on who owns the software.

Who owns the software? If the programmer in question is an employee, the firm owns the software because under the copyright law "work made for hire" doctrine [17 USC Sections 101 and 201 (b)] the company is the author.

However, if the talented programmer is an independent contractor rather than an employee, the software belongs to him, not the company, unless a written agreement between them specifically states that the work was work made for hire or otherwise provides that the company owns the software developed under the contract.

Employee vs. Contractor

What distinguishes an employee from an independent contractor? There is no black or white answer. However, a recent case [BPI Systems, Inc. vs. Leith (1981) 532 F. Supp. 208] is instructive. In it the plaintiff, a company, sought an injunction to prohibit the defendant, whom the plaintiff hired to write 12 programs, from marketing certain software.

The defendant wrote and produced the software at his own place of business on his own computer. He was paid an agreed amount for each program, and no social security or income tax was withheld from the payments to him. The company could accept or reject each program as finally submitted by the defendant, but the plaintiff had no right to control the manner in which the defendant performed the work.

The plaintiff gave the defendant some confidential documents to help him. Those documents contained a keyboard routine, an I/O routine and a stop/go/quit routine. After he delivered the 12 programs to the plaintiff, the defendant marketed software that was almost identical to the programs he wrote for the plaintiff.

The court concluded that the defendant was not an employee of the plaintiff. The court said the work was specially ordered and commissioned by the plaintiff, but there was no written agreement that the work was work made for hire. The defendant was enjoined from using the plaintiff's routines.

However, and this is the important point of the case, the defendant was not enjoined from marketing the 12 programs that he wrote. He had to develop his own routines in place of the plaintiff's routines, but the portions of the 12 programs he wrote are his, not the firm's.

Resolving the Problem

There are two ways for the firm to resolve the problem:

- Make the talented programmer an employee of the company. Then any software he develops during the employee/employer relationship belongs to the company, even if there is no written agreement covering software ownership. (Programs developed at home on his own time that are not directly related to the company's business are exceptions.)
- Put a work made for hire provision in the written agreement. Then the software developed pursuant to that agreement belongs to the company and can be copyrighted by the company.

The first alternative may not be satisfactory. The company may prefer to deal with programmers as independent contractors rather than as employees for reasons of cost and security. Also it is difficult to determine whether software produced at home or off-hours is produced within the scope of employment.

The second alternative is more promising. This alternative should be satisfactory in all cases in which the programmer will consent to it.

Including the provision in a written contract establishes ownership of the software developed pursuant to it.

Bowns is a staff counsel with the state of California's public employees retirement system in Sacramento, Calif.

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The 12% Solution

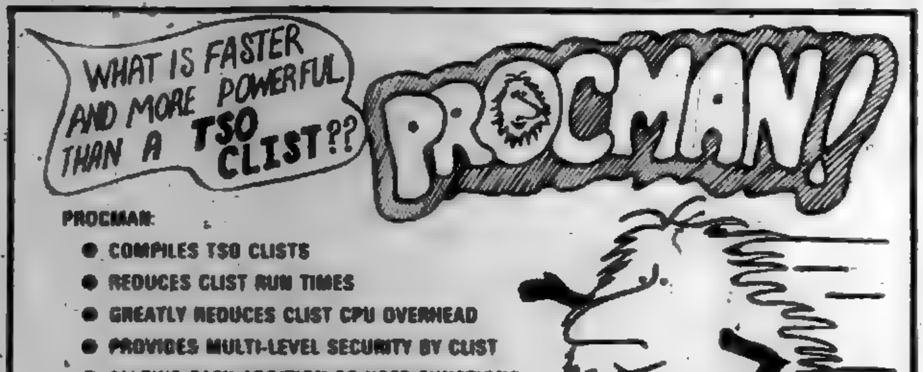
(Continued from Page 29)

on employed by one board member upon another who shows signs of being unwilling to have his ears plugged or eyes blinded).

It's conceivable that topics may arise that no one can hear, supported by documents that no one can see, in which case first-echelon employees will have to convene to consider them. This could ultimately result in an American variation on the laudable Italian business form wherein a virtual board handles the problems at hand while the real board dines in splendor at, say, Windows on the World.

But enough of this mischief! Bring on AT&T, the Japanese and whomever. The new confederacy of Intel with IBM, boardroom problems notwithstanding, gives us pause to reflect: It certainly would be interesting if IBM bought 12% of Motorola, Inc. next time around.

Lecht is president of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.



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DP Managers Pleased With Info Centers

ARLINGTON, Va.— The information center concept is alive and well at five firms whose DP managers recently discussed their successful implementations at the 1982 Infodata Systems, Inc. User Meeting here.

The panel consisted of Sam DeFazio of Gulf Research & Development Corp., Jim DeLong of Michigan Wisconsin Pipe Line Co., Bob Hutton of Union Carbide Corp., Valerie Martin of Sterling Drug, Inc., and Vijay Mathur of Blue Cross of Northeast Ohio. Harry Kaplowitz, executive vice-president of Infodata, moderated the discussion.

Discussing how the information center fits into their particular organizations, Mathur began by explaining, "At Blue Cross of Northeast Ohio we consider DP a manufacturing plant, producing bills or checks, while the role of the center is to provide services to the corporation and participate in setting its strategies."

"The Union Carbide [information center] was set up in support of IBM's CMS, primarily to provide engineers with productivity tools and let them know what additional DP tools are available," Hutton explained. "CMS has grown throughout the corporation but the role of the [information center] still is the same: it is there to help the users talk directly to the computer."

Martin noted that Sterling Drugs' information center is a service to end users who need a decision support activity. "We also work with people who might not have had contact with MIS [management information systems] in the past."

According to DeLong, "We organized our [information center] a year ago and now support 400 to 500 users, including 250 time-sharing users, 150 in office systems and 50 to 100 on micros. This work includes all graphics for the company, all office systems and personal computers."

The impetus to develop an information center in DeFazio's organization was intolerable application backlogs, some as long as two to three years, he said. In addition, users were buying minis to try to help dig themselves out of the backlogs.

"With such unstructured activity, the corporation felt computing was likely to become out of control so it was recommended that we establish two information centers, one at corporate headquarters and one in the research center," DeFazio said.

"Our biggest job was con-

(Continued on Page 34)

How Does Info Center Fit In Firm's Reporting Structure?

Where does the information center fit within a firm's basic reporting structure? Some DP managers replied.

At Union Carbide Corp., both information centers report to the manager of scientific applications development, Bob Hutton said.

At Michigan Wisconsin Pipe Line Co., the information center staff reports directly to an assistant vice-president, according to Jim DeLong. "Normally there is a director between a manager and a vice-president so it was a very positive point for the [information center] to report directly to a vice-president," he said.

"At Gulf, the [information center] is split between the central staff and respective user areas," Sam DeFazio noted. "Through a steering committee, the beneficiaries of the technology really 'own' the information center while Systems Development provides day-to-day operations, he said.

Candle Offers IBM Support

LOS ANGELES — Candle Corp. has announced IBM Fast Path support for its Omegamon and Dexan IMS performance monitors for IBM's IMS data base management system.

The modification features new exception reporting capabilities and additional commands. Exception reporting displays messages for Fast Path buffer serialization, buffer contention, region in wait for buffer and wait for output thread.

Operating requirements for IMS Level 1.1.5 or above run on IBM and plug-compatible mainframes running MVS.

The existing Dexan/IMS analysis will be extended to include Fast Path transactions and Fast Path specific degradation analysis, the vendor added.

Each package costs $19,500 from Candle Corp. at Suite 2404, 10880 Wilshire Blvd., Los Angeles, Calif. 90024.

Thorne Unveils Updated Recflow

ATLANTA — Thorne Data, Inc. has announced Release 3.0 of Recflow, a documentation aid for IBM users.

Recflow is said to print record layouts the way programmers draw them. It picks out records from Cobol programs and requires no changes or additions. The facility handles any type of Cobol record and includes improved handling of Occurs elements, the company claimed. Users may optionally select the print characters for both horizontal and vertical lines that separate fields.

The license fee is $3,000 from Thorne Data at 9320 Huntcliff Trace, Atlanta, Ga, 30338.

Integrated With Total

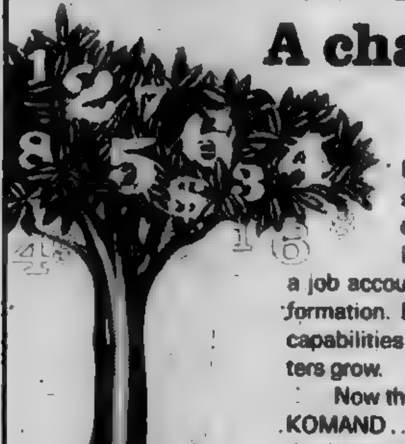
Cincom Query Aid Bows

CINCINNATI — Cincom Systems, Inc. has announced a query facility for its Total data base management system for Digital Equipment Corp. PDP-11 minicomputers running under RXS-11M.

Minicomputer Query is integrated with Total to navigate and extract data from different data sets without selectively viewing one file at a time, a spokesman said. The facility's extraction and reporting language allows output selection criteria to be based on factors ranging from simple comparisons to full boolean extraction logic. Output displays are available to a terminal.

Standard arithmetic operations reportedly include subtotals, subaverages, minimums, maximums, summary totals and averages of numeric data or derived fields. Multiple languages can be loaded and each user assigned an identification for a specific language.

The package costs $8,000 for PDP-11/23 and -11/24 users, $12,500 for PDP-11/34 to -11/60 users and $15,000 for PDP-11/70 users from Cincom at 2300 Montana Ave., Cincinnati, Ohio 45211.



A chargeback system that grows with you . . .

Because they're destined to grow, medium-sized IBM MVS and VS1 shops are often in a dilemma about software. Take job accounting, for instance. You need quality numbers in a job accounting system for true DP cost/utilization information. But most systems have too little quality, or capabilities you don't need, or become obsolete as centers grow.

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THE NS16000 MICROPROCESSOR FAMILY INCREASES SOFTWARE PRODUCTIVITY AND MAKES OTHER MICROS LOOK ARCHAIC.

Software productivity has become a major issue in computer-related product development. In microprocessor-based systems, software productivity centers around the capability of the microprocessor to maximize software utility relative to shorter development cycles, improved software reliability, and extended software lifecycles.

The degree to which the microprocessor can maximize software utility directly affects the cost of a product, its reliability, and time to market. It also eliminates future software modification for product enhancement or because of rapid advances in hardware technology.

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This microprocessor family combines 32-bit performance with demand paged virtual memory for efficient management of large address space. It facilitates high level language program development and efficient program execution. Floating point is also integrated into the architecture.

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When we began designing the NS16000 microprocessor family, we decided on a radical departure from existing architectures—designs that date back more than a decade.

While others extended 8-bit component technology upward to the system level, we weren't satisfied with that "bottom up" approach. Instead, we anticipated the computing needs of the '80s and '90s and took the time to extend sophisticated mainframe and minicomputer technology downward to the chip level.

The result is an advanced and efficient family of microprocessor hardware, software and development support products. Our entire NS16000 family offers everything you'd expect from powerful 32-bit machines and is easier to program and use than 16-bit "bottom up" micros.

Everyone who has evaluated the NS16000 recognizes its advanced architecture. We appreciate that response. Because it proves that the NS16000 family is exactly what we designed it to be—a solid foundation from which we can build solutions for your future designs while satisfying your needs for today.

NS16000. THE PROGRAMMERS' MICROPROCESSOR.

National Semiconductor

MICROCOMPUTER SYSTEMS DIVISION

DP Managers Laud Their Information Centers

(Continued from Page 31)

vincing corporate executives; we didn't have to market to the users at all," he continued. "If anything, our biggest problem was holding users back in order to keep from swamping our initial [information center] resources. We have 1800 potential end users, half of whom currently have access to the computer."

"The impetus for our [information center] came from the MIS group," Sterling's Martin noted. "We have a critical backlog and although management questioned whether users did want to do things themselves through an [information center], a one-year pilot study found that users needed help and were willing to learn to use [information center] tools themselves. Today Sterling is still a bit conservative in pushing the [information center] because we want to make very certain that we stay serviceable."

Mathur added that the impetus for his organization came from IBM. "At Blue Cross of Northern Ohio the Information Systems Group pushed hard for an information center and there was not much resistance from users." Asked how it is decided what work goes to the information center, Mathur replied, "Our [information center] is called Business Systems. Its role is to be the technology consultant to users. If a project is a large undertaking, it goes to traditional systems development."

"If an application is large enough and will be used by multiple areas, we may prototype it or just refer it to the corporate information systems development staff directly," DeFazio added."

Martin said, "We look for an aspect of do-it-yourself desire on the user's part. Since we do an in-depth needs analysis with each end user before a project is accepted by the [information center], we sometimes send users back one or even several times to rethink what they expect."

In terms of staff, DeLong's information center has 20 persons, three-fourths of whom are specialists in one or two products. "We currently have a 25:1 ratio of users to staff and a 2:1 ratio of products over staff," he said. Hutton added that his group has about 500 users per information center staffer.

Cost Savings Defined

Asked if the success of the information center in terms of cost savings can be pinpointed, Hutton said, "We have experienced a great deal of growth in the past year. In that time the number of CMS users we service has doubled and we typically have over 200 simultaneously active users each day. We don't see an end to this growth. Our backlog is not particularly high because, although the [information center] is very busy, we are staying ahead of the game."

According to Martin, "The biggest savings we have been able to identify from the [information center] is cost avoidance or the ability to use a tool already in place instead of buying a new tool. Users are getting three things: the right information at the right time in the right format."

DeFazio added, "The rate of growth in our [information center] has been so large that we at some point will be out of capacity. In the past seven months we have gone from 10 concurrent [information center] users to 130 users."

"We knew our [information center] was a success when the president asked for a terminal and a prompted Executive Information System. Thanks to the [information center], we expect that a full integration of DP into the corporate structure is at hand," Mathur said.

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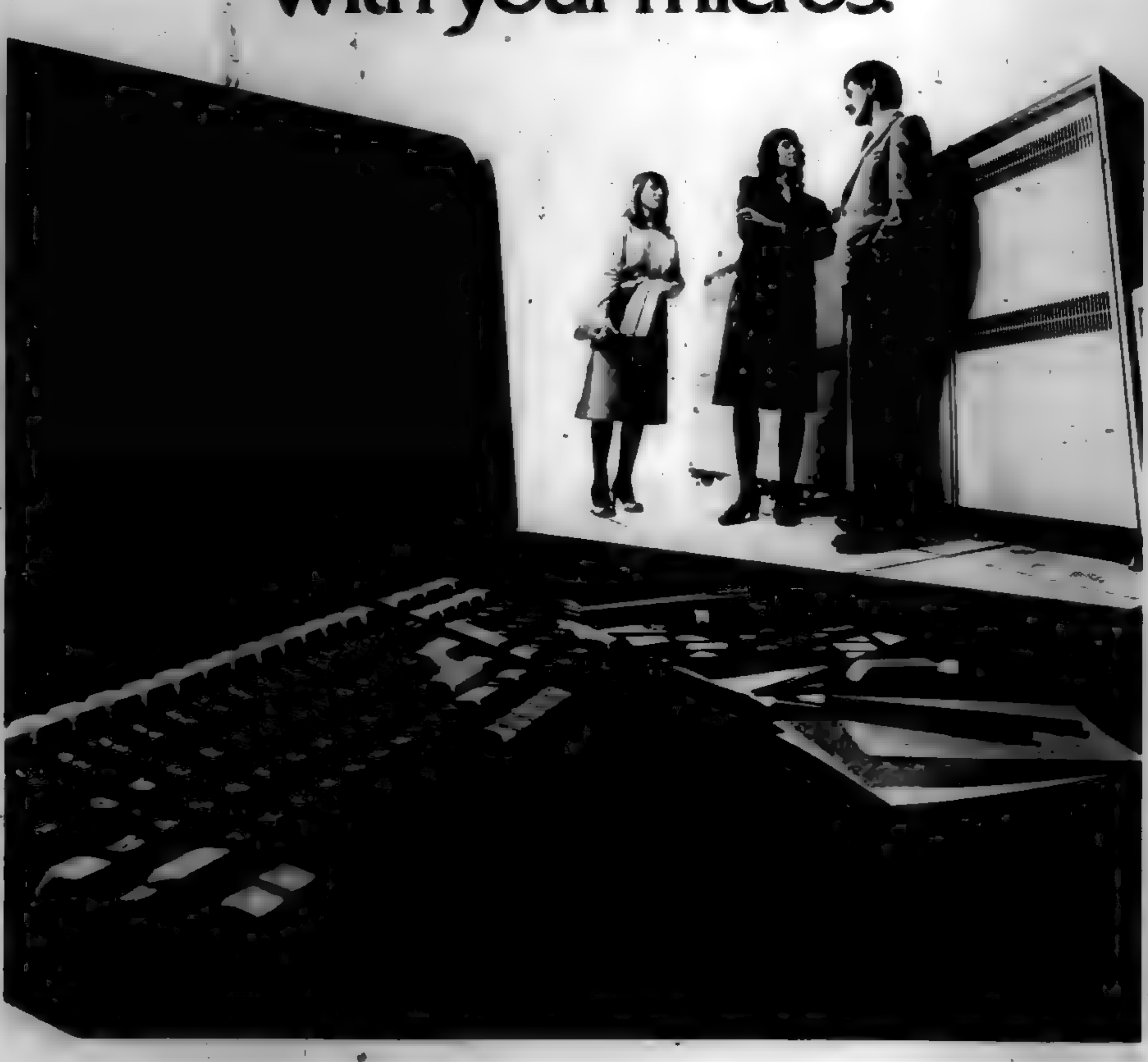


Responses, Techniques Vary

Managers Explain Role of Micros in Info Center

What role, if any, personal computers play in the information center was one question that was posed to four DP managers who have successfully implemented the concept.

Jim DeLong of Michigan Wisconsin Pipe Line Co. explained, "Our [information center] coordinates the acqusition of all [personal computers] by policy. Senior management doesn't particularly support micros because of the problems of data synchronization and integrity."

"At Gulf, we see the micro problem as twofold. First is the extraction of data from the central data bases and manipulation on a [personal computer]. The second problem is the flow of information from [personal computers] back into the mainframe system," Sam DeFazio of Gulf Research & Development Corp. explained.

"A local-area network may be the solution for us. With existing technology, someone can go to the central data base, pull off some information in a report, simply retype the report and make the numbers say anything. The issue of synchronization is a management issue."

Valerie Martin's group at Sterling Drug, Inc. conducted a survey and then drafted a policy statement regarding personal computer acquisition and usage. "Now we are reviewing educational needs of our [personal computer] users," she said.

"We handle the [personal computer] issue a bit differently at Union Carbide by maintaining a small organization, not a part of the [information center], to handle the [personal computer] user requests," Bob Hutton added.

Who Pays for Resources Of Information Center?

Who pays for the information center resources — data processing itself or the end-user departments that take advantage of the tools offered?

"Our [information center] is treated as a cost center or corporate overhead," Valerie Martin, DP manager of Sterling Drug, Inc., explained. "But we keep track of resource usage for each end-user project so we can show management where we're spending our time."

"We got our [information center] going by billing each division a portion of the [information center] costs and then sending bills listing individual usage of the computers," Sam DeFazio, DP manager of Gulf Research & Development Corp., offered. "However, in the last couple of months, everything basically has been charged back to the users for a total cost recovery. Users can also type 'Money' to see what a particular function has cost."

"Cost information is extremely important and our [information center] tracks everything, by man hours and computer cycles, for user charge backs," Union Carbide Corp. DP manager Bob Hutton asserted.

Michigan Wisconsin Pipe Line Co.'s organization charges computer costs to timesharing users only, according to DP manager Jim DeLong. "We are starting to bill all subsidiaries directly and soon we will start to bill for all manuals and training which means we will do more than just recover computer costs," he said.

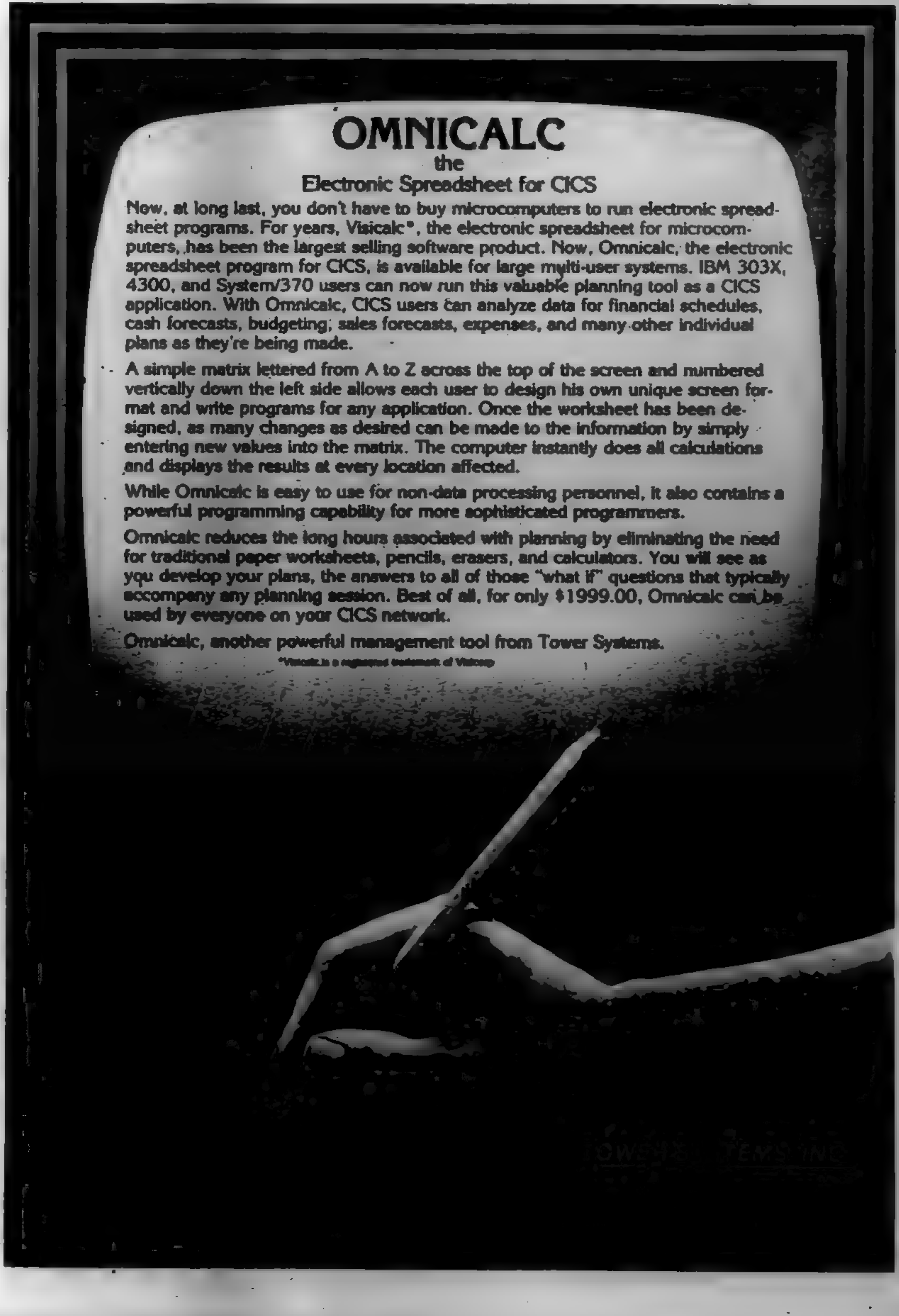
"Right now at Blue Cross, we feel it may be too early to charge users. Perhaps in three to four years we will be ready to take that step," DP manager Vijay Mathur noted.

FCS Announces Fixed-Price T/S For DP Service

WALTHAM, Mass. — Finreport Computer Services, Inc. (FCS) has announced the availability of fixed-price time-sharing for its IBM VM/CMS- and DOS/VSE-based computer service.

Called Optimum, the service reportedly provides each user with unmeasured use of the processor; all basic facilities of VM/CMS, DOS/VSE; other program products such as CICS/VS, Interactive System Productivity Facility, Remote Spooling Communications Subsystem networking; and a number of languages, including an enhanced IBM VS APL. Other items included in Optimum are provisions for storage and communication access to the host, RJE support and local and remote printing.

The average monthly use charge for Optimum is $1,500 per user, for a minimum term of 12 months. FCS, Inc. is located at One Moody St., Waltham, Mass. 02154.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Now, at long last, you don't have to buy microcomputers to run electronic spreadsheet programs. For years, Visicalc*, the electronic spreadsheet for microcomputers, has been the largest selling software product. Now, Omnicalc, the electronic spreadsheet program for CICS, is available for large multi-user systems. IBM 303X, 4300, and System/370 users can now run this valuable planning tool as a CICS application. With Omnicalc, CICS users can analyze data for financial schedules, cash forecasts, budgeting, sales forecasts, expenses, and many other individual plans as they're being made.

A simple matrix lettered from A to Z across the top of the screen and numbered vertically down the left side allows each user to design his own unique screen format and write programs for any application. Once the worksheet has been designed, as many changes as desired can be made to the information by simply entering new values into the matrix. The computer instantly does all calculations and displays the results at every location affected.

While Omnicalc is easy to use for non-data processing personnel, it also contains a powerful programming capability for more sophisticated programmers.

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Omnicalc, another powerful management tool from Tower Systems.

*Visicalc is a registered trademark of Visicorp

For Informatics' Smart/Dasd

Dasd Enhancements Announced

CANOGA PARK, Calif. — Informatics General Corp. has announced enhancements for its Smart/Dasd performance optimization package for direct-access storage devices (Dasd).

The package supports IBM and plug-compatible systems running OS and can be used with CICS, IMS and TSO, the spokesman said.

The enhanced version includes IBM 3380 migration and modeling capabilities to enable IBM or plug-compatible Dasd users to configure higher density devices, construct strings of least contending volumes and simulate performance based upon existing work loads, a spokesman said.

The package can be used with double-density drives, including Storage Technology Corp.'s 8650, Control Data Corp.'s 33502 and Memorex, Inc.'s 3652, the vendor said.

The cost is $10,000 from 21050 Vanowen St., Canoga Park, Calif. 91304.

PRO/grammar Offered On BCS Network

VIENNA, Va. — Boeing Computer Services Co. (BCS) has announced the availability of Pansophic Systems, Inc.'s PRO/grammar, a high-level language and report generator, on its telecommunications network.

PRO/grammar's features include the ability to compile and create object code directly from programmer-written statements. Users can also run PRO/grammar in a load-and-go mode for ad hoc requests and testing. The package logically groups a number of job activities into a single execution, a spokeswoman said. Program elements or entire programs can be stored in a macro file that lets users copy common code into applications and allows unlimited positional and keyword parameter substitutions.

PRO/grammar is available from BCS via its Mainstream remote computer services. Line speeds range between 300 and 4,800 bit/sec and dedicated access is available at 4,800 bit/sec. Prices vary widely based on processing, connect and storage costs, the spokeswoman said from 7980 Gallows Court, Vienna, Va. 22180.

Researchers Get BBN Tool

CAMBRIDGE, Mass. — A software system usable by nontechnical researchers that reportedly integrates data management, statistical analysis and graphics capabilities has been announced by Bolt Beranek & Newman, Inc. (BBN).

The RS/1 software is an electronic lab notebook for research and development, quality control and laboratory applications. Interfacing with other statistical packages, RS/1 runs on Digital Equipment Corp. VAX-11 and PDP-11 computers.

The software costs between $12,000 and $28,000, depending on options and computer size. BBN is located at 10 Moulton St., Cambridge, Mass. 02238.

TWG Eunice Release Enables VAX/VMS to Run Unix

PALO ALTO, Calif. — The Wollongong Group (TWG) has announced Eunice Release 3.1, an operating system which is designed to enable Digital Equipment Corp. VAX/VMS systems to run Bell Laboratories' Unix operating system.

Eunice 3.1 provides the Source Code Control System facility for control and access protection for program and documentation control, the vendor said.

Used in conjunction with VMS, Eunice enables VAX users to operate in a Unix environment using any Unix or VMS utilities or in a VMS environment with the ability to use all Unix tools with the VMS utilities. When using Unix compilers, users have a choice of generating either Unix or VMS object files, according to the vendor.

New features include support of all standard Unix file names, learn and games utilities and long file names up to 256 characters, a spokesman said.

A full screen editor, Ryan-McFarland Corp. RM/Cobol and TWG's Tabstar data base management system are available as options. Eunice is priced at $5,250 with availability in March from 1135A San Antonio Road, Palo Alto, Calif. 94303.

Performance Monitor Out For VAX-11s Running VMS

BOULDER, Colo. — Di Sys, Ltd. has introduced a system performance monitor for use with Digital Equipment Corp. VAX-11 minicomputers running VMS.

The System Performance Monitor is said to augment existing utilities and offer detailed, process-specific information. It is designed to aid in capacity planning and to give insight into system activities, a vendor spokesman claimed.

The monitor runs on all VMS VAX machines and supports Versions 2.0 and 3.0, according to the vendor spokesman.

It is available for $2,500, which includes three months of updates. More information is available from Di Sys, Ltd. 5375 Western Ave., Boulder, Colo. 80301.

Delta 4.7 Replaces Apex/SL Service

OVERLAND PARK, Kan. — United Information Services, Inc. (UIS) has replaced its Apex/SL Service permanent storage system with a new system.

The Apex/SL Service offers Control Data Corp. Cyber-based remote computing services. The new permanent storage system, the Delta 4.7, is said to be upwardly compatible and to allow such capabilities as 40-char. permanent storage names, cycled permanent storage families, tree-structured catalogue management and shared write access.

The Apex/SL is available on a time-sharing basis. UIS is located at 5454 W. 110th St., Overland Park, Kan. 66211.

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Recently, the Merlyn Corporation completed the industry's first exclusive study* on eight available ADS software systems. And this study clearly confirms what Cincom users already know. MANTIS is decidedly the winner.

Among the three most widely used systems—MANTIS, DMS and UFO—MANTIS *led every user satisfaction category:* productivity enhancement, on-line performance, ease of learning, ease of use, documentation, support and reliability. And in the most important category—"Overall Capabilities"—MANTIS was again the winner.

User satisfaction? 33% of DMS users said they would *not* recommend their system to others. Among UFO users, 6% would *not* recommend theirs. For MANTIS users, not one single user said no.

Further evidence of MANTIS' superiority is the overwhelming industry acceptance. In only 18 months since its introduction, MANTIS has gained 11% of the total ADS market share. That's a substantially higher growth rate than all of the other seven systems studied.

But while we're very pleased to be the runaway winner, we're even more pleased that MANTIS is becoming the industry standard for on-line programming. 84% of MANTIS users develop 91-100% of their applications with the system. Only 67% of DMS users reported such high usage. With UFO, the figure plummeted to only 48%.

These are merely the highlights of the conclusive Merlyn Study. But the findings are clear. When it comes to application development systems, MANTIS is in a class by itself.

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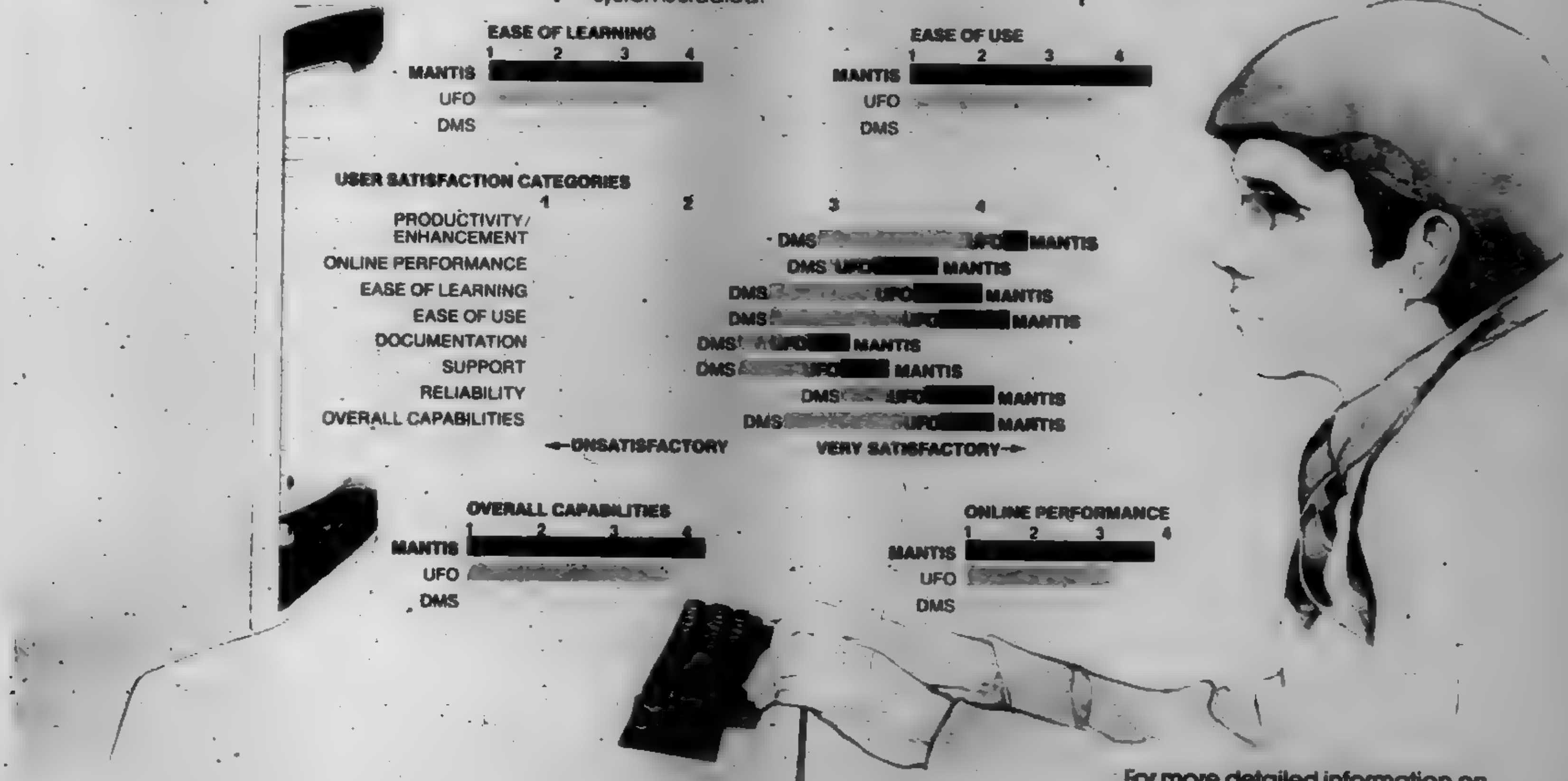

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* "CICS Application Development Systems: The Comparative Consumer Report." Written and published by MERLYN CORPORATION. Survey data from Focus Research Systems, Inc. 1982.

SAS/FSP Enhancement Provides Financial Help

CARY, N.C. — The recent SAS user group meeting was the launching point for an enhancement to SAS/Full Screen Product (FSP) called Fscalc.

The facility is said to provide SAS users with an interactive electronic spreadsheet for financial modeling and analysis. SAS Institute also noted that the SAS Color Graphics 100-Series Video Training Course has been added to the SAS Video Training Library.

The Fscalc procedure runs in a 32-bit environment to allow users to share their data on corporate hardware, according to SAS Institute.

Fscalc runs in Definition mode, in which users add, delete and move rows and columns and develop models; and in Run mode, in which users change their data and conduct "what if" analyses, the vendor explained.

The procedure has three screens. The spreadsheet screen reportedly allows users to define and display an infinite number of rows and columns. The program editor screen provides a full screen editor and supports line commands such as Find and Change. The message screen allows SAS to display messages regarding observations per track, error messages and completion codes.

Fscalc's features include unlimited spreadsheet size; a modeling language said to support most features of the SAS Data step, including arrays and macros; an on-line, menu-driven Help facility; a split-screen capability; and the facility to consolidate the current screen with a previously saved screen. The package also includes row and column operations; the use of color to highlight protected and unprotected fields; optional protection of every cell in the screen and automatic protection of function cells; and the ability to suppress row names when the spreadsheet is printed.

The Fscalc procedure will be available for beta testing in April, with the production release scheduled for mid-1983, the vendor noted. The procedure will be distributed automatically, at no extra charge, to SAS/FSP customers. SAS/FSP is available to corporate SAS customers in the U.S. for a first-year lease of $3,600. Each additional year is $1,800.

A preview package of the SAS Color Graphics Video Training course will be available in February, with distribution of the completed course scheduled for March 1983. The course contains eight modules which describe the basics of SAS/Graph.

SAS video products are licensed on a quarterly basis. The first-quarter rate for corporate customers is $2,000. Each additional year is $750.

SAS Institute is located at SAS Circle, P.O. Box 8000, Cary, N.C. 27511

Interpreter Out For Unix System

CAMBRIDGE, Mass. — Softshell, a full-screen command interpreter for Bell Laboratories' Unix operating system, has been introduced by Logical Software, Inc.

The interpreter runs on Digital Equipment Corp. LSI-11/23, PDP-11/24 and PDP-11/34 systems, as well as on the IBM Personal Computer.

It is intended to enable unsophisticated users to handle Unix's hierarchical file and command structure, while still providing the full power of the operating system for experienced users.

Software gives users the choice of entering commands directly in scroll mode or using the package's full-screen mode, which provides a list of Unix commands and options, the vendor said.

Softshell also was designed to allow users to distinguish directories from subdirectories through the use of rectangular windows calls panels, which graphically display Unix's hierarchical file structures.

Once a file or subdirectory is located, Softshell provides a focus facility that allows users to call up the contents of the file for a closer look, the vendor explained. This capability permits users to display and utilize lists of commands, directories and help and user files.

The package reportedly includes a C-language interface to the paneling routine designed to allow users to write programs to display and edit information in previously designed hierarchical structures.

The vendor noted that Softshell can be combined with its Logix relational data base management system.

A source license for Softshell can be purchased for $10,000. Sublicense fees for binary copies generated from the source range from $10 to $100 per copy, depending on volume. Logix users who purchase the Softshell software receive menu definitions for the Logix programs, the vendor reported.

Software will be available for delivery in February, the vendor said from 55 Wheeler St., Cambridge, Mass. 02138.

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Journaling and Security Facilities SEED's journaling capability keeps your data base uncorrupted. SEED also adds its own security features to those of your host computer to protect your information from unauthorized access.	✓		
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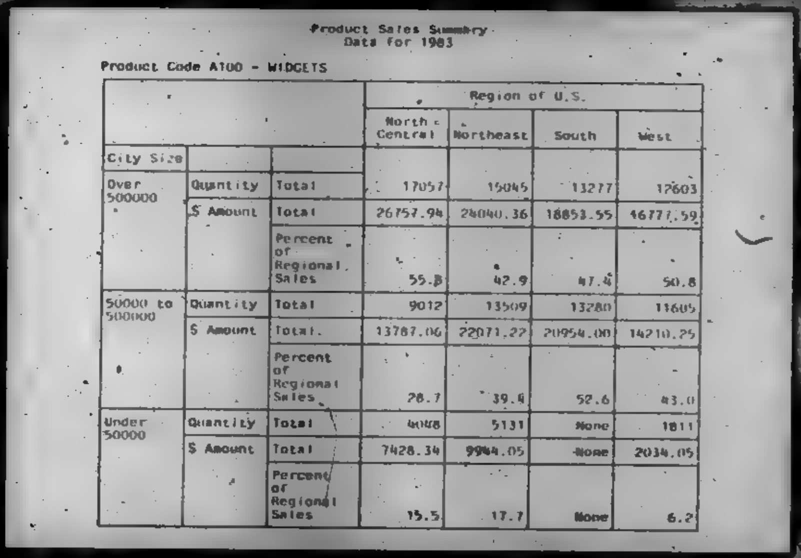

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Data for 1983

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			Region of U.S.			
			North Central	Northeast	South	West
City Size						
Over 500000	Quantity	Total	17057	15045	13277	17603
	$ Amount	Total	26757.94	24040.36	18853.55	16777.59
		Percent of Regional Sales	55.8	42.9	47.4	50.8
50000 to 500000	Quantity	Total	9012	13509	13280	11605
	$ Amount	Total.	13787.06	22071.22	20954.00	14210.25
		Percent of Regional Sales	28.7	39.4	52.6	43.0
Under 50000	Quantity	Total	4048	5131	None	1811
	$ Amount	Total	7428.34	9944.05	None	2034.05
		Percent of Regional Sales	15.5	17.7	None	6.2

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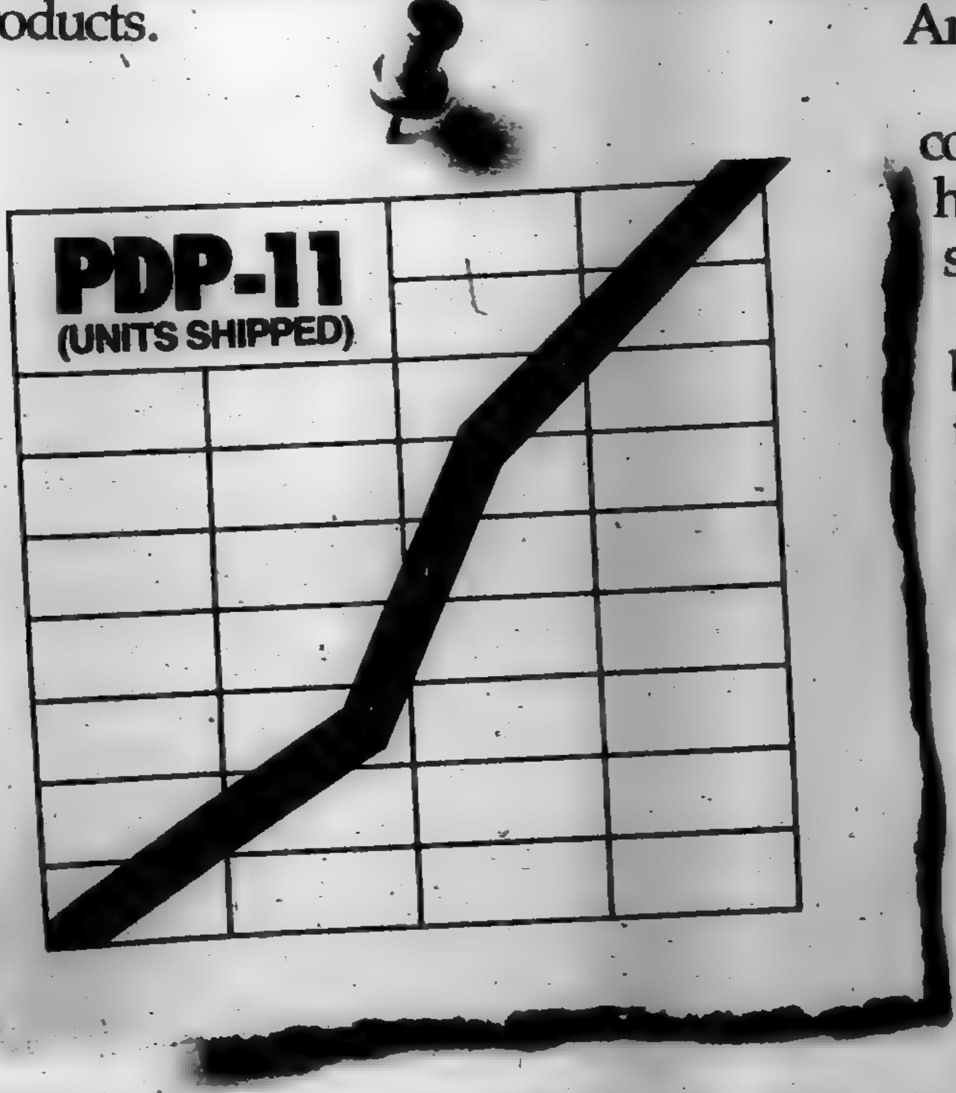

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For OS/VS1, MVS Systems

'OMS/Monitor' Provides On-Demand Info

JERICHO, N.Y. — Computer Associates has integrated an on-line task manager with its CA-TLMS II tape library management system and CA-Manage/Dasd direct-access storage device data set management products for IBM OS/VS1 and MVS systems.

OMS/Monitor provides communications between the products and makes abend and status information available on demand, a spokesman said. When used in conjunction with CA-TLMS II Release 4.0 and CA-Manage/Dasd Release 2.2, it is possible to achieve dynamic restoration of data sets, eliminating program abends due to lost or archived data sets, according to a vendor spokesman.

OMS/Monitor reportedly allows both products to share one address space, the spokesman added, and it automatically determines which data set management product is being addressed.

CA-Manage/Dasd has also been enhanced to include volume compression and an idle space release feature that increases the usable Dasd disk space. The new relase also supports VS1, Indexed Volume Table of Contents and 3375 and 3380 disk drives.

CA-TLMS II is priced at $15,000 for a three-year lease. CA-Manage/Dasd costs $7,000 for a three-year lease. The combined packages cost $20,000. OMS/Monitor is available at no charge with other OMS series products from 125 Jericho Turnpike, Jericho, N.Y. 11753.

Tools Out for Global Ledger System

RALEIGH, N.C. — Global Software, Inc. has announced new on-line tools for its Global General Ledger System for CICS-based IBM mainframes running Cobol programs.

The company also announced the General Ledger and Financial Reporting Package for users of IBM System/38.

On-line data entry and inquiry has been added to Global General Ledger, the company said. Other enhancements include Quick Close, which allows adjustments and updates of accounting reports on a real-time basis. Profit Planning and Budgeting allows what-if planning and forecasting with time series and bivariate regression analysis available interactively, according to a vendor spokesman.

The Real-Time Reporter offers specification and execution of reports on-line, a spokesman said. Features include propagation of existing reports with minor changes and scan review, the spokesman said.

A graphics enhancement provides an interface with the IBM Graphical Data Display Manager and offers line graphs, scatter plot graphs and bar charts. Price ranges from $45,000 to $90,000.

The System/38 General Ledger and Financial Reporting package is a real-time system that includes use of data base structure and RPG-III, externally defined files, no sorting, practical user of logical views and a procedure monitor to improve system integrity, the spokesman said.

The product costs from $35,000 to $43,000. Both packages are available from Global Software at 1009 Spring Forest Road, Raleigh, N.C. 27609.

MCBA Offers 'SPC' in Dibol For PDP-11s

MONTROSE, Calif. — Mini-Computer Business Applications, Inc. (MCBA) has announced Standard Product Costing (SPC) written in Dibol for Digital Equipment Corp. PDP-11s.

As the latest addition to the MCBA manufacturing system, SPC is an interactive tool said to maintain standard or estimated costs for both manufacturing and accounting management.

SPC reportedly maintains up-to-date costs for all products, parts and services provided by a company. SPC requires MCBA's Inventory Management (I/M) and Bill of Material Processor (Bomp) packages.

A source code license for MCBA's RT-11 SPC is $3,000 for one computer and $4,000 for a 10-computer license. The RT-11 I/M and Bomp are $4,000 for one use and $5,250 for a 10-use license, according to a vendor spokesman. MCBA is headquartered at 2441 Honolulu Ave., Montrose, Calif. 91020.

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* "Competitive Product Analysis of Decision Support Systems"
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Warehouse Management Tools Run on VAX

LEXINGTON, Mass. — Distribution Management Systems, Inc. (DMS) has announced two software packages for distribution and warehouse management of finished goods inventories. The DMS-1000 Distribution System and DMS-1500 Warehouse Management System run on Digital Equipment Corp.'s VAX series of computers.

The packages are said to include the capability to support remote and hand-held terminals, bar code readers and labelers. In addition, they can provide control of multiple distribution centers on a centralized or distributed basis.

DMS-1000 handles order processing, inventory management and billing, the vendor said. It also generates the information required for accounts receivable systems. Optional modules include accounts receivable, physical inventory support, requirements planning, finished goods inventory replenishment, general ledger, purchasing, accounts payable and budgeting.

The DMS-1500 handles order entry, receiving, inventory location and management, picking, packing and shipping. It can be interfaced to centralized order processing and billing systems and to automated materials handling systems and can serve as an adjunct to the DMS-1000.

The package includes first-in, first-out accounting support, serial and lot number controls and picking and shipping features. An optional module provides the ability to track and analyze warehouse performance.

The DMS-1000 starts at $130,000 and DMS-1500 starts at $75,000, the vendor said from 81 Hartwell Ave., Lexington, Mass. 02173.

Claims Processing System Designed for Decsystem-20

SPARTA, N.J. — Insurance Network Systems, Inc. has developed a Universal Policy Issuance and Claims Processing System that was designed to run on the Digital Equipment Corp. Decsystem-20 series of computers.

Aimed at property and casualty insurance carriers, managing general agencies and self-insureds, the online system was designed to handle a series of services including: business owners, workers compensation and commercial auto coverages on a national basis, Insurance Network Systems said.

The system is said to maintain a policy data base, print policies and process endorsements, cancellations, reinstatements and rewrites.

For purchase, the system costs between $20,000 and $80,000, depending on functions, according to the vendor.

On a time-sharing basis, customization costs between $20,000 and $80,000 with monthly charges on an as-used basis.

Insurance Network Systems is headquartered at 3 Theater Center, Sparta, N.J. 07871.

Cobol Tool Out For Burroughs

MINNEAPOLIS — Technalysis Corp. has announced the Compiler Optimizer Package (COP) for Cobol programmers working on Burroughs Corp. B-1700, B-1800 and B-1900 computers.

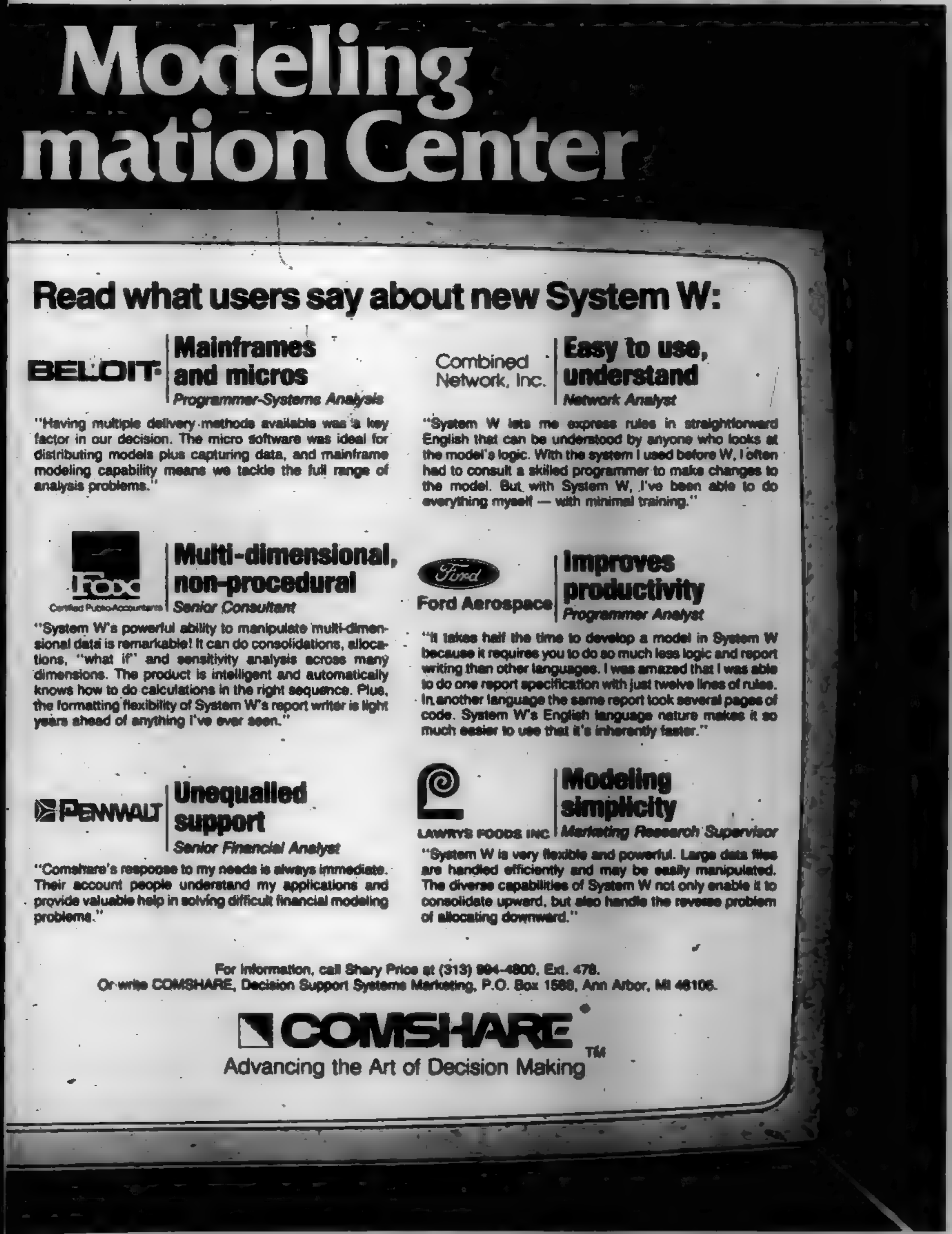
The COP interrogates the operating system whenever a Cobol compile is executed to determine available resources and current disk and memory utilization, according to Technalysis.

It then dynamically optimizes the Cobol compiler, the company claimed.

A compile mix limit can be set and a queuing technique automatically regulates the mix limit and priorities of compiles in the mix or waiting to be executed.

The product also prevents contention between compiles and on-line programs.

A one-time charge for the program is $2,000 from Technalysis. The firm is located at 6700 France Ave. S., Minneapolis, Minn. 55435.



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Computer Security Package Announced for VAX-11/780

ATHENS, Ga. — A computer security package for the Digital Equipment Corp. VAX-11/780 has been announced by Cosmic, Inc., the dissemination center for software developed by the National Aeronautics and Space Administration.

The package includes four components. Autobaud adjusts the baud rates and allocates remote terminal lines. If a remote terminal is not logged in, Autobaud performs periodic hangup. Monitor examines all terminals every 15 minutes and logs off users who fail to perform any CPU activity after a specified period.

Guardian records data on every unsuccessful log-in. On multiple unsuccessful attempts, Guardian performs hangups and logouts and signals an alert. Inspect allows examination of suspicious processes.

The source code for the four programs costs $580 from 112 Barrow Hall, University of Georgia, Athens, Ga. 30602.

System/34 Gets On-Line Mail Aid

CARSON CITY, Nev. — An on-line mailing package for the IBM System/34 has been developed by Systems Design Consultants.

Dynamic Mailer maintains basic name and address information, phone numbers and category fields. On-line functions include edit and update, inquiry, alpha search, user-defined edits and report selection.

The software costs $199 including source code and documentation from the firm at 625 Fairview, No. 117, Carson City, Nev. 89701.

DBMS Offered for PDP-11

ARLINGTON HEIGHTS, Ill. — International Software Enterprises (ISE) has released a post-relational data base management system for Digital Equipment Corp. PDP-11 series computers running under RSX-11M and most popular microprocessors.

Micro Data Base Systems (MDBS) III reportedly supports semantically oriented data structures and can also be used to define older architectures. Facilities include data compression and encryption, nine types of data fields, automatic security checking and feasibility range checking for any field's values.

Three languages are available for interfacing with an MDBS III data base. The Data Manipulation Language (DML) has commands for both record-at-a-time processing and for generating entire collections of records satisfying desired criteria. DML commands can be invoked from within applications written in C, Fortran, Basic +2 or Macro 11.

Pricing depends on options, with the RSX-11M version of MDBS III ranging from $7,000 to $14,000. The Digital Research, Inc. CP/M version starts at $2,400, the MP/M-86 version ranges from $4,200 to $5,500 and the Altos Computer Systems, Inc. 8600 version ranges from $5,000 to $6,675. The company is located at 85 W. Algonquin Road, Arlington Heights, Ill. 60005.

Security Tools Fit HP Micros

MOUNT HOLLY, N.J. — Structured Software Systems, Inc. has announced two software security packages for use with Hewlett-Packard Co. desktop computers.

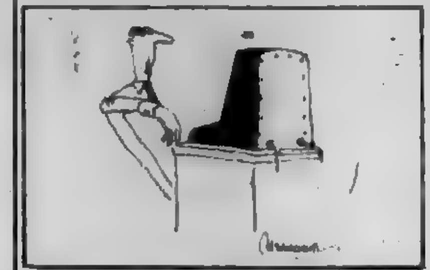
SEC36 runs on HP 9836 and 9826 computers. It protects Basic programs that are distributed on HP standard minifloppy disks by "fingerprinting" the disks with special security codes, a spokesman said. The codes are checked by an assembly language subroutine that is appended to each application program that is to be protected. Protected program copies to a nonfingerprinted disk cannot be successfully loaded.

During encipherment, SEC36 removes comments and deletes the names of all program symbols, reducing memory requirements, the spokesman added. The package costs $4,000.

Dsec87 runs on the HP 86 and HP 87 computers with standard 5¼-in. flexible disks. The package prevents listing the protected program and prevents copies from running unless the original disk is physically mounted in the drive.

The two-part system consists of treated disks containing an embedded identification key that is unique for each Dsec87 owner and user. The package prevents listing, tracing, merging and any other revealing access to secured programs by any system routines, the spokesman said. The package costs $1,500.

Both are available through Box 1072, Irick Road, Mount Holly, N.J. 08060.



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'Aegis' Limits CPU Access

NEW YORK — A software package that limits on-line access to computers to maintain the security of data has been announced here by Cornell Computer Corp.

Aegis allows on-line access to authorized personnel who are using authorized terminals at authorized hours of the day on authorized days of the week, the vendor said, referring to the products' four levels of security.

This product operates on IBM mainframes and plug-compatibles. It costs $17,500, from the vendor at 363 Seventh Ave., New York, N.Y. 10001.

Aid Targets VAX/VMS

ATLANTA — Raxco, Inc. has announced the availability of its Rabbit-2 Performance Analysis for Digital Equipment Corp. VAX/VMS Release 3.0 and above.

Rabbit-2 is an interactive performance analysis system developed for PDP systems running under RSTS/E and RSX11M+. The software is said to generate graphics displays of computer resource demands through an interactive English-like command language.

New features include image or program analysis, specification of time intervals and time periods and automatic display of the program resource demands placed on the system.

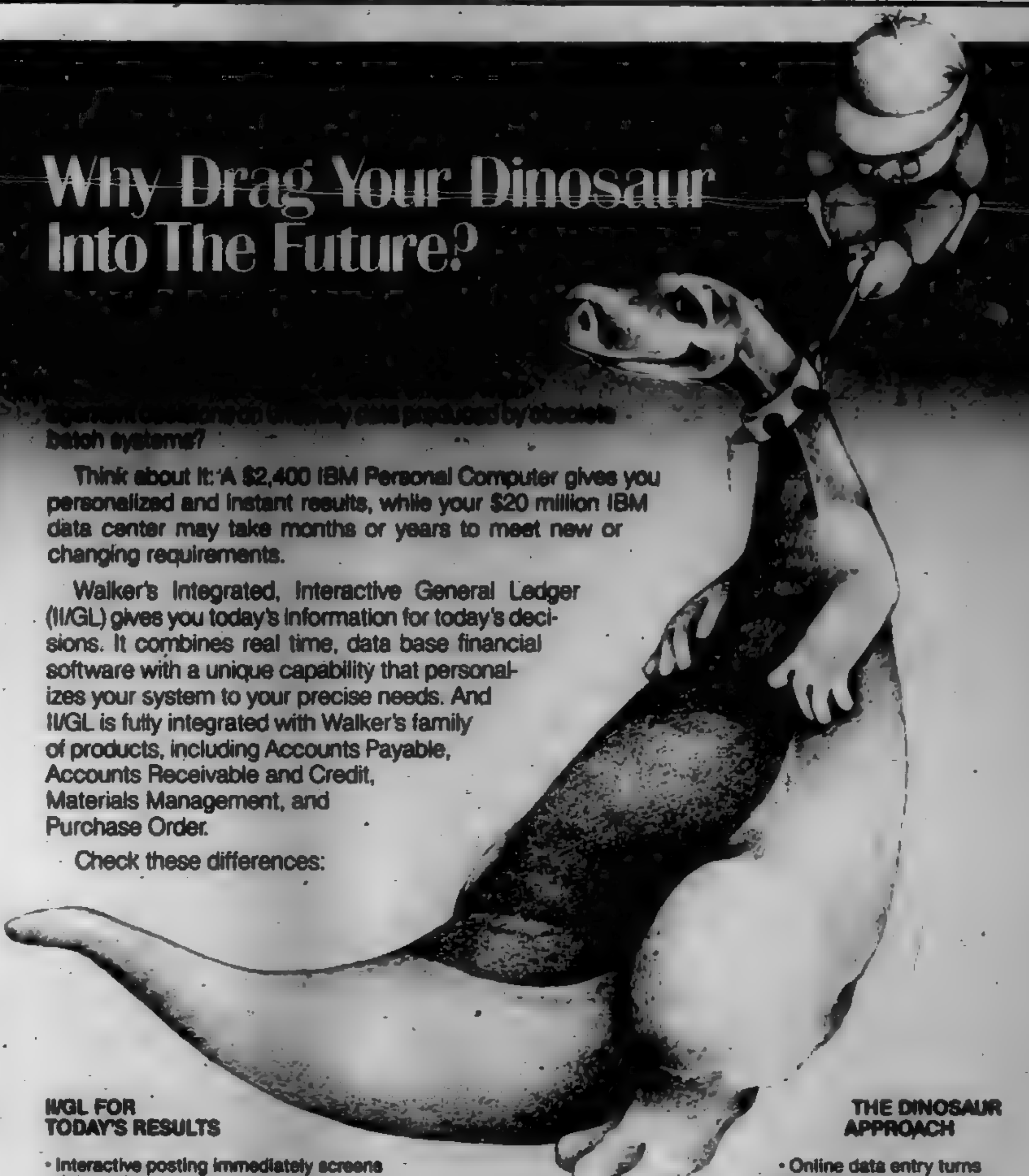
VAX Rabbit-2 may be purchased for $3,995 or rented for $200/mo from the firm at Suite 200, 6520 Powers Ferry Road, Atlanta, Ga. 30339.

'Security-II' Fits Gcos

MECHANICSBURG, Pa. — Caci, Inc.-Federal has announced an on-line security package for users of Honeywell, Inc.'s Data Management IV Transaction Processing data base management system. Security-II runs on Honeywell Level 66 and DPS 8 systems under Gcos operating system software

Identification codes and passwords are used, and permissions can be restricted to query or update for a given user/transaction as defined by the security administrator, the company claimed.

The package costs $7,300 from Caci's Advanced Systems Department, 5010 Trindle Road. Mechanicsburg. Pa. 17055.



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☐ Purchase Order

Micro Notes

Radio Shack has announced an enhanced version of Visicorp's Visicalc spreadsheet planning package for its TRS-80 Model II microcomputer. **Visicalc Enhanced** generates larger spreadsheets by utilizing any additional memory, a spokesman said. New features include an entry editor, logical and comparison operators and built-in math functions. The program can also produce and store simple graphs. A 64K-byte memory expansion board, priced at $399, improves package performance, the spokesman said. Visicalc Enhanced costs $299 from 1800 Tandy Center, Fort Worth, Texas 76102.

Selva Systems, Inc. has released **Graphics Language for Microcomputers (GL/M)**, a Digital Research, Inc. CP/M-based package which the company claimed turns popular word processing printers into intelligent graphics output devices. The initial version supports Xerox Corp. 620, 630 and 1600 series, NEC Spinwriter 7715 and 7725 and Epson America, Inc. MX-80 and MX-100 printers.

The package produces bar, line, pie and flow charts, histograms, figures and illustrations, a spokesman said. Single commands can change size and aspect ratio and thumbnail graphs can be integrated with text.

The package requires 64K bytes of memory, CP/M, two disk drives and a printer and costs $295 from Selva at 167 Worcester St., Wellesley, Mass. 02181.

EEC Systems, Inc. has announced the availability of the **LEX-11** word and data processing package on the Digital Equipment Corp. Professional microcomputer under the P/OS operating system. The package includes full screen editor, list processing, data base management, business graphics and a visual calculator and costs $850. An introductory on-line training guide costs an additional $200 and a spelling checker is also priced at $200. The company is located at 327/E Boston Post Road, Sudbury, Mass. 01776.

Businessoft International Corp. has introduced a three-dimensional spreadsheet package for microcomputers running Digital Research, Inc.'s CP/M 80 or CP/M 86 operating system. Called **Wondercalc**, the package reportedly features three-dimensional business algebra, separate Manager's and Data Entry modules and a variety of formatting options for business reports and graphs.

Wondercalc processes spreadsheets of up to 998 rows and 99 columns depending on available memory, a spokesman said.

The three-dimensional business algebra feature performs three-dimensional consolidation or arithmetic operations on forms, the company claimed, creating total, average, standard deviation and count of data entered cells.

The package requires a 24 by 80 display, 64K bytes of memory, two disk drives and a printer. The Manager's Module costs $395 and the Data Entry Module costs $195, the vendor said from 24 Jean Lane, Monsey, N.Y. 10952.

Decision Resources has announced an expanded version of its **Chart-Master** business graphics package for the IBM Personal Computer using Hewlett-Packard Co. plotters. This version offers on-screen previewing of charts, multiple character fonts and new chart types. The enhanced product costs $375. The vendor can be reached through P.O. Box 309, Westport, Conn. 06881.

A language system called **Hemenway/Forth**, which reportedly enhances the software development capabilities of the Motorola, Inc. MSP/68000 real-time, multitasking operating system, has been announced by Hemenway Corp. Prices start at $115, the vendor said from 101 Tremont St., Boston, Mass. 02108.

Ramtek Expands Program

SANTA CLARA, Calif. — Ramtek Corp. has added 10 vendors to its Software Affiliation Program. Members of the program provide computer-aided design and manufacturing software that runs on Ramtek's RM-9460 and Marquis graphics and image display systems.

Marquis and the RM-9460 are Zilog, Inc. Z80- or Motorola, Inc. 68000-based display generators with resolutions of 1,280 by 1,024 pixels and have the ability to display 256 simultaneous colors. Both systems run on Digital Equipment Corp. VAX computers.

The new members and their offerings are: MacNeal Schwendler Corp. (MSC/Grasp, finite element pre-/post processor); Swanson Analysis, Inc. (Ansys, finite element pre-/post processor), Georgia Tech (GTStrudl, finite element pre-/post processor); University of Southern California (Post, finite element pre-/post processor and kinetic analysis for Cosmo); General Electric-CAE (Structural Dynamics Research Corp.) (Supertab, finite element pre-/post-processor and kinetic analysis); Manufacturing and Consulting Services, Inc. (Anvil-4000, mechanical design, drafting and manufacturing); Design Information Systems, Inc. (DIS/Adlpipe, pipe stress analysis); Structural Programming, Inc. (Mapps, project management; Palette, two-dimensional drafting and three-dimensional modeling); University of California-Berkeley (Spice, circuit simulation; KIC, input for Spice); and Silvar Lisco (Gards/SDS, gate array design; CAL-MP, MOS circuit design).

Ramtek is located at 2211 Lawson Lane, Santa Clara, Calif. 95050.

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Emulator Links IBM 3101 Terminals To Host Using 3270

MIAMI — Innovative Electronics, Inc. has announced the MC-80/600-03, a device that reportedly emulates IBM 3277 and 3278 display terminals using an IBM 3101 terminal.

The emulator allows 3101 terminals to communicate with an IBM host processor using 3270 binary synchronous communications (BSC) protocols. The unit emulates an IBM 3270 BSC controller with one or two ports available for any combination of display stations or printers. In addition, the unit can be used in place of several IBM control units, including the 3271 Models 1 and 2, the 3276 Models 1 and 2 and the 3274 Model 51C, the vendor said.

The MC-80/600-03 comes with 16K bytes of read-only memory and 16K bytes of random-access memory. A single-port unit costs $1,495. A two-port version costs $1,695. A modem-sharing option costs $300, the vendor said from 4714 N.W. 165th St., Miami, Fla. 33014.

Emulating Controllers Link Firm, 'Far-Flung' Workers

SUNNYVALE, Calif. — Terminal controllers that allow Ascii terminals to access IBM 3270 applications programs by emulating 3270 controllers helped Boole & Babbage, Inc. to link its far-flung network of employees while saving time and money.

Many companies with headquarters in one city provide service to customers via staff in branch offices located across the country. Relying on an IBM mainframe computer at the home office for important information, employees located elsewhere need a way to access the computer.

An IBM 3270 terminal provides obvious access. However, prohibitive costs of the hardware equipment and leased lines, as well as their limited availability, are causing many managers to look elsewhere for more cost-effective access methods.

Robert Ford, vice-president, engineering, at Boole & Babbage, is one manager who found a solution.

Boole & Babbage employs a staff of highly trained software engineers. The company and its centralized IBM 4300 computer are located here in Sunnyvale but many of its engineers are not. Located as they are in other cities throughout the country, these engineers develop IBM applications programs such as IMS, CICS, TSO and SPF, necessitating daily access of the computer for several hours at a time.

A few of the engineers have terminals using IBM 3270 protocols, providing access. Most do not. Realizing that the purchase of IBM hardware and leased lines for remote communications would be expensive, Boole & Babbage began a search, headed by Ford, for a cost-effective solution to its problem.

Ford realized that relocation to Silicon Valley was not the answer. "Many of our engineers have families and are settled in their homes. And, plainly speaking, relocation costs can be prohibitive, especially in the Silicon Valley area," he said.

The solution to the problem was found in T7 and T8 Terminal Controllers, manufactured by Datastream Communications, Inc., Santa Clara, Calif.

Datastream's controllers allow

(Continued on Page 48)

Transmits at 168K Bit/Sec

GDI Announces Network Mux

NEW YORK — An asynchronous/bisynchronous network multiplexer that is said to move data faster and more efficiently than any other available product was introduced here by General Datacomm Industries, Inc. (GDI) recently.

Called GEN-NET 1262, the product is capable of transmission speeds up to 168K bit/sec on up to four composite links and has high buffer storage and 96-channel expansion capability, according to GDI.

The unit is available in either eight- or 24-channel modes and features down-line and up-line loading, front-panel programming in English and the elimination of internal strapping, switching and crossover cables, the company said.

GEN-NET's components include two plug-in printed circuit cards and a power supply in either 3½-in. or 7-in. rack-mount enclosures. The multiplexer also features nonvolatile memory, automatic channel programming upon insertion, full flow controls, multiple aggregates, local echoplex, password protection, channel priority, built-in diagnostics and dial-up modem support, GDI noted.

The basic unit, excluding channels, is priced at $5,400. Each channel is priced at $250. First shipments are scheduled for March. More information is available from GDI, One Kennedy Ave., Danbury, Conn. 06810.

Sharing Device Links Four Units

SASKATOON, Sask. — Develcon Electronics, Ltd. has announced a data channel sharing unit said to permit up to four data communications devices or terminals to share a single channel to the host computer in a local data environment.

The Model DS848A accepts both synchronous and asynchronous operations at speeds up to 19.2K bit/sec. It can be configured as a four-into-one modem-sharing or port-sharing unit, according to a spokesman.

The user can link four devices to the DS848A to share a fifth channel. Polling messages from the common channel are broadcast to all four devices. When one device responds, it is granted a private communications path to the common channel for the duration of its message, the vendor said.

The DS848A is available in both a desktop model, costing $920/unit, and a 19-in. rack-mountable (DS848AR) model for $875/unit. Develcon Electronics is located at 856-51st St. E., Saskatoon, Sask., Canada S7K 5C7.

Package Converts Ascii to IBM SNA

WOODLAND HILLS, Calif. — Protocol Computers, Inc. has introduced a protocol conversion software package that allows Ascii conversion to IBM 3270 Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) through X.25.

The 1076X/73SX is a pair of interfaces said to permit micros, personal computers, Ascii CRT terminals, hardcopy keyboards printers and other Ascii devices to communicate with an IBM SNA/SDLC host through X.25 public packet networks.

The interfaces are sister units that work in tandem on opposite sides of the X.25 network. The 1076X provides the link between the X.25 network node and Ascii terminals. The 73SX interfaces between X.25 and the SNA/SDLC host that appears to the host as up to eight IBM 3274 SNA/SDLC controllers.

The 1076X starts at $4,500; the 73SX costs $5,500 from Suite 100, 6150 Canoga Ave., Woodland Hills, Calif. 91367.

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Ramtek Expands 6211 Terminal Unit

SANTA CLARA, Calif. — Ramtek Corp. has introduced three versions of its 6211 Colorgraphic terminal, which was designed for business graphics, process control and command and control applications.

The three versions are the rack-mounted model (R6211), the 40 Hz interlaced long-persistent phosphor version (6211-03) and the 6221 Colorgraphic Terminal with Digital Equipment Corp. VT100 compatibility.

The rack-mounted version is a raster scan color graphics terminal costing $3,995 minus the monitor. The long persistent phosphor version is said to give high-quality resolution for $4,995 and the 6221 contains 6211 features with VT100 compatibility for $5,995 from 2211 Lawson Lane, Santa Clara, Calif. 95050.

Controllers Help Firm Access Programs

(Continued from Page 47)

Ascii terminals to access IBM 3270 applications programs by emulating the IBM 3270 controllers to the host computer. The T7 controller works with up to two binary synchronous communications (BSC) line disciplines at speeds up to 9,600 bit/sec.

The T8 controller operates in point-to-point, multipoint and switched System Network Architecture (SNA) networks emulating an IBM 3274-XC controller. The T8 can also be directly connected to 370 processors.

Datastream controllers support multiple terminals and feature dial-in password security, dual host support and remote dial-in diagnostics.

Reduced Phone Costs

The Datastream controllers also reduce telephone costs by allowing dial-up access rather than using leased lines. Engineers from thousands of miles away can dial into the Datastream controllers from their telephones to access the appropriate CICS, IMS or TSO applications at the Sunnyvale headquarters. This dial-up capability is not available with IBM 3270 terminals,

According to Ford, the Datastream solution provided significant benefits, not the least of which is a 75% reduction in costs. "It's made program development via telecommuting a practical, low-cost reality for us," he said. The firm supplies each engineer with an Ascii CRT terminal costing about $600 and an acoustic coupler.

Boole & Babbage is now realizing record throughput with a reduction in development time as well. "The simple dial-in convenience of this approach gives us great flexibility in configuring networks efficiently," Ford noted.

The company is currently testing customer service lot programs in its Chicago, Dallas and New Jersey branches for use by field systems analysts.

Here too, Ascii displays allow inexpensive, real-time access to critical market information from the home office

Using portable terminals, system analysts can easily transport them for on-site relay and access of pertinent information.

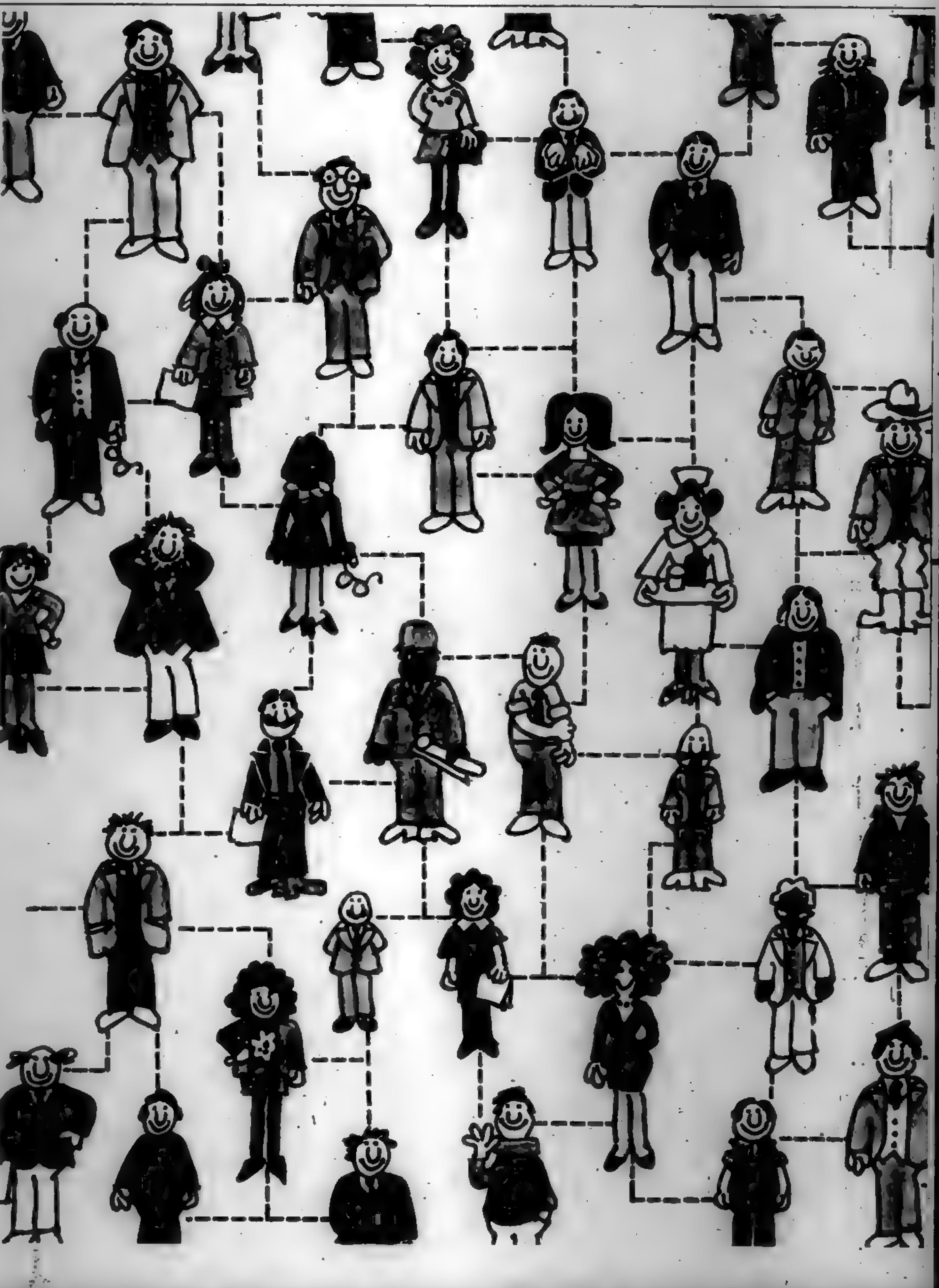
"Datastream controllers provide us with more than we had expected," Ford said. "We ended up with greater flexibility in networking, portability and reduced costs."

Terminals Get Ansi X3.64

ARMONK, N.Y. — Tandberg Data, Inc. has introduced a block transmission capability to its line of smart terminals.

The block transmission is said to follow the Ansi X3.64 protocol exactly.

The terminals cost $1,875 from the firm, which can be contacted through P.O. Box 99, Labriola Court, Armonk, N.Y. 10504.



Honolulu to Switzerland

WUI Communications Expanded

NEW YORK — Western Union International, Inc. (WUI) has expanded its Database Access and Remote Computing Communications Service (DBS) to provide service between Honolulu and Switzerland.

The service is being provided in conjunction with Radio-Suisse S.A. of Switzerland. DBS uses packet-switching technology to provide terminal-to-computer and computer-to-computer communications internationally.

WUI, a wholly owned subsidiary of MCI Communications Corp., provides telecommunications services, including telex, cablegram, leased line, facsimile and datel, in addition to data base service.

Fees are on an as-used basis. WUI is headquartered at One WUI Plaza, New York, N.Y. 10004.

Atlantis Offers Monitor

MINNEAPOLIS — Atlantis Corp. has introduced a 12-in. amber phosphor data monitor with 800-line resolution and a 16M Hz bandwidth.

The ADP-120A features ac/dc operation and an input impedance termination switch.

The monitor is available for $169 from Atlantis Corp., 720 29th Ave. S.E., Minneapolis, Minn. 55440.

Communications Tool Out For CP/M, MP/M Systems

NEWARK, Ohio — The Information People has introduced a communications software package said to offer information exchange between microcomputers running the Digital Research, Inc. operating systems CP/M or MP/M and a central MP/M system.

Infoshare is said to offer many of the advantages of a star network and allow centralized storage of data. A remote microcomputer can be used to exchange information with an unattended host MP/M system. The remote may also be operated as an MP/M console in the same system.

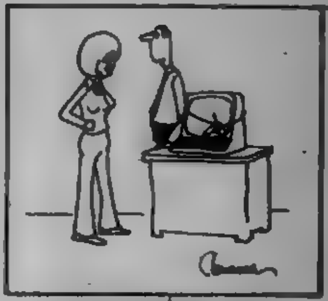
Suggested one-time charge for a system license is $250, available from The Information People, 443 Hudson Ave., Newark, Ohio 43055.

Dentronix Adds Unit

SANTA ANA, Calif. — Dentronix Systems, Inc. has introduced a CRT terminal that enhances its Data General Corp. emulation product line.

The 400 emulates the DG Dasher D400, including protocol, keyboard layout and colors. Features include two-page memory, horizontal scroll, vertical soft scroll, 81 or 135 char./line, screen windowing, split screen, 64K-byte random-access memory expansion and passthrough printer port, the vendor said.

Priced at $1,650, the 400 is available from the vendor at 2635 Croddy Way, Santa Ana, Calif. 92704.



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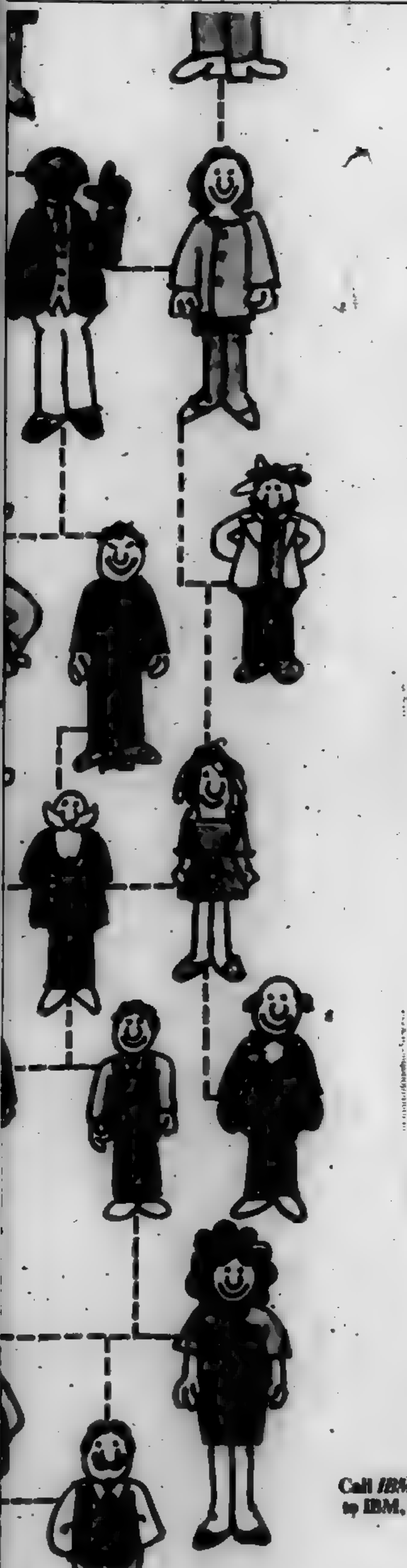

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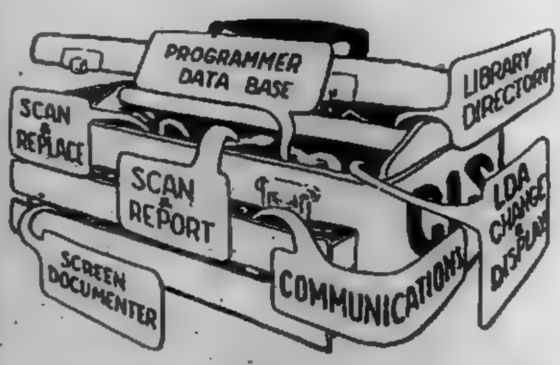

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Protocol Converter Targets IBM System/34, 38 Users

PITTSBURGH, Pa. — Black Box Catalog of Data Communications Devices has introduced a protocol converter that is said to increase the expansion potential of the IBM Systems/34 and /38.

The PQ-4 Protocol Converter Series allows users of the IBM Systems/34 and Systems/38 to twinaxial direct connect RS-232 serial asynchronous Ascii devices to their equipment for bidirectional operation with the PQ-4(B) or receive-only operation with the PQ-4(RO).

The bidirectional PQ-4(B) is available for $2,195, the receive-only model PQ-4(RO) for $1,895. More information is available from Black Box Catalog, Mayview Road at Park Drive, P.O. Box 12800, Pittsburgh, Pa. 15241.

Units Supported For Prime CPUs

WOOD DALE, Ill. — Computronics has introduced software packages that provide support for non-Prime Computer, Inc. terminals connected to Prime systems utilizing the Prime DPTX IBM 3270 emulation software.

The DPTX Driver packages allow the user to communicate with a 3270-compatible host using a variety of commonly available CRT terminals, a vendor spokesman said. The driver works efficiently at 9,600 bit/sec or below and the software allows the user to paint screens quickly, a vendor spokesman said.

The driver for the Lear Siegler, Inc. ADM31 is $1,000, for the Lear Siegler ADM42 $1,200, and the driver for the Televideo, Inc. 950 terminal is $1,700. More information is available from Computronics, 130 N. Ash, Wood Dale, Ill. 60191.

NCR Users Get Security System

MINNEAPOLIS — Century Associates, Inc. has introduced a terminal security system for users of the NCR Corp. B Series and NCR VRX operating system. The software package runs under the NCR financial package, Focis.

The Focis Terminal Security System features a sign-on command with a unique password, limited access to assigned terminals and limited Focis transaction codes, according to a spokesman.

The package will log off users that leave their terminals unattended and will accept sign-ons during banking hours only, a vendor spokesman said.

The package is available for $3,000 from Century Associates, Inc., 1101 W. 80th St., Minneapolis, Minn. 55420.

Quad Board Debuts For PDP-11s, LSI-11s

HUNTSVILLE, Ala. — General Digital Industries, Inc. has introduced a single quad board that was designed to unburden the Digital Equipment Corp. PDP-11 and LSI-11 minicomputers from serial I/O processing.

The Serial Line Controller (SLC) is said to provide high-speed buffered direct multiple access to the host computer memory. It has an on-board Motorola, Inc. 6809 microprocessor and 60K bytes of local random-access memory. Asynchronous, byte synchronous or bit synchronous modes of operation are individually selectable for each of the two serial ports.

The SLC is available for $2,495 from General Digital Industries, 7702 Governors Drive, Huntsville, Ala. 35805.

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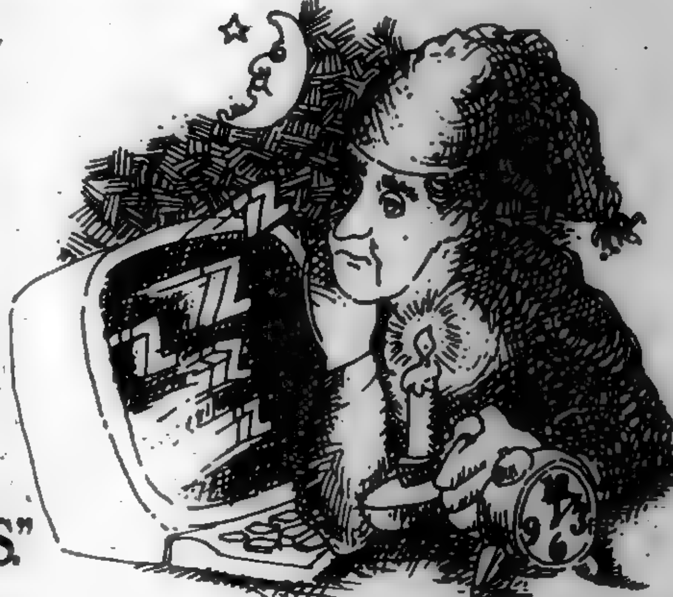

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A True Data Base Environment

How to build information systems that reflect a companywide view of your data resource — and break away from the old file-oriented approach.

BY DAVE ACKLEY

Many of today's methods for applying data base technology were originally created for file-oriented systems and later adapted to data base. However, this adaptation has generally resulted in a misapplication of outdated structural approaches to the conceptually different data base environment. The traditional information systems design process needs changing in three fundamental respects: first, to separate data base design from information systems designs; second, to redefine information systems boundaries; and third, to improve the way information systems development projects are prioritized.

A new approach is necessary to produce systems that take full advantage of data base capabilities. Existing methods fail to support the data base goal of providing shared access to common company data to all users who need it. Adequate techniques are available for designing data bases, but information systems development practices still lag behind.

Only a global information planning structure can make it possible to specify manageable boundaries for information systems development projects. An information systems architecture also provides a tool for preparing an effective migration plan for moving to a true data base environment.

File-oriented systems have been the mainstay of computer applications since the days of punched cards. Data files have been tailored to provide just the data needed by the information systems' application programs, in their unique format. However, with the development of on-line disk storage and its widespread use to make company data more readily accessible, file-oriented systems have gradually become inadequate. As the volume of company data has increased and the need to share that data has accelerated, the rigid data structures of file-oriented systems have become a handicap and a deterrent to new applications development.

Data bases and data base management systems (DBMS) were developed to overcome the handicap of file-oriented systems. Data base technology was intended to serve multiple applications, reducing the need to store data in redundant information systems files. The same data could be accessed by many different information systems for different applications — and even for new applications yet to be defined.

When companies first began to use DBMS, they proceeded cautiously, implementing one data base-oriented information system at a time. This allowed both the users and members of the management information systems (MIS) department to become familiar with the new concepts gradually, without disrupting the whole MIS operation.

> *'The original promises of data base are seldom being fulfilled. Data independence for application programs is not being achieved, and data is still thought of as "belonging to" particular areas of the company; it is not managed as a company resource.'*

However, this seemingly prudent approach resulted in application-oriented data base systems, each of which focused on only one particular area of the company. These systems provided some of the benefits of data base, but lacked the required flexibility for broad sharing of data in other areas of the company and thus failed to overcome one of the most severe limitations of the original file-oriented systems.

As data base technology progressed, the idea of managing data as a company resource, separate from the systems that use the data, became a goal. If data could be organized around company business subjects, instead of being tailored to individual application areas, the resultant structures would be more stable and shareable by everyone. A method was needed to identify these company business subjects, to provide an overall blueprint for data base design. Such a method would have to proceed from a top-level business perspective in order to sort out, from among all of the user requirement details, the major business subjects about which data is needed.

Top-Down Planning

A number of top-down planning techniques have been devised to aid planning teams in developing data bases that are oriented toward the basic company business subjects. One of the earliest was IBM's Business Systems Planning (BSP), developed in 1975. BSP led the way by introducing the concept of companywide data planning, involving company management in the data and information systems planning process, broadcasting the idea of managing

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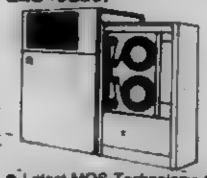

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data as a company resource and introducing a top-down procedural rigor into what used to be an uncoordinated collection of parochial design processes.

Since then, other methods and systematic approaches have appeared, and the idea of building a comprehensive plan for company data has gained widespread acceptance. However, the original promises of data base are seldom being fulfilled. Data independence for application programs is not being achieved, and data is still thought of as "belonging to" particular areas of the company; it is not managed as a company resource.

In general, this lack of success has been due to one of the following:

- The basic concept of managing data as a company resource, separate from the information systems that use it, has not yet been implemented in terms of a delineation of responsibility between the data administration organization and the systems development projects.
- Information systems development projects still tend toward the pre-data-base idea of trying to encompass all sources and uses of "their" data within their analysis. Instead, project leaders should recognize that data bases are to be shared by multiple systems across the entire company to serve the various users who need access to company data.
- Information systems development projects are not being properly prioritized, with regard to source data availability and migration sequence, for transition from existing systems and data files to a subject data base environment. Systems development projects are usually scheduled according to a perceived need for new capabilities (often politically influenced), with little regard for whether the source data to support the systems can be made available.

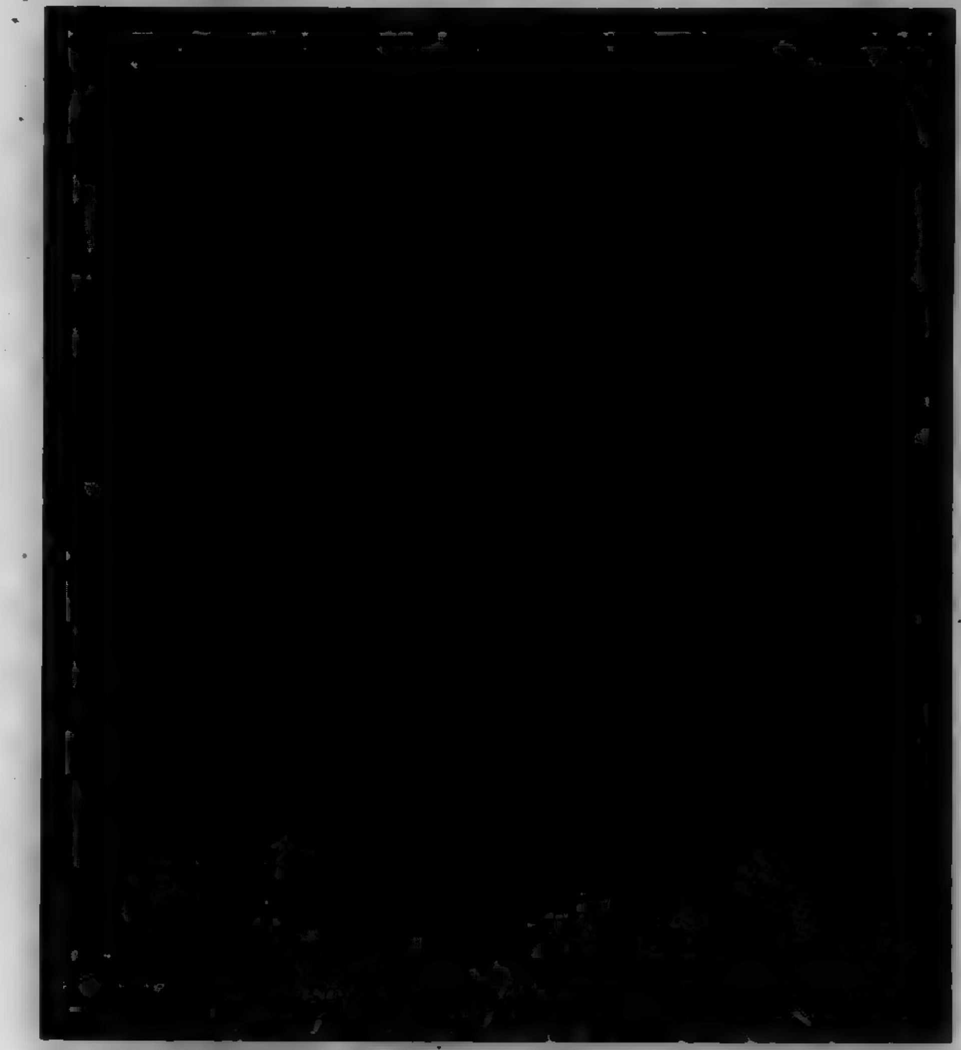
A New Approach

The process of designing information systems for a subject data base environment involves more complex factors than did traditional systems design. In addition to systems analysis and design, there are now sophisticated logical and physical data design methods to be considered, as well as data dictionary standards.

A new information system cannot be planned in isolation: It must be conceived and orchestrated with the plans for other information systems and scheduled in concert with a data base development plan. In scheduling data base and information systems development, the organization must evaluate the adequacy of existing data files and make arrangements for their continued maintenance during the lengthy transition to new data base systems.

Managing data as a company resource requires coordination of all data and information systems development tasks relating to both old and new systems.

In a fully developed data



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base environment, the separation between management of company data and management of the systems that use the data must be clear. The organization and management of company data become the responsibility of data administration. Information systems development is still the responsibility of project development teams, but there is a difference in the way systems data structures are defined.

Each information system development project team performs the detailed systems and data analyses and defines the user views of data that must be made available. In this way, the project team identifies the logical views of company data that are required by a particular information system, without dictating the design of the company-level subject data bases.

Within the framework of subject data bases and their data entities, the data administration organization can then integrate the logical views of data required by this information system project with those of other projects, to create a composite company view of the data. The complete company view of data is thus developed over time and results from the collective synthesis of all user views from all information systems projects as they are designed. It is this company logical view of data that is translated into physical data base design.

The project team concentrates on using and applying company data for the project's particular user information requirements, while the actual design of company data base structures is left to data administration.

The data bases and the information systems are viewed as separate mechanisms. As illustrated in Figure 1, the data bases provide the repository for all the data needed to operate and manage the company, while the information systems provide the delivery vehicles by which the data is captured, accessed, retrieved and transformed into the information needed by users who perform the various company business activities. Company data is managed and maintained apart from information systems, in subject data bases.

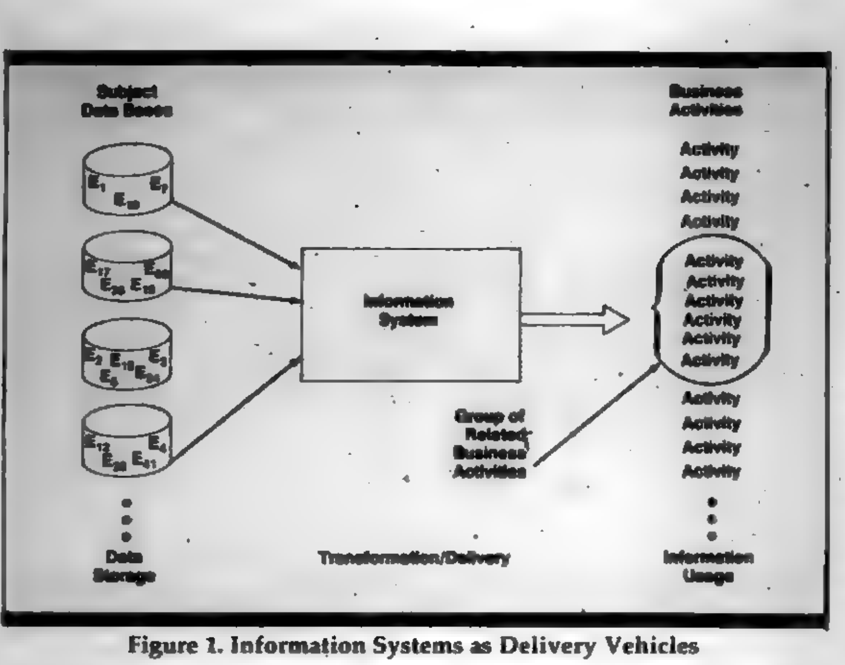

Figure 1. Information Systems as Delivery Vehicles

Outmoded Concepts

Subject data bases in a true data base environment make it unnecessary to think of company data as actually being transferred from business activity to activity, as in traditional file-oriented information systems design methods. Each business activity can now be viewed as accessing the data it needs directly from the subject data bases, instead of receiving it as a transmittal from another activity.

Since the data no longer needs to "flow" from activity to activity (as in "data flow" diagrams), it is no longer necessary for an information systems project team to be directly concerned with where the data originates. The team can concentrate on what information is required within the immediate area of the company being served and how the company data is to be used and applied to provide that information.

In the traditional file-oriented environment, the development project team often found it necessary to include all source data acquisition within their system design. These information systems had names such as "customer data system" or "personnel data system," indicating that everything about that type of data was included in the information system and its files. As a result, the scope of the project usually cut across wider areas of the company than could be effectively managed within a single information system. Projects overlapped, and their teams ran into conflict over who should deal with particular areas of the company.

In a true data base environment, an information systems project team can concentrate on the needs of a specific user area of the company, dealing only with such source data

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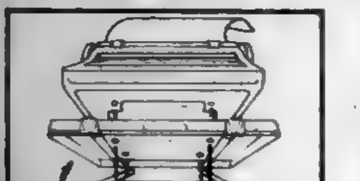

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collection as happens to fall within that particular area. "Customer" or "personnel" might be the names of subject data bases, and many information systems would access those same data bases to serve various groups of users throughout the company.

A project team designing this kind of information system assumes that the data it needs is contained in the subject data bases. It is not this team's responsibility to acquire source data for the subject data bases from other areas of the company: The team need only identify its own required user views of data.

Data Administration

With multiple information systems projects in various stages of planning and development, only a centralized function can provide the necessary coordination of source data planning, and this responsibility falls naturally on data administration. Management of data as a company resource encompasses not only structuring and organizing data bases, but it also encompasses coordinating and planning source data acquisition to maintain the contents of those data bases in a current state.

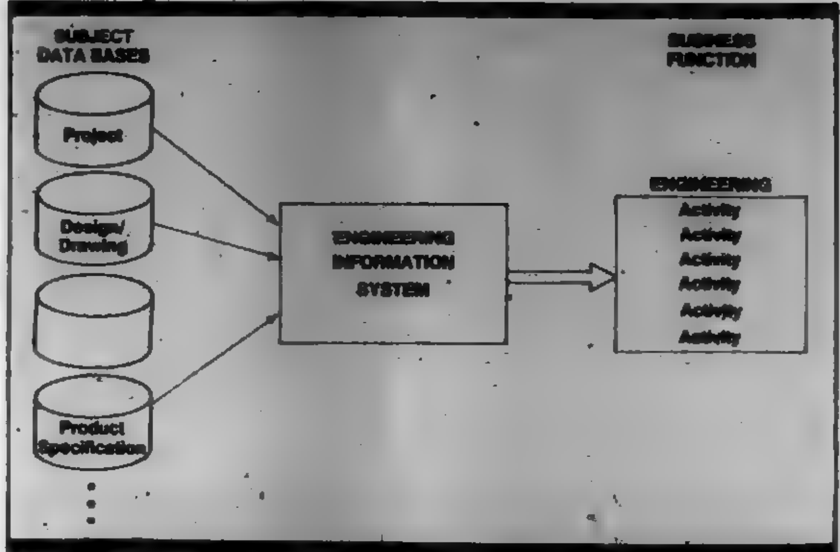

Figure 2. Information System Services Single Business Function

Under this approach, the data administration function is responsible for ensuring that the necessary source data is made available to maintain those data bases that will be accessed by each new information system being developed. Source data availability now becomes a major factor in prioritizing information systems projects, and this implies active participation by data administration in scheduling system projects.

This shift in responsibility is fundamental to the concept of data base, which is to organize and manage company data in such a way that it is available to all who need it. When an information systems project is being designed to serve one group of business activities, but needs data whose source lies in another area of the company, it no longer makes sense for that same project team to determine how the source data will be collected and provided.

Since multiple information systems projects must all share the same company data, they cannot all be responsible for capturing the same source data. Only a separate central function, such as data administration, is in a position to track and schedule all of the company's upcoming source data collection requirements and to coordinate source data availability with project scheduling.

Scope and Boundaries

Building on the basic concept that multiple information systems all share the same company data base structures, a narrower and more effective scope for individual information systems can be specified. There is no longer a need to extend the scope of a particular information system across wide areas of the company, nor to acquire needed source data or to attempt to serve all users who may ever need access to that data. Each information system can be designed to focus on one particular user area without excessive concern about all of the other areas where users may also need to share some of that same data.

An information systems project development team can concentrate on the information requirements of a group of activities within a single business function, such as engineering, manufacturing or sales. Others outside that particular function may be allowed to use the resulting information system, but the system can be designed specifically for the users within that function's group of related business activities, without having to consider all other possible uses of that information in other parts of the company. Each systems development project focuses on activities within a single business function of the company (see Figure 2).

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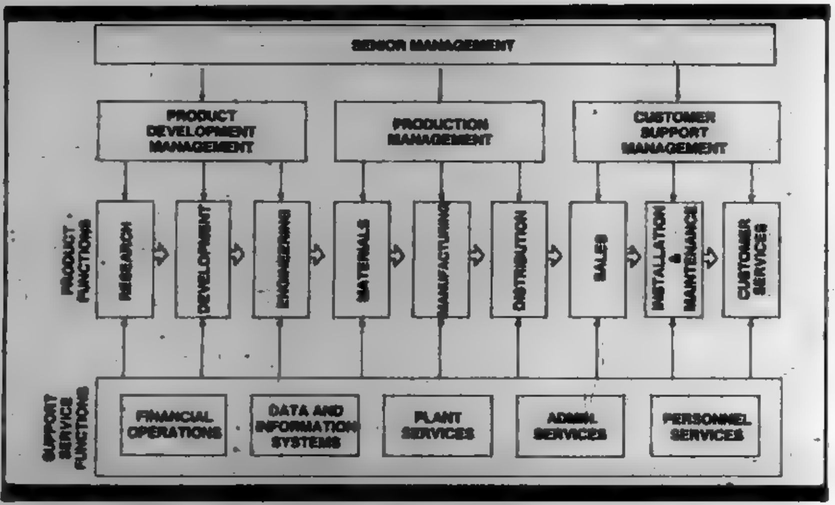


Figure 3. Functional Business Model of Manufacturing Company

company are adequately covered by these more narrowly focused information systems, an overall structural blueprint is needed, showing where each individual system fits into the scheme of things. If the individual systems are relieved of the responsibility for other uses of the data they employ, there must be some other structural mechanism to prevent voids and overlaps in information systems coverage.

Information Systems Architecture

The information systems architecture provides the global delineation of all systems required to operate and manage the company, by defining information systems which:

- Serve a group of closely related business activities that fall within a single business function.
- Communicate only with subject data bases, not with other information systems.
- Have clearly defined system and project boundaries.
- Are manageable as implementation projects and maintainable as operational systems.
- Collectively extract data from the subject data bases and transform it into the information required by all users to perform business activities.
- Collectively capture all of the source data needed to maintain the subject data bases in a current state.

The top-down data planning methods mentioned earlier did not fully incorporate the fundamental premise that subject data bases, not information systems, make common data available and shareable throughout the company. Consequently, their resulting information systems have still tried to encompass too broad an area of the company within their domains. The boundaries of these information systems have been based on which data is being used, rather than on which business activities are being served.

In a true subject data base environment, each information system is tailored to access whatever subject data bases are necessary to serve a group of closely related business activities, that is, a single business function. To develop an appropriate information systems architecture, it is first necessary to identify the basic company business functions. Figure 3 illustrates the business functions for a manufacturing company that services its own products. Each of these functions requires access to its own unique combination of company data, and each function defines a corresponding information system, in terms of scope and boundaries.

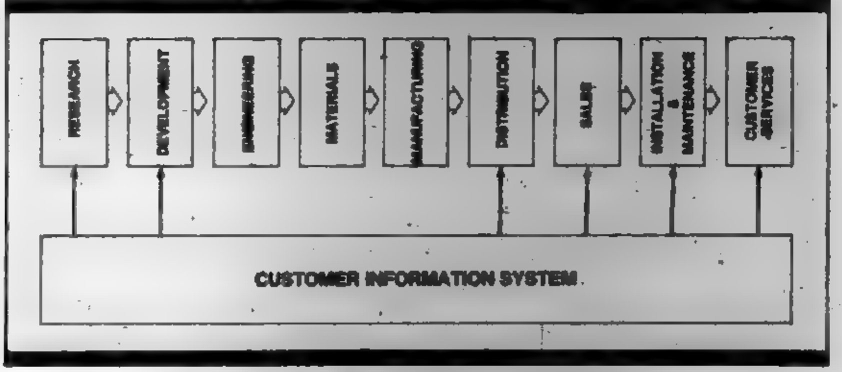
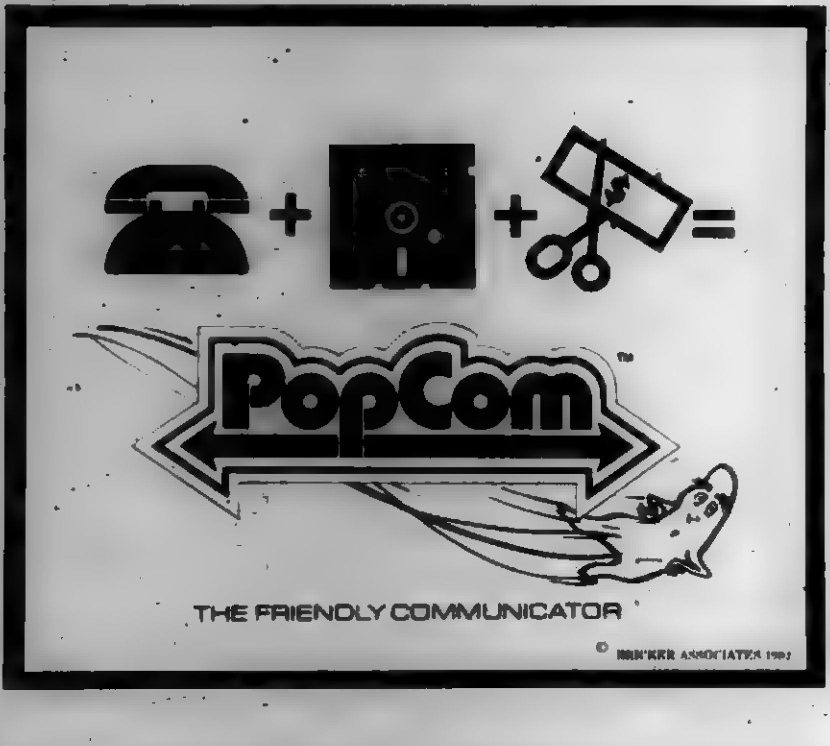


Figure 4. Traditional Information System

Figure 4 applies the same business model to portray a traditional information system, which attempts to cover everything about customer information, its source data collection and all the major uses of customer data. Such a traditional system is very broad, encompassing multiple business functions across very different areas of the company.

Figure 5 examines a portion of the same business in a true data base environment. Here, the information systems each serve a single business function, while a customer data base can be seen to provide the mechanism for sharing customer data among all affected functions. There is no longer a "customer information system" at all, and the individual systems that replace it deal with much more than just customer data. For example, the sales information



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system uses customer data in conjunction with work order and other data, and the installation information system combines customer data with both work order and shipment data.

Once this new understanding about information system purpose and scope is accepted, the information systems architectural design takes on a very different structural theme. Its orientation is no longer toward the type of data being used, but focuses on the information requirements of the groups of business activities being served. It becomes much more closely related to the functional nature of the company and can be directly patterned after a functional model of the business.

Need for Migration Plan

The information systems architecture provides a blueprint for all information systems that eventually must be developed as part of the data base environment. However, this blueprint shows only the overall design structure and says nothing about the sequence for developing systems. Priorities for the systems projects must be established by another mechanism.

If a company were starting from scratch, with no systems at all, its systems development project priorities would not be affected by the adequacy or inadequacy of existing systems. However, a company large enough to contemplate top-down data planning is not starting from scratch. It has long since developed efficient systems upon which its day-to-day operations depend and could not instantly develop replacements. Given the complexity of company operations and the availability of systems development resources, only a gradual migration from existing systems to the new systems architecture is feasible.

To prepare for the transition from traditional file-oriented information systems and application-oriented data bases to a company-oriented subject data base environment, a company must first develop a comprehensive migration plan. Such a plan involves maintaining existing systems and data files, while gradually developing the new company-oriented subject data bases and information systems in a parallel environment.

A key factor in determining a workable migration sequence from old to new systems is the availability of source data for the subject data bases, which will be accessed by each new information system as it is developed and becomes operational.

Source Data Requirements

The information systems architecture specifies the overall boundaries of each information system in terms of the business activities served. The top-down planning method that develops the information systems architecture also identifies which data entities in the subject data bases will be accessed by each of the resulting information systems. This high-level data requirements definition is sufficient for determining the type of data required by each system in terms of the subject data bases and their entities. It then provides a basis for identifying where in the company that data is now being, or should be, collected.

Each new information system will require the availability of current data about particular data entities, which is stored and maintained in subject data bases. A key factor in planning for a new information system is deciding where and when the source data will be obtained.

For a given information system, it is unlikely that more than a small percentage of the data it uses will be collected within the same activities it serves. If the system does not collect its own data, some other system will have to acquire it.

Before a decision can be made to proceed with developing a new information system, there must be an analysis to identify the business function or functions where the data to be used originates. A further analysis is needed to determine whether a system to collect that data already exists or will have been implemented by the time the system in question is ready for operation.

This requires careful planning from the start, before any new systems are developed. Recognition of this dependency on the availability of source data introduces a new requirement into the project prioritization and planning stage, during which care must be taken to determine when and how the required source data for each new system will be obtained.

Until a large portion of the new information systems have been developed, much of the source data required by the new subject data bases will most cost-effectively be obtained from existing data files, even

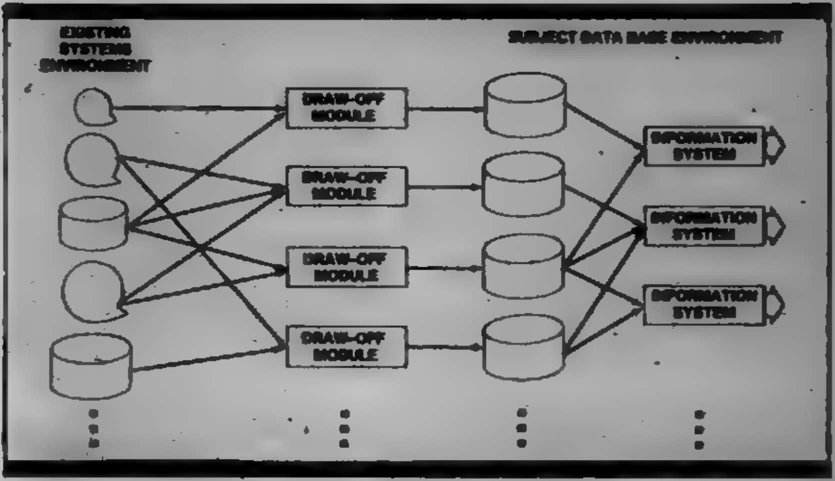

Figure 6. Parallel Environments

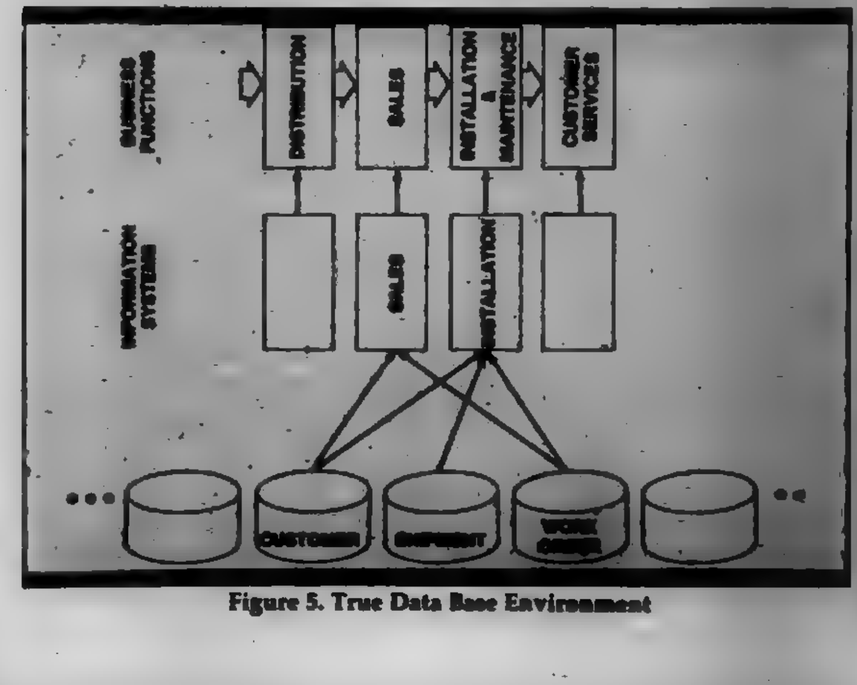

Figure 5. True Data Base Environment

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though their data structures will seldom be in the required format.

As a way of getting started, it will usually be feasible to draw a major part of the needed data from existing data files, to be reformatted into the new subject data bases by means of special program modules that perform the necessary file draw-offs and data restructuring. Figure 6 (on Page 59) illustrates this draw-off of data from the old to the new environment. In time, as additional information systems are developed in the areas of the company where the source data originates, the draw-off programs can be replaced by more effective and complete source data collection routines.

For some of the new information systems, certain required data may simply not be available, either from within the existing data files or from among the new information systems projects under development. In this situation, a special data collection module may have to be designed. Depending on the timing and scheduling for developing a new information system for the business function where the source data must be collected, the data collection module may become integrated into another information systems project or may have to be designed as a temporary stand-alone module.

Eventually, when the local information systems for those groups of business activities are developed, such temporary modules will be replaced. Temporary data collection modules keep the new information systems boundaries clean, since these modules use entirely separate designs that do not compromise the structure of the new information systems.

It is likely that some "throwaway" data collection modules will have to be developed to facilitate an effective transition to the new data base environment, just as temporary draw-off modules will be developed to bring data across from the old environment.

Status of Existing Systems

The first step in planning the migration to a true subject data base environment is to determine how each of the existing information systems relates to the new information systems architecture.

1. How do the boundaries of the existing system compare with those of the information systems architecture?

2. In terms of data usage, which areas of the information systems architecture correspond to the areas served by the existing system, and how adequate is the existing system in meeting those user information requirements?

3. In terms of source data collection, which areas of the information systems architecture correspond to the places where data is captured by the existing system, and how adequately do the existing systems capture source data from that area of the company?

The detailed procedure for carrying out this mapping process involves decomposing each existing information system into modules, such that the mapping of a given module into the information systems architecture has minimal overlap across the architectural boundaries.

This reduces the scope of the existing system and creates units that more closely align with the company business functions. An existing system might break down into several modules, each of which could map into a different area of the information systems architecture.

There will be major differences between the boundaries of the information systems architecture and the boundaries of the existing systems. Existing systems will probably extend across wide areas of the company, while the new information systems each focus on the information requirements of a single function of the company. Because of these differences, the mapping process will often separate an existing system's source data collection from its main usage.

In a true data base environment, there is no longer a need to combine source data collection and usage under the same information system design. This analytical decomposition of existing systems makes it possible to compare what exists today with

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the new information systems architecture.

When the existing information systems have been decomposed into modules and mapped into the information systems architecture, a migration plan can be prepared. This plan will be based on a comprehensive picture of existing systems' adequacy, new information requirements and the realities of source data availability.

By working with the modules of existing systems instead of entire systems as indivisible units, a company can compare the old information system's capabilities and structure with those of the new system. The practicalities of continuing to collect source data via existing systems can be traded off against the cost of developing new data collection modules and the urgency of meeting new user information requirements.

> ***'Augmented by source data collection analyses, the information systems architecture provides a comprehensive planning aid for comparing the cost and feasibility of developing the new information systems, depending on which systems are developed first.'***

Planning Aid

Augmented by source data collection analyses, the information systems architecture provides a comprehensive planning aid for comparing the cost and feasibility of developing the new information systems, depending on which systems are developed first.

It facilitates a value, cost and feasibility comparison of alternative information systems development priority sequences, considering both the perceived need for new information and the practicalities of various sequences of development.

With the information systems architecture as a common framework for relating existing capabilities and source data availability to new information systems requirements, a practical schedule can be prepared for migrating to a true data base environment.

This schedule, together with the information systems architecture, provides a vehicle for technical analysis and management decisions on both the urgency of each new system and the timing and feasibility of its development.

In Summary

A top-down planning approach is needed to develop information systems that are designed for a true data base environment. By working from the perspective of the company as a functional business enterprise, a stable architectural design for company information systems can be prepared.

This information systems architecture becomes a common frame of reference for comparing the status of existing systems capabilities with new information requirements.

It provides a comprehensive planning device to account for the availability of source data to support the new subject data bases, as well as a tool for defining a practical information system project development schedule.

About the Author

Dave Ackley is a senior consultant with Holland Systems Corp., Ann Arbor, Mich., which specializes in methods and software for comprehensive planning of company data, information systems and computer technology.

He has more than 20 years' experience in the computer field, with current emphasis on data resource management and office automation.

He holds a B.S. in electrical engineering from Stanford University. His Ph.D. and MBA were completed at California Western University, with specialization on data base long-range planning and cost/benefit analysis.

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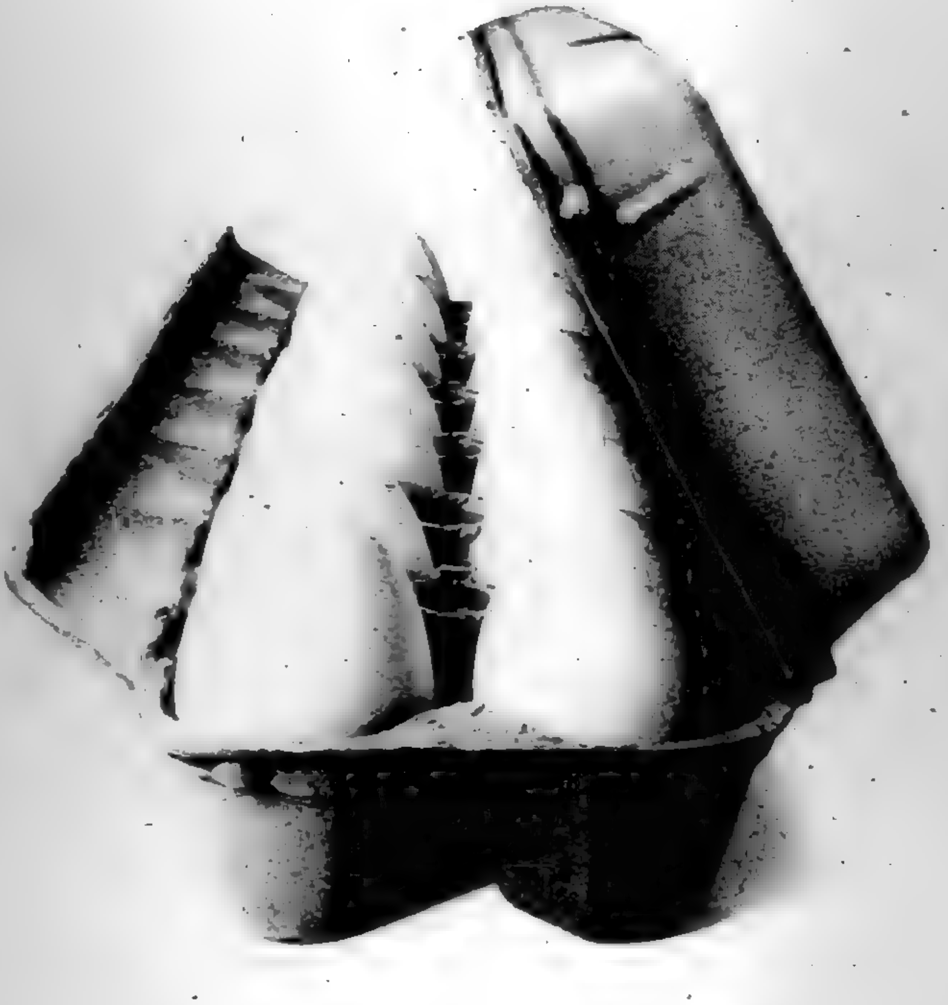

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Compatible With IBM CPUs

Intel Develops Disk Memory System

SANTA CLARA, Calif. — Intel Corp. has developed an IBM-compatible semiconductor disk memory system that reportedly reduces on-line terminal response time in high-volume operations by 50%.

Compatible with IBM's 370 series, 30 series, 3080 series and 4300 systems, the Fast-3825 disk memory system can access and transfer data at up to 4M byte/sec and handles paging in an average MVS paging environment up to five times faster than IBM's 3880 Model II disk system, the company claimed.

While it is half the size of its predecessor, the 3805, the Fast-3825 has more memory with capacities ranging from 12M bytes to 144M bytes. The system can diagnose and correct double-bit errors, move stored data from defective memory areas to spares for "self-healing" and record errors for later analysis, according to a spokesman.

The new disk memory system is compatible with several operating systems. Using a fixed-block architecture, the Fast-3825 operates more efficiently than the 3805, under the VM/370 as well as DOS/VSE and Burroughs Corp. formats, the company claimed. Software support for all IBM operating systems that support the IBM 2305 fixed-head storage facility is distributed automatically, a spokesman said.

Despite the recent decisions by Storage Technology Corp. and Control Data Corp. to discontinue production of disk drives using fixed-block architectures because of poor user acceptance, Intel spokesman Steve Page feels Fast-3825 can carve out a niche in the marketplace. "We decided to go with a fixed-block architecture because it was one way of getting the user more usable megabytes out of a box that had those megabytes resident. It provides the most bytes per dollar," he explained.

Options available on the system include a data-streaming feature capable of transferring data at 3M byte/sec, a 2-byte width transfer, two-channel switch and additional storage increments of up to 144M bytes.

The Fast-3825 ranges in price from $120,000 for the basic 12M-byte configuration to $815,000 for the fully featured model. More information is available from the vendor's Literature Department, K-5, 3065 Bowers Ave., Santa Clara, Calif. 95051.

Apollo Introduces 32-Bit Micro To Compete With VAX-11/780

BOSTON — Apollo Computer, Inc. unveiled here recently an under-$11,000, 32-bit virtual memory microcomputer for scientific applications that the company said will compete with Digital Equipment Corp.'s VAX-11/750 and -11/780.

Billed as a "desktop mainframe," the DN 300 is a 68010-based system intended primarily for applications involving computer-aided design/computer-aided manufacturing (CAD/CAM), design analysis and computer-aided software engineering, according to a spokesman for the vendor. First shipments of the system are expected to be made in early March.

Besides the DN 300, other introductions included:

- DSP80 Server Processor, an intelligent peripheral and communications server that improves the DN 300's performance by off-loading peripherals and communications tasks.
- Domain X.25, a communications subsystem that enables the DN 300 users to communicate remotely over the vendor's Domain network.

Apollo's DN 300 Desktop

The DN 300's basic configuration consists of the 68010 chip, which contains 512K bytes of main memory, a 17-in. black and white, high-resolution monitor capable of displaying bit-mapped graphics, a detachable keyboard with 32 function keys, an interface to the vendor's 12M bit/sec local-area network, two RS-232C serial I/O ports and the Aegis operating system.

Options for the system include main memory expansion up to 1.5M bytes using 64K random-access memory (RAM) chips, a 34M-byte Winchester disk drive and a touchpad cursor control. Optional software includes the full Ansi standard Fortran 77, Pascal, and C languages, the complete Siggraph Core graphics library and AUX, a Unix System III-based operating system.

"Just as the goal of office automation vendors is to put a computer terminal on every office worker's desk, our goal is to enable every technical professional to have a desktop mainframe," asserted John Poduska, Apollo president. He added that in concert, the DN 300, DSP80 Server Pro-

(Continued on Page 66)

IBM 4300 Software-Compatible

Cambex Adds CPUs to 1600 Line

WALTHAM, Mass. — Cambex Corp. has added two IBM 4300 software-compatible processors to its 1600 computer series.

The vendor claimed the two processors have twice as much memory capacity as comparable IBM 4300 machines.

Both Cambex processors feature a microprogrammed, bus-driven architecture that allows the CPU, main memory or I/O channels to be field-upgraded through printed circuit board changes, the company noted.

Explaining the advantages of a microprogrammable architecture, marketing vice-president Gene Larkin said, "Users can load the microcode through a special assembly language into a separate memory. With this capability, you can run the instructions in the microcode much faster than you could in main memory." Both units have a microcode control storage that supports up to 144K bytes.

Both 1600 processors use emitter-coupled-logic hardware circuits with a 50-nsec cycle speed. The units' standard I/O channels include a byte multiplexer and up to four and five block multiplexer channels for the 1636-10 and 1641-11 processors, respectively.

Memories of both units use error-correction techniques to correct automatically all single-bit errors and detect double-bit errors. The units both contain redundant arithmetic logic units for comparing results of all functions, a spokesman said.

The 1636-10 and 1641-11 are completely software-compatible with the IBM 370 and 4300 series when running under the DOS/VS, OS/VSI, MVS, VM-370, DOS/VSE, MVS-SP and VM-SP operating systems, as well as with all application programs written for the 360, 370 and 4300 systems.

According to Larkin, Cambex will depend largely on "value-added resellers, distributors and OEMs" to market the CPUs, rather than on its direct sales force.

(Continued on Page 68)

Tycom Offers 8088-Based System

Tycom Corp.'s Microframe

LONDON — Heralding it as the first fourth-generation computer, Tycom Corp. has introduced an Intel Corp. 8088-based multiuser system here that has a performance range extending from a mid-range microcomputer to a high-end minicomputer.

Described by some observers of the London computer scene as "future proof," Microframe contains a vendor-developed bus architecture called Versatile Base Bus Connect (VBC) that enables its chassis, which is available in 6-, 12- and 22-slot versions, to accommodate Zilog, Inc. Z80, Motorola, Inc. 68000 and Digital Equipment Corp. PDP-11/70 board-level upgrades.

The 16-bit system, which can support up to 30 users simultaneously, will be available in the UK early this month, but will not be available on the U.S. market until the middle of the year. The company plans to open up its first U.S. office in San Francisco sometime this month.

"Previous generations of mainframe, mini- and microcomputers were in very clear price/performance brackets, and they tended to be manufacturer-specific in terms of the operating systems they would

(Continued on Page 68)

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Lack of User Acceptance Cited

STC Axes 8370 Drive Production

LOUISVILLE, Colo. — Storage Technology Corp. (STC) announced it has stopped production of its 571M-byte 8370 disk drive because of lack of user acceptance. The company said it plans to reassign the 8370's production and engineering resources to meet the demand for its 2.5G-byte 8380 drive, which is expected to reach the market in March.

The major reason there has been little demand for the 8370, according to the vendor, is its fixed block architecture. While this architecture is generally considered to be superior to count key data technology, users have had difficulty integrating it into their distributed data processing networks.

A spokesman for STC believes the market is just not adapting to the fixed block architecture because generally the architecture of data storage is count key data. The problem, he said, is that count key data is very well established in the marketplace, and fixed block architecture was introduced only three years ago when IBM put it on its 4331. The major difficulty in integrating a disk drive using fixed block architecture into a distributed network is migrating files, he continued.

Basically, if you have a computer system that is doing all its data storage based on count key data, but you have one site using fixed block architecture, you aren't compatible even though you might be running all IBM equipment and running under DOS or VM operating systems. But, if you have 10 distributed sites, each with a 4300, and just one of them has a fixed block architecture, you would have to work around that system in everything you did, he explained.

While the spokesman admitted that fixed block architecture is superior to count key data, he said he does not expect the 8370 to make a comeback. However, the effort and money put into development and marketing of the 8370 has not been a total loss. Much of the 8370's technology is transferable to the 8380, he noted.

The list price of the 8380 is expected to range from $70,000 to $100,000, the vendor said from 2270 S. 88th St., Louisville, Colo. 80027.

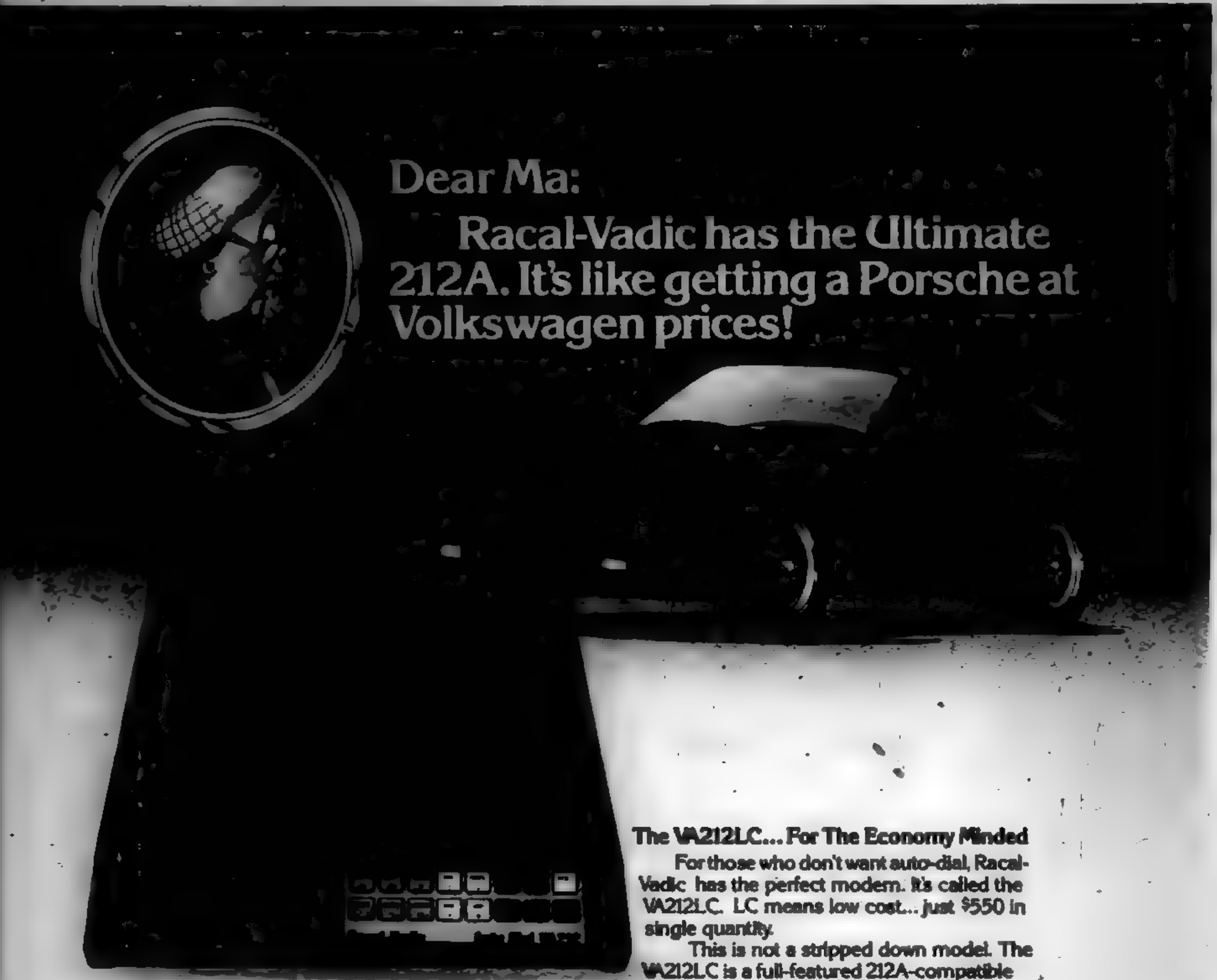
Printer Gets Price Cut Of 42.5%

BOSTON — Data Impact Products, Inc. has announced a price reduction on its D-92 dual-mode dot matrix printer from $695 to $399.

The 42.5% price cut was achieved "through further design simplification and manufacturing efficiency," according to the vendor. The dual-mode operation of the printer is said to provide higher speed printing using a 7 by 9 dot matrix font, as well as an 11 by 9 dot matrix font for "near letter quality" documents.

The printer features 100 char./sec bidirectional printing, short-line-seeking logic, friction paper feed, parallel interface, 800-char. buffer and full-character Ascii set.

The firm is located at 745 Atlantic Ave., Boston, Mass. 02111.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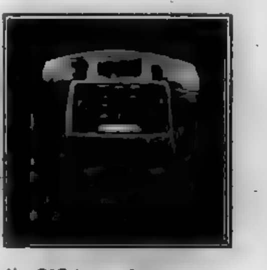

The VA212LC's extensive diagnostics include remote digital loopback and self test. Remote loopback allows end-to-end testing over the telephone from any of Racal-Vadic's regional diagnostic centers. The carrier indicator shows when you've established connection.

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Apollo Micro Released for Science Applications

(Continued from Page 63)

cessor and Domain X.25 "could very well eliminate time-sharing in computer-aided design/computer-aided manufacturing (CAD/CAM) applications."

Poduska said the system, which supports up to 15 concurrent user processes, is ideally suited for large organizations such as General Motors Corp. that "like to buy their hardware on the outside and have their own programmers write the software."

While it is described as a desktop mainframe, Poduska admitted the DN 300 is not comparable to a mainframe in terms of performance, but is similar to a mainframe in that it can process large software programs.

A spokesman noted the system will run application programs that allow engineers to design such things as airplane wings, automobile bodies and printed circuit boards.

When asked to compare the technology and market positioning of the DN 300 with Hewlett-Packard Co.'s recently introduced HP 9000, Poduska sidestepped the question saying he would prefer not to assume what HP's marketing plans were.

Asked the same question, marketing director Ed Zander said HP's proprietary 32-bit reportedly "is faster" than the Apollo processor, but added his company's system is priced one-third to one-half lower than the HP 9000.

Apollo attributes the DN 300's price/performance capabilities to configuring the CPU and 512K bytes of main memory on a single circuit in addition to modular, compact packaging. According to the spokesman, all the CPU, disk control and network interface electronics are contained within the display's enclosure.

The DSP80 Server Processor has its own 32-bit processor, a five-slot Multibus card cage and up to 1.5M bytes of main memory. With the five IEEE-796 card slots and two RS-232C serial ports, the processor can support a range of peripherals including large-capacity disk drives, gateway communications to external networks, line printers and letter-quality printers, according to the company.

The 2M byte/sec processor has an optional software package called General Purpose I/O that enables users to write device control programs in higher level languages.

Single prices for the unit start at $7,000.

The X.25 communications gateway permits Apollo system users to communicate with remote systems as well as with its own Domain network. The new interface adheres to the CCITT communications protocol standards and the ISO Open Systems Interconnection reference model, the company said.

"More and more, large companies are using public data networks to link geographically dispersed engineering groups with distant host computers both in the U.S. and abroad. To do this, they require support for X.25 and related international standard protocols," asserted Jeff Wilson, marketing manager for the communications package.

The X.25 Gateway lists for $15,600.

More information about the products can be obtained by contacting Apollo Computer, Inc., 15 Elizabeth Drive, Chelmsford, Mass. 01824.

Drum Plotter/Printer Added to Plotter Line

COSTA MESA, Calif. — Watanabe Instruments Corp. has announced the addition of a drum plotter/printer to its line of intelligent plotters.

The WX 4731 is a desktop plotter featuring graphics and print modes. It offers four pens, an RS-232C interface and various options including two for plotting area sizes.

It costs $2,490 from 3186-D Airway Ave., Costa Mesa, Calif. 92626.

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Molecular Supermicro Line Extended With 32X, 64X

SAN JOSE, Calif. — Molecular Computer, Inc. has extended its supermicrocomputer line with the addition of two second-generation systems that reportedly provide greater disk capacity and processing speed than the company's existing multiuser products.

The introduction of the firm's X-series supermicros came recently during Digital Research, Inc.'s first CP/M Exposition. It was here that Molecular also announced a 25% price cut for its older Supermicro 8 system and a 30% reduction for its application processors.

Molecular's X-series consists of two models — the Supermicro 32X, an enhanced version of the company's existing Supermicro 32, and the Supermicro 64X, which extends the performance of the firm's older Supermicro 64.

Increased Capacity

Both the Supermicro 32X and 64X provide twice the disk capacity and bus transfer speed and four times the file-processor memory of their first-generation Molecular counterparts, a company spokesman said.

The X-series machines also reportedly boast a 6-MHz file processor, which runs 50% faster than its Supermicro 32 and 64 predecessor.

A minimum 32X and 64X configuration supports a 60M-byte and 136M-byte disk unit, respectively, compared with 30M bytes for the Supermicro 32 and 60M bytes for the Supermicro 64, according to the spokesman.

The second-generation machines also hold 256K bytes of file-processor memory and transfer 400K byte/sec over their system buses, compared with 64K bytes and 200K byte/sec for the Supermicro 32 and 64, the source added.

Related Moves

In related moves, Molecular cut the price of its eight-user Supermicro 8 system from $7,995 to $5,995 as well as the price of its application processors from $995 to $695.

Both the Supermicro 32X and 64X come with a Zilog, Inc. Z80B-based file processor and one or more 4-MHz Zilog Z80A-based application processors, each with 64K bytes of random-access memory (RAM).

One application processor board is dedicated to each X-series system user, according to the vendor.

Performance Option

As an option, users can also specify their X-series configurations to incorporate one or more "performance accelerator" boards, which hold an 8-MHz Intel Corp. 8086 microprocessor and 256K bytes of RAM expandable to 1M byte.

The presence of a performance accelerator in the 32X and 64X adds a 16-bit processing capability to the machines' eight-bit Z80A and Z80B, according to the vendor.

Up to four performance accelerators can be added to the 32X systems and eight to the 64X, the spokesman said.

Like their first-generation counterparts, the X-series systems support up to 32 and 64 concurrent users, will be sold both to distributors and to high-volume end users and will run CP/M and CP/M-86, the source added.

A Supermicro 32X with a 60M-byte Winchester disk system, 500K-byte floppy diskette module and 32 application processor slots costs $18,995, compared with $22,995 for a similarly configured Supermicro 64X with a 136M-byte Winchester disk unit.

Shipments of the X-series machines will begin during the second quarter, according to Molecular.

The firm is located at 251 River Oaks Pkwy., San Jose, Calif. 95134.

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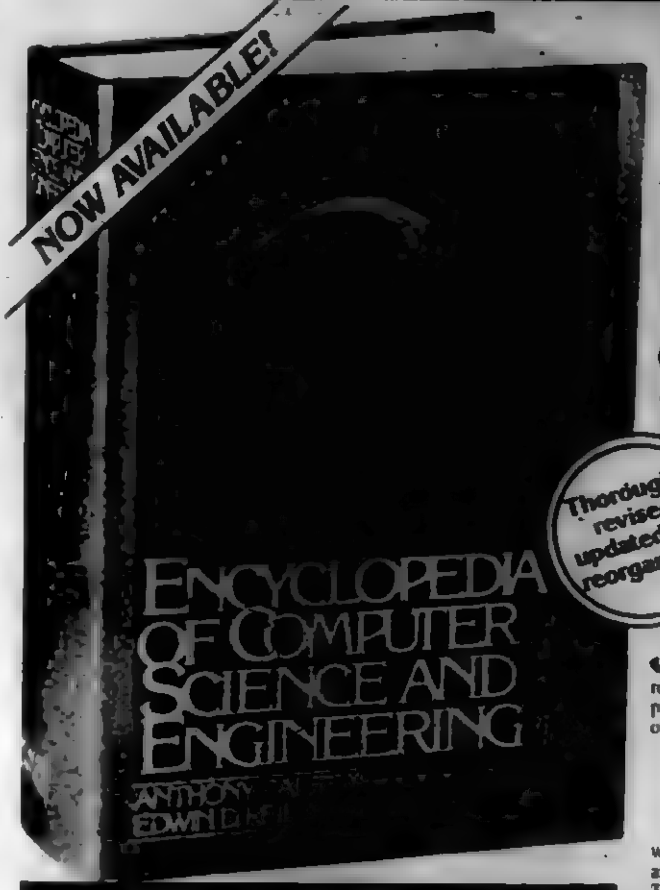

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Tycom Claims a 'First' in Fourth-Generation

(Continued from Page 63)

run. But with Microframe, you have a massive performance span that runs within a single box," marketing manager Peter Williams said, explaining why he feels the system is a fourth-generation machine.

The initial release of the system will run under Microsoft, Inc.'s Xenix operating system, as well as Digital Research, Inc.'s CP/M and CP/M-86 operating systems. Within the next two months, according to a spokesman, MS-DOS Version 2.0 will also be available. In terms of hardware upgrades, the company expects to have a 68000-based board available by the end of March. Pricing on the 68000-based board has not yet been determined, the spokesman said.

Williams noted that historically, most bus designs have been based on a "star-type architecture" containing either one or two processors that feed the peripherals. The VBC architecture, however, has one bus wire "going down the middle, with a number of wires crossing the bus giving its slots a rectangular shape," Williams explained. He claimed that this design offers a greater degree of precision than the S-100 and Intel Multibus architectures.

"What you have got [with Microframe] is a highly specified personal computer with empty slots that can run any other system. You can cease worrying what is going to happen next year or the year after that because whatever happens you can put in the appropriate processor or operating system to take advantage of the changing technologies."

Williams said the system's bus, which communicates at 9M bit/sec, can accommodate a powerful upgrade such as the 68000 and PDP-11/70 because of an additional 100M bit/sec bus that runs down the back of the system. Williams contended that most second-generation computers cannot handle the superior processing power of a board-level 68000.

Another advantage the system's bus architecture offers is its ability to provide up to 100 dumb CRTs with bit-mapped color graphics. The bus' speed and ability to draw off the bus controller's memory make such multiple use possible, Williams said.

Priced at approximately $4,600, the basic configuration is made up of an 8-MHz version of the 8088 chip, two 600M-byte floppy disk drives, 128K-byte random-access memory, expandable to 768K bytes, CRT, keyboard, bus controller and the CP/M or CP/M-86 operating system.

Williams said Tycom plans to be "very aggressive" in its marketing of Microframe in the U.S., saying his firm is now talking with "several major distributors." The company will also be selling the system in Japan, France and Germany.

Further information is available from the vender at 8-12 New Bridge St., London, England EC4V 6AL.

Portable Cleaning System Out

SUFFERN, N.Y. — A portable cleaning system especially designed for computer maintenance has been introduced here by the Metropolitan Vacuum Cleaner Co.

The Metro Data-Vac will air-sweep paper particles from printers and rid disk drives of dust that can shut computers down, the vendor said. Its suction attachments can fit into all hard-to-reach places and remove even microscopic dirt.

This product costs $55. Further details can be obtained from the vendor at 1 Ramapo Ave., P.O. Box 149, Suffern, N.Y. 10901.

Cambex Adds To 1600 Series

(Continued from Page 63)

"To get the most mileage out of the reps we have, we should be going after situations where the potential for multiple [sales] is greater. Everyone heretofore has thought that the OEM has to have a mini. But as they [OEMs] mature, they may find they would like to get into the IBM marketplace with a 32-bit machine," Larkin said.

The 1636-10, with 1M byte of memory, costs $98,500, compared with $150,000 for a basic IBM 4341 K10 processor. A 2M-byte 1641-11 processor lists for $470,000, compared with $240,000 for an IBM 4341-11 CPU. Cambex is located at 360 Second Ave., Waltham, Mass. 02154.

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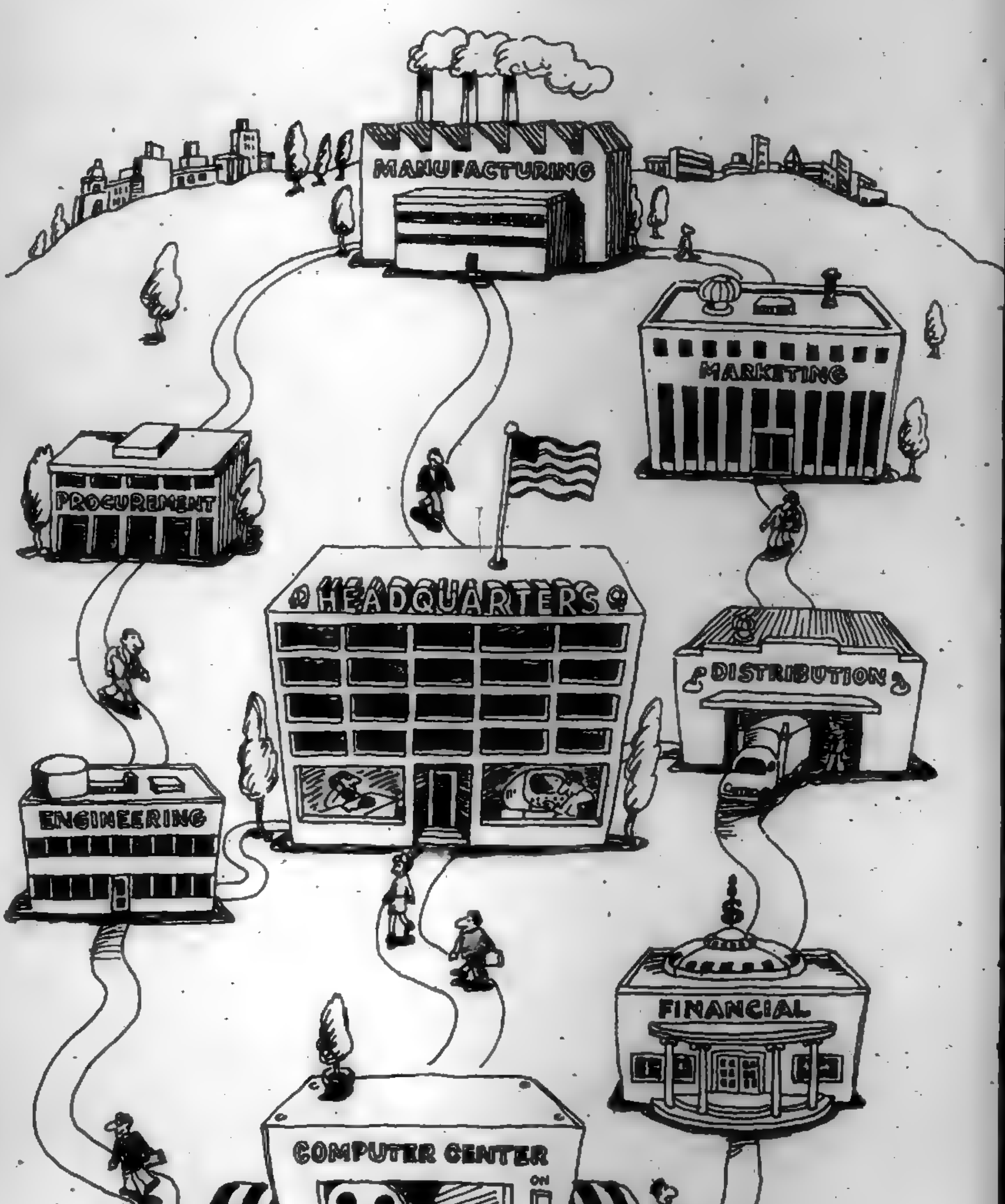

Improved Manufacturing Abilities Cited

Prime Slashes Prices of 550-II-2MC Superminis

NATICK, Mass. — Citing improved manufacturing capabilities and the incorporation of less expensive technologies as the motivating factors, Prime Computer, Inc. has slashed prices on its packaged 550-II-2MC line of supermini computers from 22% to 27%.

The company also announced price cuts on its 750 series as well as on maintenance services for various peripherals.

The new 550-II package now costs $216,480, down from the original price of $268,880. The company has also lowered the price of its Model 750 to $423,600, down from $446,600. Maintenance costs for the 550-II have dropped from $2,490 to $2,281 while Model 750 service charges have dropped from $4,399 to $3,954.

Prime also announced that customer services previously available only for its 2250 system are now available for the company's entire line of 32-bit minicomputers. Those services include the Prime Preferred Service, which offers guaranteed on-site response from 7 a.m. to 7 p.m., and Basic Service, which provides next-day, on-site response from 8 a.m. to 5 p.m., Monday through Friday.

These two services became effective for all new systems on January 18 and will become effective on April 1 for all existing systems.

Monthly maintenance prices for add-on 64K-byte chip memory boards have been reduced by 66%, according to the firm. Maintenance prices on fixed media disks, high-speed magnetic tapes and computer-aided design and manufacturing workstations have been dropped from 19% to 52% while monthly maintenance costs on printers, terminals, communications controllers and software were cut between 10% and 15%.

All price reductions are effective immediately. More information can be obtained from the vendor at Prime Park, Natick, Mass. 01760.

Access' Portable Micro Designed For Zilog's Z80A Microprocessor

SAN JOSE, Calif. — Access Matrix Corp. has announced Access, a portable microcomputer based around the Zilog, Inc. Z80A microprocessor.

Designed for business, education, professional and home use, the system includes a 7-in. monitor, two double-density 5¼-in. disk drives, a detachable keyboard and 64K bytes of main memory. The vendor claims that the system is the first to incorporate all peripherals into a single unit.

In addition, the unit incorporates a high-speed dot matrix printer, a direct-connect modular telephone jack and an internal modem which can operate at up to 300 bit/sec, the vendor said.

The built-in printer delivers hard copy at 80 char./sec and users can print up to 132 char./line on standard-sized paper. In addition to a standard 96-char. Ascii set, the unit is also said to offer graphics capabilities.

The Access portable computer costs $2,495, and comes with Digital Research, Inc.'s CP/M 2.2 operating system and a specialized software package including word processing, spelling correction, data base management and spreadsheet applications. The vendor is located at 2159 Bering Drive, San Jose, Calif. 95131.

Front-End CPU Fits Xerox's Ethernet

SAN JOSE, Calif. — Exelan Co. has announced a board-level front-end processor which is compatible with Xerox Corp.'s Ethernet local-area network.

Called the Exos/101, the front-end processor is aimed mainly at OEMs and systems integrators. The unit is based on an Intel Corp. 8088 microprocessor and comes with firmware and up to 128K bytes of random-access memory. The unit fully implements Ethernet Version 1.0 and is compatible with Version 2.0.

The Exos/101 costs $810 in quantities of 500, the vendor said from 2180 Fortune Drive, San Jose, Calif. 95131.

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OSM Unveils Low-End Zeus, Aimed at Multiuser Market

SANTA CLARA, Calif. — OSM Computer Corp. has announced a low-end version of its Zeus microcomputer.

Called the Zeus4, the unit is aimed at the low-end multiuser market. The system is based on Zilog, Inc.'s Z80 microprocessor and uses OSM's Muse operating system to support up to four users in a segregated operating environment that is compatible with Digital Research, Inc.'s CP/M operating system.

Each user of the Zeus4 controls a dedicated Z80A microprocessor, 64K bytes of main memory and two RS-232C I/O ports. A master Z80A processor module controls the shared resources of floppy and hard disk storage and a floppy disk controller, the vendor said.

The Zeus4 can connect up to four dedicated processors and one master processor through a high-speed parallel, bidirectional, asynchronous interprocessor data channel that is capable of moving data at 200K byte/sec. the vendor said.

A basic processor configuration with 64K bytes of random-access memory, 6.3M bytes of disk storage and 250K bytes of floppy disk storage costs $4,595, the vendor said.

OSM Computer Corp. is located at 2364 Walsh Ave., Santa Clara, Calif. 95051.

EIT Unwraps Two Turnkeys

SOUTH HACKENSACK, N.J. — Electronic Information Technology, Inc. (EIT) has announced two turnkeys, the EIT 6400 and the EIT 4400, for small to medium-size installations.

The 6400 reportedly consists of a Data General Corp. Eclipse computer with 256K bytes of memory, two 16M-byte Winchester drives, eight RS-232C ports and two electronic-imaging terminals with full graphics capabilities. The 4400 system offers the same configuration, except its terminals do not have the graphics options. Both systems can be built up to 16 terminals, the vendor said.

The software package provided with the 6400 and 4400 includes multilevel directory search, background and interactive processing, code conversion and multistring and interactive search and replace.

The 6400 costs $72,000 and the 4400 costs $59,500 from 96 Vreeland Ave., South Hackensack, N.J. 07606.

Tape Drive Unit Out for IBM User

ARLINGTON, Mass. — A tape drive unit designed for the IBM System/34, System/38 and 5280 has been announced by Mannheim, Germany-based Data Elektronik Gmbh.

The tape drive unit Series 5 has a capacity of up to 50M bytes and throughput of approximately 4K byte/sec. the vendor claimed. The controller allows the tape drive unit to be connected to a Twinax cable. This reportedly allows it to be recognized as a workstation by the computer.

The unit includes the tape transport, intelligent controller, software, housing and cabling for the price of $17,550, the vendor said from 1365 Massachusetts Ave., Arlington, Mass. 02174.

Processor Fits Motorola 68000s

LOWELL, Mass. — A hardware floating point processor designed for Motorola Semiconductor Products, Inc. 68000 microprocessor running on the Intel Corp. Multibus or Motorola VME-bus has been developed by Sky Computers, Inc.

The Sky Fast Floating Point (SKYFFP) single card processor is said to be capable of a 3-usec floating point add/subtract/multiply on 32-bit single-precision data and 12 usecs for 64-bit double precision data, according to the vendor.

Besides basic arithmetic operations, the unit reportedly performs square root, logarithmic and trigonometric functions. SKYFFP reportedly requires no modifications on existing Fortran, Pascal or C programs, the spokesman said.

Single-quantity price is $2,200 from Sky Computers, Foot of John St., Lowell, Mass. 01852.

Interface Targets DEC VT125 Users

BURLINGTON, Mass. — Texprint, Inc. has announced the Decolor PI-125, an interface option that allows users of Digital Equipment Corp. VT125 CRT terminals to print graphics or text images on a screen dump basis using Texprint's LA120 hardcopy terminals.

The Decolor PI-125 allows VT125 users to create and view full-color graphics images without the need for an additional color video monitor because the Decolor LA120 printed output provides the equivalent color "picture" directly from the auxiliary RS-232C port. The Decolor PI-125 prints 14 different colors with up to four densities when used with an upgraded LA120 printer, the vendor said.

The Decolor PI-125 costs $495, the vendor said from 8 Blanchard Road, Burlington, Mass. 01803.

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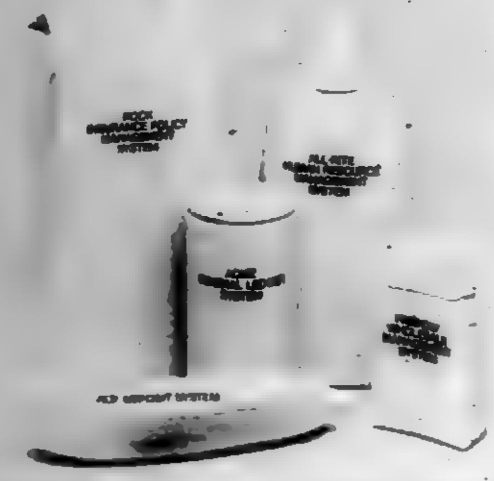

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Bits & Pieces

Cartridge Disk Drive Fits Compat/123 Processor

HUNTSVILLE, Ala. — General Digital Industries, Inc. has announced the Iomega Alpha-10, a 10M-byte removable cartridge disk drive for the firm's Compat/123 processor. The Compat/123 is based on a Digital Equipment Corp. LSI-11/23 processor.

The Iomega Alpha-10 offers hard disk capacity plus the convenience of a removable cartridge. The unit offers a 35M/sec average access time and a 896K-byte transfer rate, the vendor said.

The Iomega Alpha-10 costs $4,000, the vendor said from 7702 Governors Drive, Huntsville, Ala. 35805.

ECA Feature Repositions BT-1500 Printer Columns

MALDEN, Mass. — An electronic character alignment (ECA) feature that reportedly eliminates the need for a flight timing service call is available on the BT-1500 Band Printer from Data Printer Corp.

When a column of printing becomes displaced in a line printer due to high usage, the end user can reposition it with the help of the ECA, the vendor said. This feature is only available on the vendor's BT-1500 Bandtrain printer, which costs under $20,000. The ECA option is available separately for approximately $1,100.

Data Printer Corp. is at 99 Middlesex St., Malden, Mass. 02148.

Winnie Upgrade Program Targets Memorex Model 601

CANOGA PARK, Calif. — Datamemory Corp. announced what it calls the industry's first independent upgrade program for a Winchester disk drive by taking the discontinued Memorex Model 601 drive and upgrading the capacity from either 24M-, 50M- or 75M bytes to over 125M bytes.

Capable of storing up to 125M bytes of unformatted data, the drives are reportedly hardware compatible with the systems into which they are installed. The upgrade costs $3,000 from the vendor at 6750 Eton Ave., Canoga Park, Calif. 91303.

Carry-In Repair Option Announced by North Star

SAN LEANDRO, Calif. — A carry-in repair option for service on systems and peripherals has been introduced by North Star Computers, Inc. The company announced the carry-in option as a lower cost, more convenient alternative to the standard on-site service offered since last year.

The option allows users to either carry in or send their nonwarranty repairs to 13 depot sites located in the U.S. The sites are generally within overnight United Parcel Service shipping distance of any user, the vendor said.

Two types of payment plans are included as part of the new repair service. An annual depot service agreement is available that covers any necessary repairs including shipping costs back to the customer. Customers who don't want to purchase a service agreement can contact the depot nearest them to receive a return authorization when they run into a specific repair problem. The charge for this type of repair is a flat rate based on the required repair, a spokesman said.

The cost of the carry-in service for a standard dual floppy North Star Advantage would be $306/year. Comparably, the on-site repair would be $36/mo. Additional information may be obtained from the vendor at 14440 Catalina St., San Leandro, Calif. 94577.

Interface Card Ties MT 160 Printer to Apple II

SEATTLE — Mannesmann Tally, Inc. has announced an interface card that allows the firm's MT 160, a multifunction matrix printer, to be used with Apple Computers, Inc.'s Apple II microcomputers.

The printer is an 80-col. serial matrix printer capable of three-way paper handling with an optional tractor drive attachment and paper roll holder. The interface card is a single printed circuit board. The board is installed in the Apple II processor, and a cable connects to the printer.

The interface card costs $149 and the MT 160 costs $990, the vendor said from 215 Eighth Ave. N., Seattle, Wash. 98109.

BTI Mark II Version Of 5000 Mini Out

SUNNYVALE, Calif. — BTI Computer Systems has unveiled a Mark II version of its 5000 16-bit multiuser minicomputer, which BTI said is 50% faster than its current models.

BTI is also offering a field-installable Mark II Upgrade Kit.

The Mark II costs $38,950, the Upgrade Kit costs $5,000, from the vendor at 870 W. Maude Ave., Sunnyvale, Calif. 94086.

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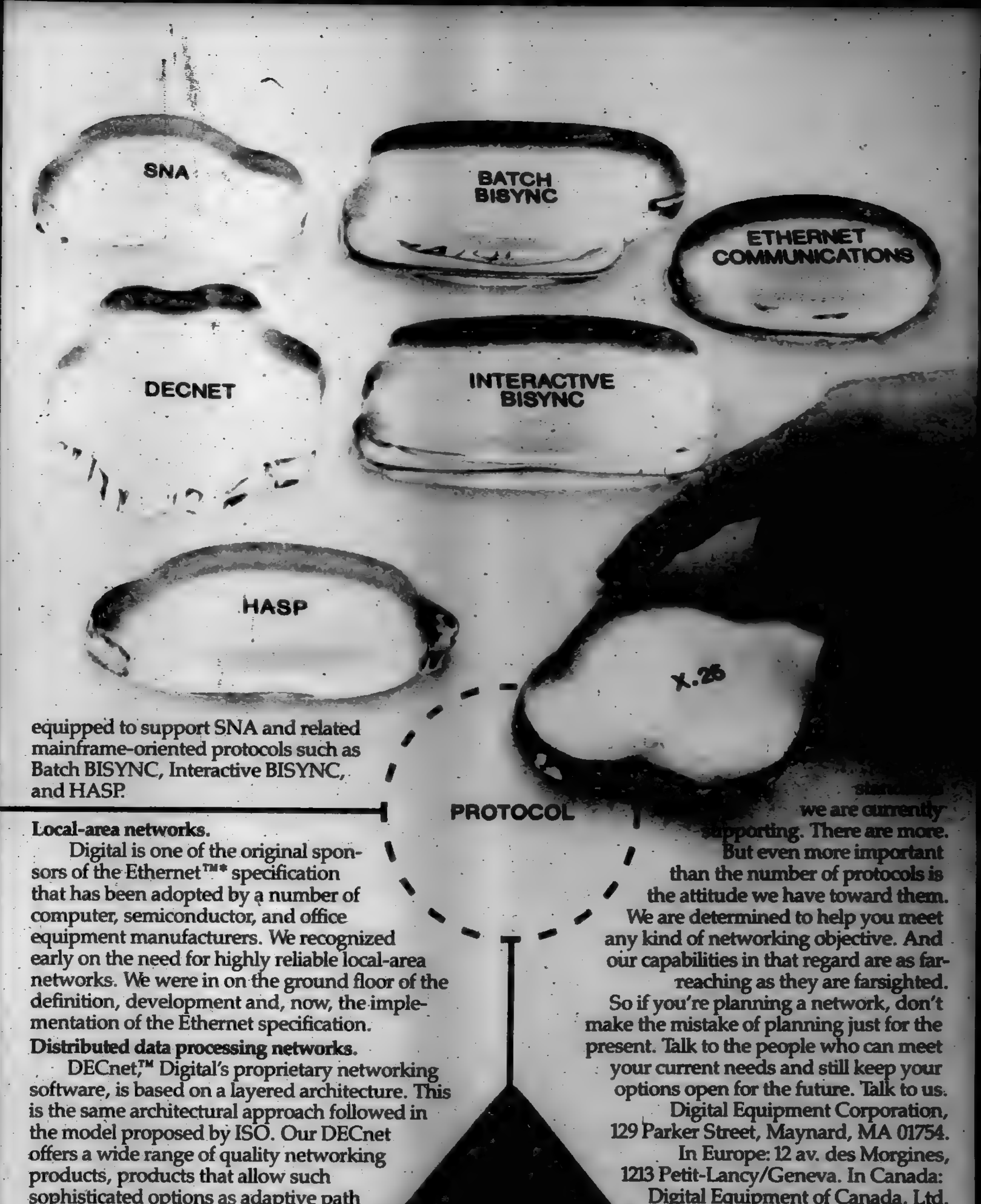

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Some High Marks, Some Questions

OA Experts File Mixed Reviews for Lisa

By Jim Bartimo
CW Staff

Office automation experts have given mixed reviews to Lisa, Apple Computer, Inc.'s recently released 16-bit microcomputer. The low cost and advanced engineering have received the highest marks while some still question its raison d'etre.

"I think it's a major technological feat to offer what they're offering for $10,000," said Patricia Seybold, of the Seybold Consulting Group in Boston. "I see it fitting into the high end of the market."

Seybold said Lisa is likely to be used by "professionals who do a lot of financial analysis and need report and graphics output" or by a manager of a project team.

Apple said one of Lisa's strongest points is its ability to integrate spreadsheet, word processing, graphics and data base capabilities. "I see it as the first of a generation of products that integrates capabilities," Seybold said, but warned, "I don't know if the market is ready for it right now."

Michael Hammer of Hammer and Company, Inc. in Cambridge, Mass., praised the quality of the hardware and software, but sees the function integration as a clouding of the machine's purpose. Although he has not yet studied the machine closely, Hammer was still skeptical.

'. . . its a major technological feat . . .' but, '. . . I don't know if the market is ready for it now.'

"It's approach is too general," Hammer said. "What's needed is a personal [decision support system] capability and Lisa doesn't have it. [The Lotus Development Corp. integrated software package for the IBM Personal Computer,] 1-2-3, is more specific . . . the user interface is very nice."

Calling other workstations such as the Xerox Corp. Star and the Grid Systems Corp. Compass "one-day wonders," Hammer wondered if the Lisa might be another flash in the pan. According to him, when users bought the Star and Grid systems they said, "it's real nice, but what are we going to do with it?"

An ideal system, Hammer pointed out, would be one that is integrated with the departmental and corporate levels of information processing. "I think Apple is going to have a hard time making it in large corporations," he said. "Apple doesn't have the image and experience with this group."

But another office automation consultant said that Lisa will "give Apple more of a presence," in a corporate environment because it is more of a business product. "When the Apple II came out — it was a quality product and it looks like they've done it again," said Thomas A. Hannagan of Hannagan & Associates, Inc., Schaumburg, Ill.

Comparing it to the Star workstation, Hannagan called Lisa a better product. "The Apple is clearly advanced in its ease of use and clear presentation," he said. "From the workstation standpoint, it's what eveybody's been waiting for — a Star at half the price."

Seybold also said that Lisa compares favorably with the Star, but criticized Lisa's slow response time and questioned some of the vendor's claims to ease of use. While the Apple claimed users can become proficient in half an hour, Seybold said the concepts may take as much as a day to learn.

But Seybold pointed out that even with these faults, Lisa may keep Apple on the corporate map. "There are a lot of companies who might have closed the door on Apple and standardized on IBM," she said, "if it weren't for Lisa."

Unix-Based Workstation Boasts Continuity, Ease of Switching

PACHECO, Calif. — Century Analysis, Inc. has unveiled a multiuser, Unix-based intelligent workstation with bundled software that reportedly provides continuity between facilities and ease of switching between functions.

Officeware uses an intelligent workstation based on two 16-bit Intel Corp. microprocessors. The 8086 contains 256K bytes of random-access memory and is used for applications. The 8088 contains 128K bytes of memory and is used for display purposes.

The workstation features an 80/132 col., 14-in., 820 by 600 pixel green phosphor CRT with fully tilting and rotating screen. The detachable keyboard has 105 keys.

The workstation may be linked to a Unix-based host and other Officeware workstations in a local-area network or to a mainframe-based local-area network. It also runs under operating systems from Digital Equipment Corp., Prime Computer, Inc. and Ryan McFarland Corp. It has no local storage.

The bundled software packages include:

- Officeware Script, a general writing instrument providing text, word and general information processing.
- Officeware Plan, a spreadsheet package with formula management, report consolidation and data manipulation.
- Officeware Forms, a methodology for providing list management, user-defined formats and protected/unprotected fields.
- Officeware Terminal, which provides emulation of Applied Digital Data Systems, Inc. Regent series, Televideo Systems, Inc. 950 and NCR Corp. 7900 series CRT terminals.
- Officeware Desk, with such personal utility functions as reminders, phone lists and calendars.
- Officeware Network, an electronic mail package featuring user-to-user facilities such as mail, network directories and telephone messages.

The mainframe host interface software serves as the link between the Officeware interface and support facilities and a specific operating environment. It costs $4,250/terminal unit.

The intelligent terminal and bundled software costs $3,500 from Century Analysis at 114 Center Ave., Pacheco, Calif. 94553.

DG Minis Get WP, Printing Aids

SAN FRANCISCO — Micro-Systems International Corp. has unveiled a multiuser microcomputer system with a distributed processing operating system. The operating system reportedly gives each user access to a dedicated processor and manages common resources like disk files and printers.

The Multi-Net system is compatible with Digital Research, Inc.'s CP/M operating system and features both a Zilog, Inc. Z80 eight-bit chip and an Intel Corp. 8086 16-bit microprocessor. Together, the two microprocessors can support up to eight concurrent users, according to a vendor spokesman.

As many as 16 of the machines, for a total of 150 users, can be tied together to form local networks that allow users to share both programs and data, the vendor claimed.

The Multi-Net system is packaged with a 1.2M-byte, 8-in. floppy diskette unit, a 20M-byte Winchester hard disk module and a 13.4M-byte cartridge tape system for backup.

A basic two-user system with a 64K-byte master processor, two user processors and a one-year warranty costs $9,995 from Micro-Systems at 12 Mercer Road, Natick, Mass. 01760.

Multiuser Micro Fits CP/M

PALATINE, Ill. — Compac Systems, Inc. has introduced word processing and printing software packages designed to run on Data General Corp. Nova and Eclipse minicomputers.

The 3 * 16 multiuser word processing package is said to offer password protections, global search and replace, instant top and bottom, underline, bold face, line centering, automatic word-wrap, stored phrases and mailing list merge functions.

The Remote Active Printer (RAP) is a spooler and remote slave printer control software package available for users of DG Business Basic, available from the vendor. It allows the user to implement the optional slave printer port on DG and compatible terminals.

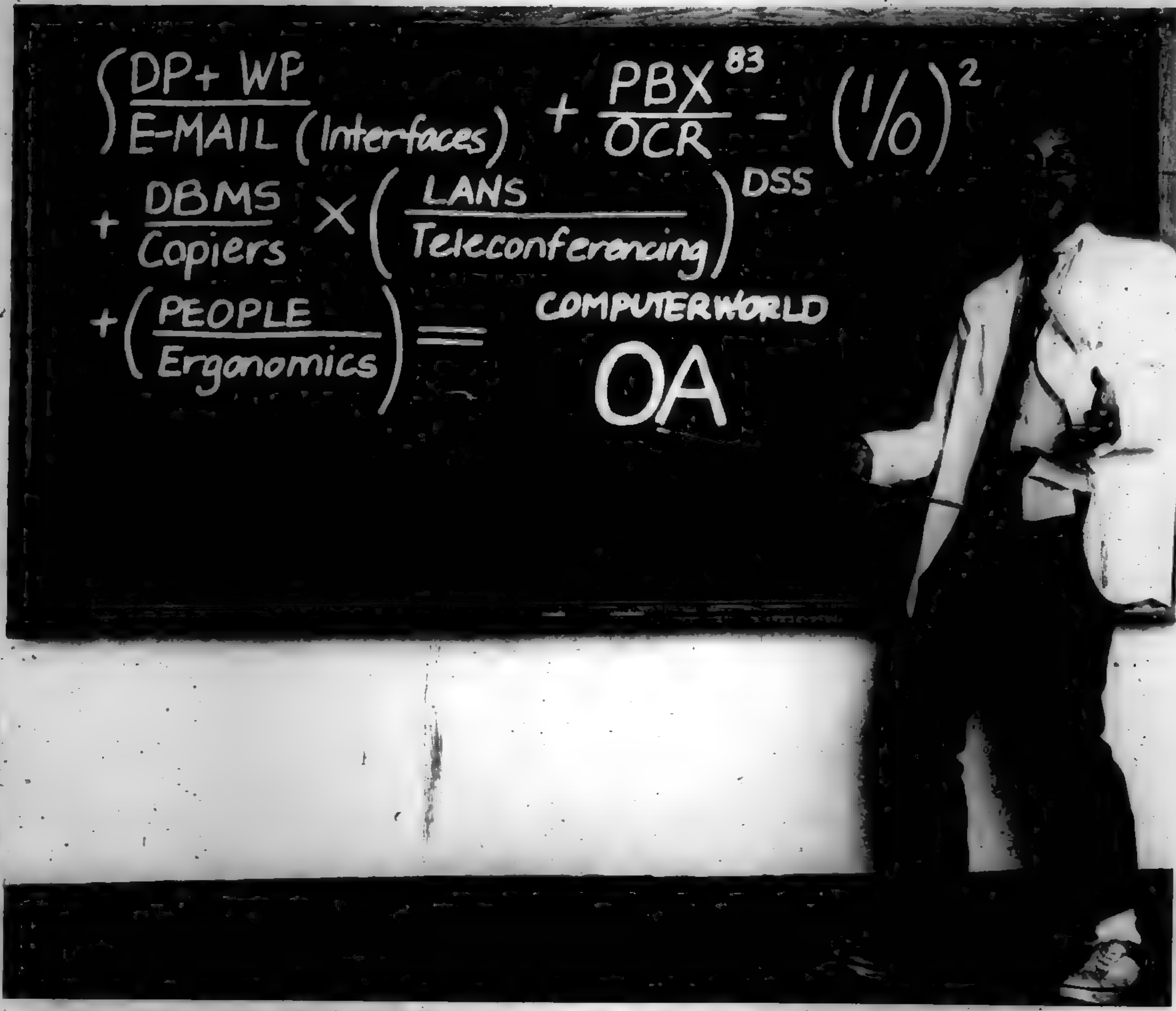
The word processing package is available for $1,150; RAP for $349 from Compac Systems, Inc., 59 E. Cunningham Drive, Palatine, Ill. 60067.

WP Package Available for Apple II

HARRISON, N.Y. — Beaman Porter, Inc. has introduced a word processing package for the Apple Computer, Inc. Apple II. Among the package's features are automatic indents and automatic script formatting.

The Powertext package includes a 10-lesson tutorial in addition to a reference manual. Other features include a disk-based editor, user-definable function keys and word-by-word cursor movement.

The package is available for $299. A version that includes uppercase and lowercase and shift key capabilites is available for $329.95. A version for the IBM Personal Computer is available for $399 from Beaman Porter, Inc., Pleasant Ridge Road, Harrison, N.Y. 10528.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Ex-Intel Employees Join Forces To Form Firm

By Robert Batt
CW West Coast Bureau

PORTLAND, Ore — Seventeen Intel Corp. employees, who resigned en masse from the semiconductor manufacturer last month, have formed a computer company of their own and are seeking venture capital.

The Gang of 17, led by Casey Powell, former general manager of Intel's microprocessor operation and president of the new company, and Larry Wade, a former manager in research and development, are currently developing a business plan to present to potential investors. The company has yet to be given a name.

(Continued on Page 84)

Difficulties Ironed Out On 5860: Amdahl Execs

By Robert Batt
CW West Coast Bureau

SUNNYVALE, Calif. — Performance problems on Amdahl Corp.'s 5860 processor have been ironed out and volume shipments are underway with over 180 machines due to be shipped this year.

This was the message delivered to a group of financial analysts and trade journalists here recently as Amdahl executives sought to deflate speculation that it was in trouble on its latest 580 series mainframe.

"The performance difficulties on the 580 series are behind us, the necessary engineering changes have been incorporated and the enhanced machines will be shipped to customers within the next two to three months," said Wayne McIntyre, director of product marketing at Amdahl.

To date 18 processors in the 580 series have been installed. These will also receive the performance enhancements, McIntyre added. Reportedly, it was delays caused by problems in meeting performance benchmarks that confined shipments of the new processor in 1982.

McIntyre said that the design problems that needed to be addressed were supervisor state performance programs that keep track of jobs currently in the processor and which monitor peripheral devices and transactions coming in from terminals.

"The instructor we worked on in the 580 was the instructor that does these tasks. Machine performance will be raised between one-quarter and one-third as a result of the design changes," he claimed. So far the design changes have only been tested in-house and have yet to be incorporated in any customer installation.

McIntyre explained that the problem was not that the instructors didn't work

(Continued on Page 80)

Beats Out Burroughs

Sperry Wins $476.2 Million Pact

WASHINGTON, D.C. — Sperry Corp. has defeated Burroughs Corp. in a two-year procurement contest for a $476.2 million Air Force computer upgrade contract, considered the largest commercial DP contract ever awarded.

Having prevailed in a 26-month "compute-off" competition, during which the two firms pitted their systems against each other at several military sites, Sperry will begin delivery in May of 153 1100/60 systems to more than 100 Air Force bases around the world. The systems will replace 20-year-old Sperry and Burroughs systems used for administrative support.

The Air Force spent $98.4 million to conduct the unusual competition, but Russel D. Hale, assistant Air Force secretary for financial management, estimated the government saved more than $335 million by making the two companies prove the worth of their systems before the contract was awarded. Sperry teamed with Computer Sciences Corp. to convert more than 1.5 million lines of software to develop its system for the "Phase IV" contract. Burroughs used Planning Research Corp. (PRC) for systems and software support for its entry.

Although both companies showed they could do the job, the award to Sperry was based "predominantly" on the firm's price, according to Hale, who said the winning bid was more than $60 million below the Burroughs figure. Joseph J.

(Continued on Page 84)

Integrated Planning Staff Busy With Stratagem Conversion

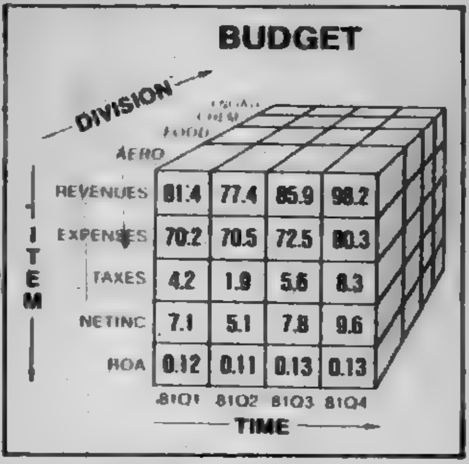
By Lois Paul
CW Staff

BOSTON — Conversion weighs heavily on the minds of the 14-member staff at Integrated Planning, Inc. here these days.

The developers of the Stratagem decision support system (DSS) for IBM mainframes have a number of changes in the works, evident immediately by the flurry of activity at a bank of terminals in its offices in Boston's Back Bay area.

The technical development staff, led by vice-president and co-founder Mark Gelfand, is in the process of converting the source language for Stratagem from AED to reentrant C. This is targeted for completion by fall of 1983. The plan is to make Stratagem available to the IBM mainframe market, as well as to users of any system with a C compiler and a Bell Laboratories Unix operating system. This may be via a hardware/software combination or as a stand-alone software package. It opens the door to the 32-bit desktop market, including Apple Computer, Inc.'s recently announced Lisa, according to Bennett Da-

(Continued on Page 78)



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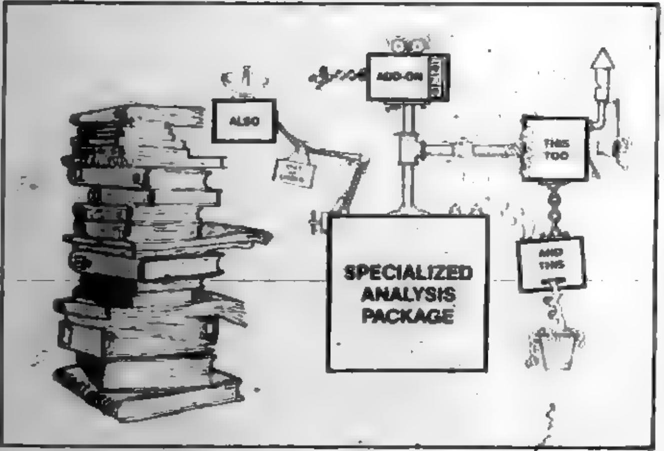
Conversion in the Works for Stratagem Creators

(Continued from Page 77)

vies, vice-president of marketing.

The software is not the only thing on the threshhold of change at Integrated Planning. Currently housed in a suite of unconnected, crowded offices, the staff is preparing for a move to more comfortable quarters in downtown Boston. The sense one gets is that the firm is still one of the smaller new faces in the DSS market, but is gearing up for substantial growth within the next few years. The staff expects sales to double in 1983.

Davies explained that the move to C and Unix is a response to the trend for more processing at the local level. "We want to deliver Stratagem at a level where hardware is reasonable in price, yet processing capability is sufficient to do modeling." According to Gelfand, the conversion also will make Stratagem faster and able to handle efficiently more simultaneous users.



Stratagem aims to replace patchwork solutions.

Unlike some of the firm's competitors, who are offering versions of their products for the 16-bit marketplace, Integrated Planning will not go this route. "We are bringing an identical version of the product to the small machine," Gelfand explained. "I am not sure if we could, or would even want to, start performing surgery on Stratagem to get it running on the existing IBM Personal Computer. If it comes up to [Motorola, Inc.'s] 68000 size, maybe."

Birgul Erengil, president and co-founder of Integrated Planning, explained that the firm currently is looking for a 32-bit machine on which to begin testing Stratagem. She said they are looking also toward instituting a new time-sharing pricing scheme for Stratagem this spring. "We are planning to make available a fixed-cost per user ID basis — say $3,000 a month and all you can do on a user ID."

Stratagem, which runs on IBM and plug-compatible mainframes under VM/CMS or MVS with TSO, has been marketed for about a year. There are 15 users to date, half of which are running the product on in-house systems.

Stratagem was deliberately designed not to be a modularized system. The developers of the product saw that successful packages evolved during the 1970s to handle data management and query, financial modeling and statistical analysis. "We just thought that the way to do it is not to kludge on module after module over a period of five or seven years," Davies said. "This would present lots of drawbacks in terms of ease of use and computer efficiency. Instead, we decided to wipe the slate clean and come up with a grandiose design and put those capabilities in one system."

"Stratagem as a tape on a computer is not a decision support product," Davies said, adding that it only becomes a DSS in the context of having some important information with which to link it and some objectives in terms of providing a level of analysis.

Graphics Market Growth Seen Fueling Sales to $17 Billion by '87

SAN JOSE, Calif. — "Explosive growth" in the computer graphics market will fuel sales to a compound annual rate of 41.6%, topping $17 billion by 1987, according to a market analysis report from Creative Strategies International, Inc. (CSI), a market research and consulting firm. However, CSI noted that the current 4% Japanese share of the U.S. market could increase to 30% by 1987 and, possibly, to 80% by 1990.

More diverse applications and new market niches are also predicted as competition moves rapidly toward a strong focus on applications rather than technology. Primary market trends are toward raster technology, color, applications software, 32-bit technology and quality hard copy.

Computer Graphics indicated that computer-aided design and manufacturing (CAD/CAM) will be the fastest growing application and that a new low-end CAD/CAM market "holds great promise in the '80s." Raster technology is expected to continue gaining over other display technologies. The raster nonimaging processing displays/systems segment will see the sharpest growth, with sales increasing at a compound annual rate of over 60% through 1987.

The report examined the market for hard-copy devices and turnkey systems houses, changing industry structures and competitive environment by market sector. Company profiles and market-share data are included.

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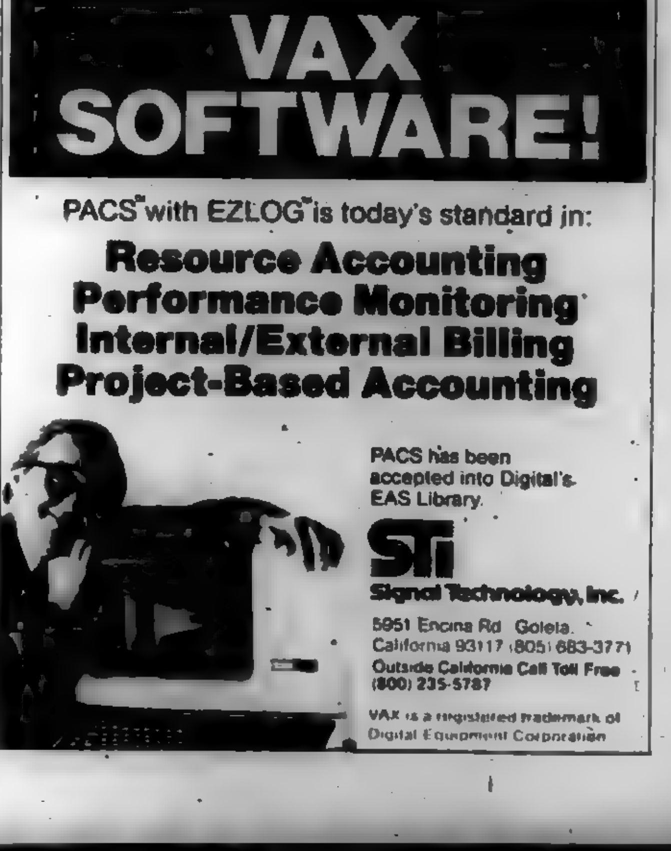
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Protectionist Sentiment Likely on Capitol Hill

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The growing protectionist sentiment on Capitol Hill, which was barely kept in check last year, is likely to reappear with added vigor at the recently convened 98th Congress, observers feel.

But while it may seem more likely that the U.S. will initiate some sort of trade action to reduce its mounting trade deficits, particularly with Japan, it is not a foregone conclusion. And most electronics industry observers said, publicly at least, that it would be in the best interests of all concerned if some way can be found to ensure fair trade between the two industrialized powers.

The Semiconductor Industry Association (SIA), which has been at the forefront of lobbying efforts aimed at raising fair trade issues in Washington, is giving what may be one last try to ease purported trade differences with Japan. The growing interdependence of the electronics industries in the two countries makes some civil accommodation very important, according to Warren Davis, SIA director of government affairs.

Analysis

"This is a global industry, and it's becoming more global all the time. As we go through this process, millions of dollars are being invested in Japan for

(Continued on Page 86)

Execs: 5860 Problems Ironed Out

(Continued from Page 77)

but they did not go fast enough. "It was not a question of us being surprised because we had forgot something. It was simply a question of making those instruction sets more efficient. As far as essential functions are concerned, nothing has changed," he told his audience.

Company officials admitted that the introduction of IBM's MVS/SP Version 2 Release 1 and data management facilities — the so-called MVS/XA software product — could cause Amdahl to add more instructions to its 580 series.

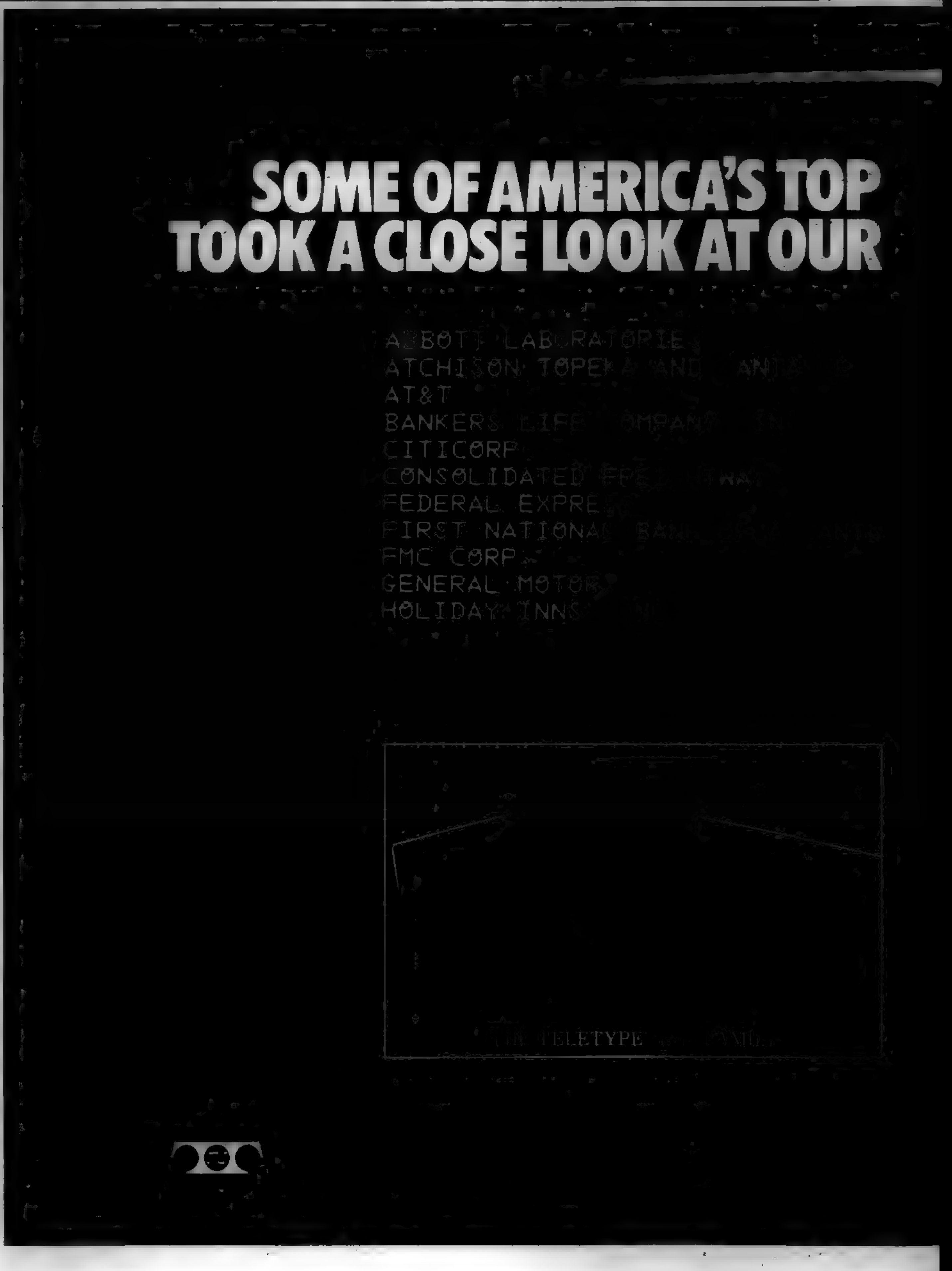
"We have a project team working on implementing XA on our machines, although we believe the 580 already has the necessary capabilities, but we could be surprised. However, based on what we anticipate the XA is going to be, there are no show stoppers to implementing XA on both the 580 and 470 line of processors," asserted Kenneth Simonds, executive vice-president.

Supply Problem

The company said it expects demand for the 580 to come from many different industry sectors. "Our greatest problem with the 580 in 1983 will be a supply problem, and customer waiting time will be around four to five months," Simonds warned. Production of the system is expected to reach its peak in the second half of this year. Of the 18 systems so far installed, 50% are hooked up to IBM 3380 disk systems, and 80% run under the MVS operating system.

In reply to a question about processor power, McIntyre said that a 40 million instructions per second (Mips) processor was feasible during this decade based on the wide variety of technologies currently available. However, as far as competition from IBM is concerned, he asserted its thermo conduction module (TCM) package is not good enough to achieve that capacity. "We expect TCM to be capable of dealing with 25 to 30 Mips at maximum," McIntyre added.

There has been some speculation among industry analysts that using its current air-cooled systems, Amdahl would not have the technology to compete with a 40 Mips machine.



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Larry R. Harris

As Info Center 'Supervisor'

AIC Exec Envisions Intellect's Role

By Jenny Charlesworth
CW Staff

WALTHAM, Mass. — The developer of one of the first commercial implementations of artificial intelligence technology claims to have found a new niche for its product in the growing number of information centers.

Larry R. Harris, president of Artificial Intelligence Corp. (AIC) and co-developer of Intellect, a natural language query system, explained in a recent interview that he envisions Intellect as a "supervisor" of the information center. Intellect, he said, will drive the other end-user-oriented tools.

"No one buys the system because it is an artificial intelligence system. They buy it because it lets them access their system," Harris said.

This new emphasis on the use of Intellect as an end-user interface to other information center tools is coincident with the company's recent unveiling of an enhanced version of the Intellect Series 200 [CW, Jan. 10].

In an information center environment, there may be several different end-user-oriented tools and, thus, users have to learn several different languages to make use of these offerings. Using Intellect as a front end to the other tools will eliminate this problem, Harris claimed.

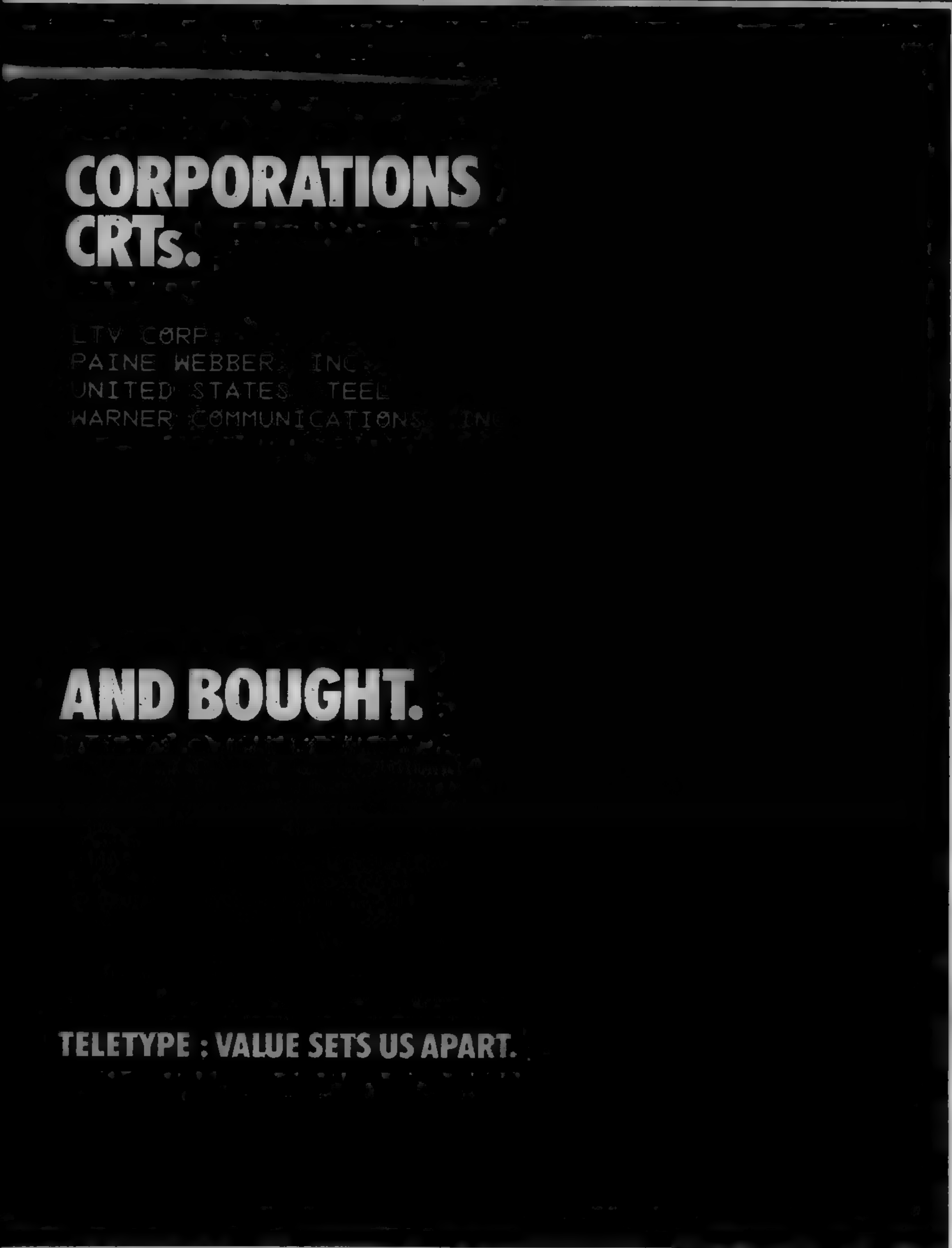
"To make real use of the tools, you would want to use them together. Instead of taking data from the data base, running to the modeling system, then to the graphics system, Intellect 200 can accomplish all these tasks," he continued. "A user can come to the information center through Intellect. Effectively, it will be driving the data base system and also taking responsibility for the communications."

Harris noted that because Intellect's first implementation was as a query language interface for a data base management system, people tend to see the product only in this role.

"Basically," Harris said, "Intellect is not a data base query system. It is a natural language understanding system. It can also be used as the front end of a decision support system, graphics and so forth."

Another reason the product is suited for information center users, Harris said, is its handling of ambiguities. For a nontechnical person, the probability of his being misinformed by Intellect as opposed to using a formal system is much, much less, he said. For example, if Intellect sees a word that it has never seen before, it isolates it to give the user a chance to change it or define it.

"The burden is on the system to understand you rather than on the user to understand the system," Harris concluded.



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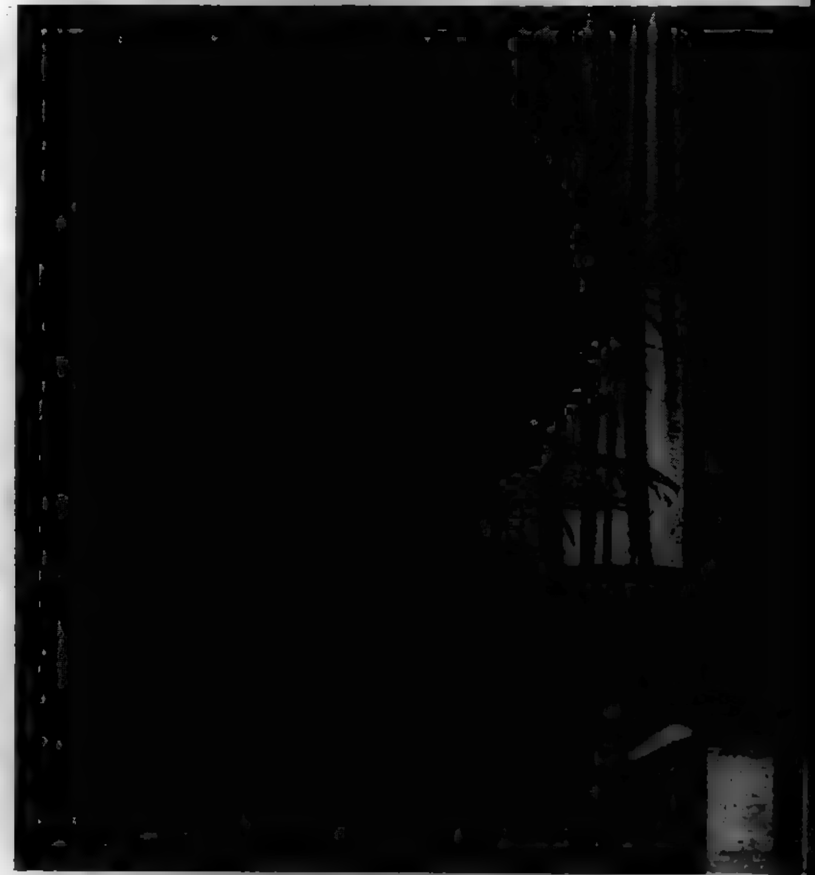

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OFFICE SYSTEM

Ex-Intel Employees Join Forces to Form Firm

(Continued from Page 77)

The mass resignation, the largest defection in Intel's history, will, according to company officials, pose no serious threat to the chip manufacturer's on-going work. An Intel spokesman asserted: "In the long term, the resignations will have no strategic impact on the company and will not deter our strategic direction. Individual projects will be hurt over the short term and some key people will need to be replaced."

This assessment was shared by Wade, who argued that since the people who resigned came from several different groups, the impact on any one Intel project should be small. The resignations came from three major OEM areas within the company's plant at Aloha, Ore. — systems, module and strategic systems operations.

Industry sources speculated that the 17, who include former Intel specialists in hardware and software engineering, marketing and line management, were carefully chosen to avoid the kind of lawsuit filed against former Intel employees when they left to form a new company, Seeq Technology, Inc., in January 1981. The suit, which involved trade secrets relating to memory chip technology, was settled out of court.

Wade, vice-president of the new venture, explained: "We have not yet created a business plan since we wanted to leave Intel before doing that. All we can say at this time is that we have lots of ideas and we haven't yet decided which ones to pursue."

He denied that a wage and salary freeze imposed late last year at Intel had prompted the mass resignations and described the relationship between Intel and the ex-employees as "cordial."

"Salary did not influence our decision to leave in any way," Wade said. "It was simply a case of the great American dream, to go off and form our own company."

> *'It was simply a case of the great American dream, to go-off and form our own company.'*

Sperry Defeats Burroughs For $476.2 Million Pact

(Continued from Page 77)

Kroger, president of Sperry's Computer Systems Division, said the contract will mean approximately 2,000 new jobs for the firm, some of which may be filled by members of the losing Burroughs-PRC team, he said.

"Obviously I discounted to get this bid," Kroger said at a Jan. 31 Pentagon press briefing on the contract. The contract runs for eight years with two six-year options, which if they both also go to Sperry could bring the contract's final income to the company to well over a billion dollars, according to one estimate. Kroger called the compute-off "a tough competition" and remarked that the award to Sperry creates "a difficult situation for [Burroughs Chairman Michael] Blumenthal and Burroughs.

More than 100 firms were asked to respond to the original contract proposal, issued in December, 1978, but Burroughs and Sperry were the only two firms willing to devote their resources to the 26-month compute-off.

Political Changes

Several other firms objected to the way the proposal was structured and the House of Representatives Government Operations Committee insisted on several major changes to the contract plan.

The committee is satisfied with the way the competition was structured but wants to make sure the compute-off was properly handled, the aide said.

The first Sperry system is slated for installation at Langley Air Force base in Virginia this spring, with the rest to be delivered during a 29-month period. Hale said that at 20 to 29 bases the Air Force will install dual systems, with one of each pair housed in a mobile, "tactical shelter" for survival purposes.

In addition, the Air Force plans to establish 14 regional systems for distributed data processing support of its bases under the new contract. The world wide Sperry system will include more than 7,000 terminals linked to the 1100/60 mainframes via $20 million worth of telecommunications facilities, the government said.

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A

Marketing Seen More Decisive Than Technology

By Robert Batt
CW West Coast Bureau

PALO ALTO, Calif. — The most successful computer manufacturers in the 1980s will be those having superior marketing organizations rather than technological advantages, a number of management consultants and industry analysts have claimed.

Dan Rubin, a management consultant at SRI International of Menlo Park, Calif., claimed that manufacturers driven by technological advantage are largely a thing of the past. Instead, he said, marketing expertise and software services will determine success in the user marketplace.

"The issue is no longer whether you can produce a better product than IBM, for example, because that's not what sells it these days," Rubin said.

"The major issue now is, can you give your customers the service they require, and the focus needs to be on promotion, distribution and packaging of the product in a way that meets those requirements. Users are less willing to put up with problems than they were because they can get a good machine from another vendor if they need to."

Winners and Losers

According to Cliff Higgerson, director of research at financial analyst Hambrecht and Quist, it is the marketing and service a manufacturer provides that will separate the winners from companies that do not survive in the long run.

"Customers are not going to buy a product just because it is a better mousetrap, it has to provide value to the user in solving problems. What is important to users is reliability, lower costs and back-up services, and so just because a company has a better technological product than its competitors is no guarantee of success," he said.

Many analysts had picked Sperry Univac in the late 1950s and early 1960s as the company that would lead the mainframe charge in the future. It was assumed that Univac had superior technology to that offered by IBM and would thus emerge as the market leader.

History proved the analysts wrong, however, as IBM assembled a marketing machine second to none, and today it is several times larger than Univac or any other of its competitors.

Frank Petro, vice-president of information technology at management consultant Arthur D. Little, Inc., said the ability of vendors to communicate effectively with top-level end-user managers will determine whether they are successful or not.

"The prosperous manufacturers in this decade will be those companies whose orientation and culture is focused on solving business problems rather than the strength of the technology itself," he said.

"Some companies are better prepared to communicate with decision makers than others. You need sales people who can communicate with top-flight executives, and that requires people of high managerial caliber rather than someone who can only talk about how the machine works," he added.

Protectionism Returning to Hill

(Continued from Page 80)

subsidiaries of American companies," Davis said, noting the multimillion dollar new plant investments in Japan of IBM, Motorola, Inc. and other U.S.-based manufacturers.

"By the same token," he continued, "[Japanese] plants are coming up here — [NEC Information Systems, Inc.] in Roseville, [Calif], in Dallas for Hitachi, and San Diego for Fujitsu, and Silicon Valley for Toshiba and others. The two countries are becoming much more interdependent because of these investments as times goes on."

Davis added that there are other global reasons for settling trade disputes amicably. "All the rest of the world, be it Mexico, South Korea or France, ... is looking to see in high technology what the U.S. and Japan do, and whatever we do it's going to be emulated around the world ... The stakes are far higher than the U.S.' and Japan's particular quarrel with one another in high technology."

The electronics industry has long been an advocate of free trade, not only because U.S. companies rely so heavily on revenues from abroad, but also because no healthy company likes to see government interference in its marketplace, either at home or abroad.

Lloyd Kaufman, director of trade for the Computer and Business Equipment Manufacturers Association, remarked that the idea of the federal government's setting an industrial policy for the DP/telecommunications industry "bothers the hell out of us."

And just as the U.S. electronics industry fears government interference, it knows federal intervention aimed at promoting reciprocal trade agreements could speed regulation of the industry abroad.

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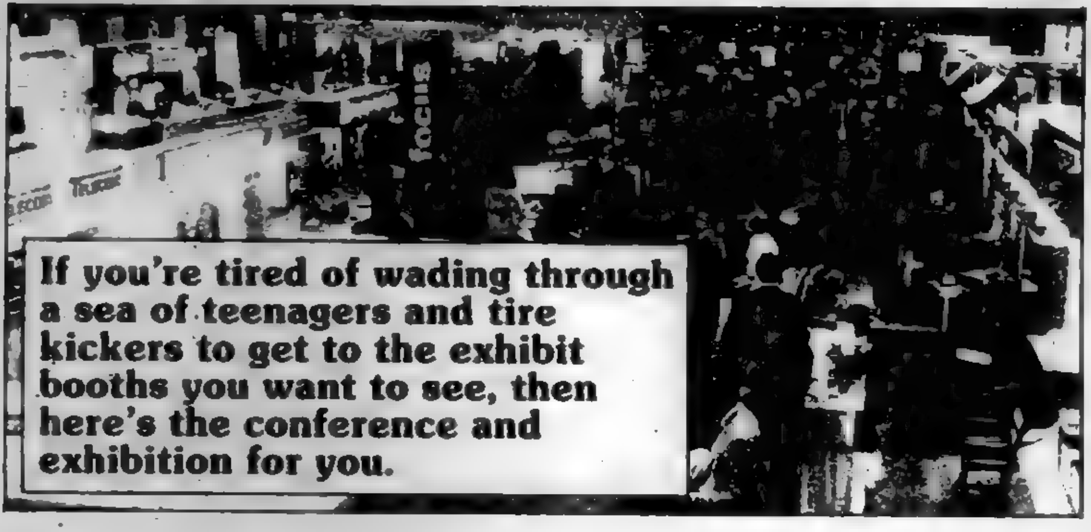

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STRATUS VS. TANDEM

(Or how the hardware fault tolerant solution supersedes the software based solution.)

> *"If you drive down the cost of physical hardware, you can make typically redundant paths for less money. Not surprisingly, most redundancy breakthroughs that will occur happen in hardware rather than in software.*
>
> *You can build a double computer inside one box for less dollars, as opposed to doing it in software, which continually needs maintenance and revision, as well as improvement."*
>
> by Aaron Goldberg of IDC which appeared in *Computerworld's* December 28, 1981 issue

STRATUS/32 – SYSTEM HIGHLIGHTS

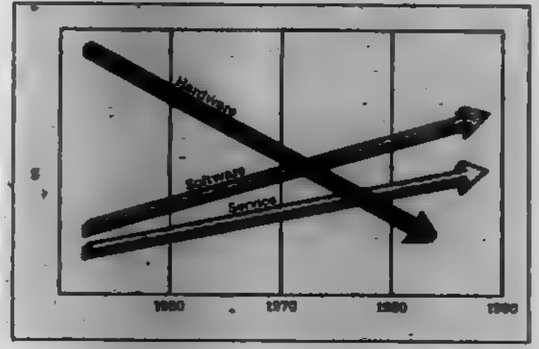
1. A simple hardware solution to fault tolerance that totally eliminates the need for extra application design and additional programming.
2. A design without performance penalties for fault tolerant operation – NO CHECKPOINTING!
3. A computer that pinpoints and isolates its failures, so repair is made quickly and inexpensively.
4. A system that can expand to 32 Fault Tolerant Processing Modules under a "single system image."

Now that the computer age is in full stride, 100% availability is fast changing from a luxury to a necessity. Downtime and its costs are unacceptable, especially when there is an alternative. Now that fault tolerant operation is becoming a universal requirement, there is demand for an improvement over the software approach used by Tandem. These computers must provide better performance, be easier to use, be easier to program and re-program, be less complicated and less expensive. We believe that the Stratus hardware based fault tolerant system answers these demands. Let us explain.

Why more hardware is better than more software.

The crux of the problem with software based systems is that they require complex, performance stealing software to provide fault tolerant operation. This software robs the system of precious resources because it uses processing cycles to pass status and checkpoint information back and forth between two computers. What's more, this passing of information can occur at four levels: operating system, user program, file management, and terminal control.

Stratus, meanwhile, has eliminated all this reliability software by having duplicate hardware components tightly coupled, dedicated to performing the same tasks at the same time. It's like having two computers in one, rather than two separate computers. Checking hardware logic detects errors with no performance loss and stops failing components instantly. The duplicate partner continues without interruption, unaffected by the failure. This is all transparent to the programmer and the user. With Stratus, there is no performance or data loss when there is a failure, no operator intervention, and no special programming.



While software costs will rise because they are people dependent, experts agree that hardware costs will continue to fall

Why Stratus is easier to implement.

The Stratus designer and programmer might as well be dealing with a conventional computer; one of them, not two.

Programmers are in a familiar environment. By providing industry standard languages, applications can be moved over without redesign or major reprogramming. Fault tolerant operation is a bonus, not a complex effort.

Since there is no checkpointing with the Stratus hardware based solution, the applications designer and programmer is never concerned about overhead for fault tolerant operation. They view the system as a single computer; unconcerned that there are two computers running together.

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Executive Corner

• **Christopher J. Lynch** has been named president of Cosmos Systems, Inc. and elected to the board of directors.

• **Donald W. Van Buren** has been appointed president of Comdisco Maintenance Services, a subsidiary of Comdisco, Inc.

• **William F. Rigby** has been appointed president and chief executive officer of Point 4 Data Corp.

• **Basil A. Beneteau** has been appointed director and vice-chairman of Northern Telecom Ltd. He has been succeeded as president of Northern Telecom Canada, Ltd. by **David G. Vice**.

• **Robin A. Reyes** has been appointed president of Software International Corp., a subsidiary of General Electric Information Services Co.

• **Terry D. Carder**, president of Reynolds & Reynolds, Inc., has been named chief operating officer. Appointed group vice-presidents were **Lee C. Lewis**, business forms; **Arnold H. Cantrell**, computer systems; **Budd L. Tipple**, systems development and support; and **R.H. Grant III**, international.

• **Robert A. Holzinger** has been appointed executive vice-president, systems development; **Anthony J. Mangan**, vice-president, information processing; and **William J. Rikkers**, executive vice-president, administration, of Northwest Computer Devices, Inc., a unit of Northwest, Inc.

• **William P. Meehan**, former vice-president and treasurer of Motorola, Inc., has joined Datapoint Corp. as executive vice-president, finance, and chief financial officer.

• **Ronald L. McKee** has been appointed vice-president, technical services, for National Advanced Systems, Inc.

• **Gary W. Hedge** has been named corporate vice-president at Mini-Computer Business Applications, Inc.

• **Wolfgang H. Schwartz**, manager of Rolm International Telecommunications Division, has been named a vice-president of Rolm Corp.

• **Richard C. Perkinson** and **Stewart L. Stokes** have been named vice-presidents of Q.E.D. Information Sciences, Inc.

• **Lewis Wolfson** has been promoted to vice-president of the Business Systems Division of I-Concepts, Inc.

• **Robert H. Dugan** has been named to the newly created post of senior vice-president, financial services.

• **James A. Cote** has joined Tricom Systems Corp. as vice-president of sales and marketing.

• **Bart Davis** has been named vice-president of production for NLT Computer Services Corp.'s Direct Response Division.

• **Herb Espeland** has been appointed to the newly created post of vice-president of quality assurance and product support at Century Data Systems, a subsidiary of Xerox Corp.

• **Michael A. Koulopoulos** and **Julian Soshnick** have been elected vice-presidents of Analogic Corp.

• **Paul H. Bosse** has been named senior vice-president of finance and chief financial officer for System Industries, Inc.

• **Ernest J. Porcelli** has been named president and chief operating officer of Direct, Inc., succeeding Direct co-founder **John B. Darke** who has been named chairman of the board.

• **B. Carl Lee** has been appointed vice-president and chief financial officer at Beehive International.

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Despite Current Market Share of 4%

Japanese Dominance in Graphics Seen Coming

By Robert Batt
CW West Coast Bureau

SAN JOSE, Calif. — Japanese competition in the computer graphics industry, which up until now has been negligible, could explode into a position of dominance within the next few years, according to a recently published report.

Entitled "Computer Graphics," the report by Creative Strategies International claims the current Japanese graphics market share of about 4% could increase to 30% in three years and to 80% by the end of the decade.

The report also claimed the West has been lulled into a false sense of security by the relatively slow growth of the Japanese computer graphics industry to date.

"There is an assumption among domestic manufacturers," the report stated, "that the Japanese will not be able to come up with the software to support a really competitive graphics capability. Our research, however, shows they are well positioned to interface with the West to get the software they need. In addition, they are working on manufacturing their own software."

The report explained: "The turnkey segment [of the market] is the cornerstone of the computer graphics industry, providing complete systems as well as software and services.

"Nearly a quarter of all gross OEM revenues, however, are derived from an overlap of components revenues between OEM's and turnkeys. Continued overlap is expected to approximate 30% of future gross OEM revenues."

"Computer Graphics" is priced at $1,450 from Creative Strategies International, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

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Packet Mart Examined

NORWALK, Conn. — The packet switching services market will head toward the $4 billion level in annual sales within 10 years, with AT&T taking an increasingly significant share of the market, according to a research study released by International Resource Development, Inc. (IRD) here.

The report, "Packet Switching — Public Services and Private Systems Market," also predicted that as many as five new suppliers of packet switching services may enter the market within the next two years. This continued rapid growth and vendor involvement is expected to lead to increasingly strong pricing competition.

The report examines the effects of pricing competition on GTE Telenet Communications Corp.'s Telenet and cites market factors and trends seen contributing to recent and future market growth. It also looks at the entry of IBM and AT&T into the packet-switched arena.

"Packet Switching — Public Services and Private Systems Market" costs $985 and is available from IRD at 30 High St., Norwalk, Conn. 06851.

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Telecom's PBX in Japan

Mitsui to Distribute SL-1

NASHVILLE, Tenn. — Northern Telecom, a subsidiary of Northern Telecom, Inc., and Mitsui & Co., Ltd. of Japan have signed a long-term agreement under which Mitsui will distribute Northern Telecom's SL-1 series of private branch exchanges (PBX) in Japan.

The agreement will make Northern Telecom's SL-1 systems available in Japan for the first time. The two companies said they hope to establish a relationship with the Nippon Telegraph and Telephone Public Corp., the state-owned telephone company, and to sell SL-1 systems to Japanese end users directly and through subdistributors.

Mitsui, headquartered in Tokyo, is one of Japan's largest general trading companies. The SL-1 is Northern Telecom's mainstay in the PBX market, with over 5,000 systems installed worldwide.

Mergers & Acquisitions

Shareholders of both firms have approved plans for **Xerox Corp.** to acquire **Crum & Forster**, a property and casualty insurer with headquarters in New York. Xerox will pay $55 for each of Crum & Forster's 28.7 million outstanding shares of common stock.

Shareholders will have the choice of receiving cash or a combination of Xerox common and new Xerox preferred stock. Crum & Forster will become a Xerox subsidiary.

Honeywell, Inc. will acquire **Disc Instruments, Inc.** of Costa Mesa, Calif., from **Finnegan Corp.** through the purchase of all of Disc's common stock for $8 million in cash.

Datacrown, Inc., Toronto, has acquired **Shell Canada Ltd.'s** unit **Sheltech Micrographics**, a supplier of computer output to microfilm (COM) services. In a related agreement, Shell has signed a long-term contract with Datacrown for COM services.

Duke of Energy Corp., Dallas, Texas, has signed a letter of intent to acquire **Terminals Unlimited,** Falls Church, Va., for 3.5 million shares of Duke of Energy common stock valued at $21 million.

Parameter Driven Software Northwest, Inc., Beaverton, Ore., has purchased the **Burroughs Division** of **Timberline Systems**, also of Beaverton. Details of the sale were not disclosed.

SEI Corp. of Wayne, Pa., has acquired all the outstanding common stock of **TMI Systems Corp.**, Lexington, Mass., for $12 million in cash and stocks.

National Tel Data Corp. of Ann Arbor, Mich., has acquired **Infoserv, Inc.**, a Michigan-based telecommunications marketing and consulting firm.

Visual Technology, Inc., Tewksbury, Mass., has completed acquisition of **Ontel Corp.**, which is based in Woodbury, N.Y.

Evans Griffiths & Hart, Inc., Lexington, Mass., has purchased all of **Interactive Information Systems, Inc.'s** business interests in the ROSS/V software package.

ROSS/V was originally developed by Evans Griffiths & Hart under a joint business agreement with Interactive Business Systems and Online Data Processing, Inc. of Spokane, Wash. Online's participation in the product remains unchanged.

Nickels & Dimes

Mountain Computer, Inc. has received a total of $500,000 in venture capital from San Jose Capital Corp., San Jose, Calif., and PCF Venture Capital Corp., Burlingame, Calif.

$$$

Excelan, San Jose, Calif., has received venture capital funding from a group led by Bay Partners, Mountain View, Calif.; Dougery, Jones and Wilder, San Francisco; Hambrecht & Quist, San Francisco; and Ventech Partners, New York.

$$$

Anacomp, Inc. has signed a seven-year credit agreement with five banks for a total of $45 million. The banks are Chase Manhattan Bank, N.A. (acting as Agent Bank); Manufacturers Hanover Trust Co.; Bank of America National Trust and Savings Association; Lloyds Bank of California; and American Fletcher National Bank and Trust Co.

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Advanced Micro Devices reported sales of $91.5 million for its third quarter, 1982, a 30% increase over the same period the previous year. Net income for the first nine months of the year resulted in earnings of 54 cents per share for stockholders, compared with nine-month earnings the previous year of 24 cents per share.

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Rosscorp Corp., Cerritos, Calif., has secured $3 million in first-round funding from a consortium of venture capital firms led by Vista Ventures, Stamford, Conn. Other investors include Burr, Eagan and Deleage, San Francisco; Brentwood Associates, Los Angeles; and Whitehead Associates, Greenwich, Conn.

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Drivetec, Inc., San Jose, Calif., has secured $3 million of equity funding. Investors include Hambro International Venture Fund, New York; Advanced Technology Ventures, Menlo Park, Calif.; and Bay Partners, Mountain View, Calif.

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Micom Systems, Inc. has reported a 51% increase in sales and earnings for the third period of fiscal 1982 over the corresponding period for the previous year.

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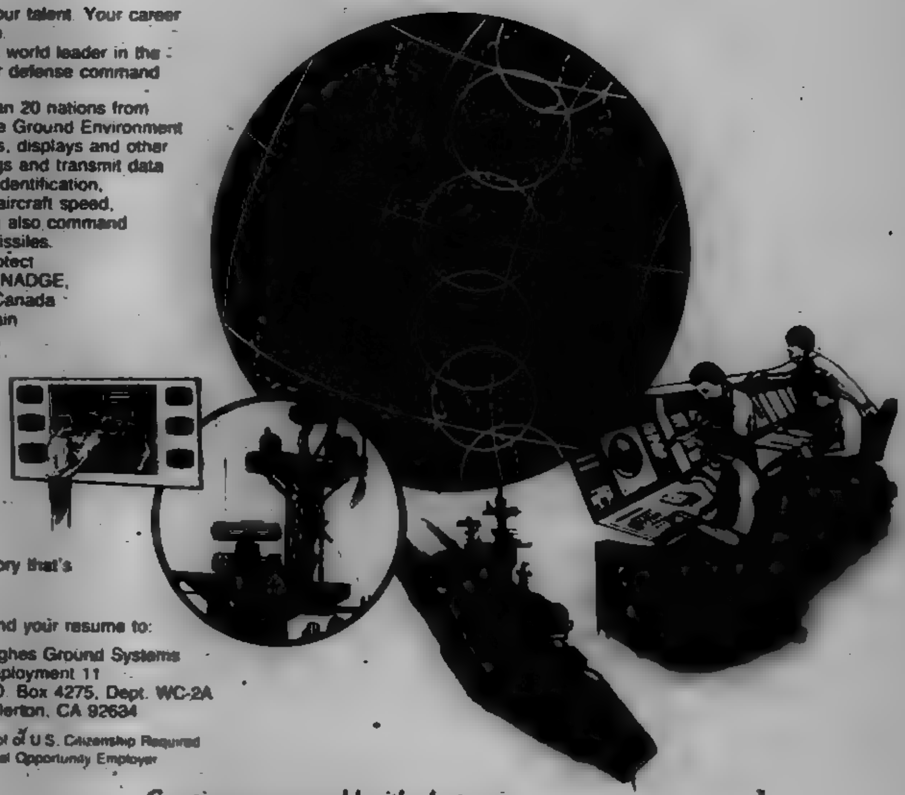

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PROGRAMMERS

Permanent & contract openings on C Fl's E coast for prog/anal & sys anal with 3-5 yrs exp in lg IBM or insurance. DMS & CICS a big plus. Salaries depend on position & exp. Will provide housing if necessary.

PROG/ANAL

Prestigious consulting firm needs CICS & IMS experts. Excellent growth potential & benefits. Multiple openings.
To $35,000

Pam Evans
ROBERT HALF
of Orlando
2699 Lee Road, Suite 415
P.O. Box 17892
Orlando, FL 32860
(305) 628-2836

SOUTHERN CALIFORNIA

LOS ANGELES

SYSTEMS PROGRAMMERS

Multiple firms have immediate needs for experienced Systems Programmers! Disciplines include MVS, IMS or CICS. Don't wait, call or send resume today!
$30 to 50,000

Joe Reese
ROBERT HALF
of Los Angeles, Inc.
3600 Wilshire, #2000
Los Angeles, CA 90010
(213) [illegible]

ORANGE COUNTY

EDP AUDITORS

Multiple positions exist in Orange County for auditors with a Data Processing background. A degree is required and large scale IBM experience desirable. To $34,000

Dean Slone
ROBERT HALF
of Orange County
2233 N. Broadway, Ste. 200
Santa Ana, CA 92706
(714) 835-4103

NEW YORK

VAX
BASIC +2

A prestige position is available with the leasing arm of one of the world's largest fin'l organizations. Qualified candidates should have 2+ yrs programming on VAX equipment utilizing RSTS/RSX and BASIC +2. This fast-track Wall Street situation offers superb benefits & promotability. Fee Paid.
$28,000

SR EDP AUDITORS

Two outstanding EDP audit positions are available with one of the country's largest commercial banks. 2+ yrs EDP audit exposure opens the door. One position will work out of the Data Center with responsibility for post-implementation & review. The other is responsible for pre-implementation. Ideal candidate will have blend of auditing & tech skills. Fee Paid. $40,000

ROBERT HALF
of New York
522 Fifth Avenue
New York, NY 10036
(212) 221-6500

TENNESSEE

SR PROGRAMMER ANALYST

Mgmt potential in this expanding DP department. 3-4 years COBOL, CICS, and DL/1 experience needed in a mfg environment. Young, aggressive company experiencing 30-40% growth. High $20's

TECHNICAL SUPPORT

Several openings for 2+ years experience in IBM DOS/VSE, OS/VS 1, VM, and Honeywell GCOS shops. Stable companies in the middle Tennessee area.

BANKING

Growing financial institutions need all levels of data processing professionals. Must have COBOL experience in an OS environment. CICS+ Banking or financial background preferred. DOE

ROBERT HALF
of Nashville
1101 Kermit Dr., Suite 407
Nashville, TN 37217
(615) 361-4900

CHICAGO

SYSTEMS ANALYST

Systems Analyst for financial applications. Must have 2+ years OS, COBOL, & CICS. Exciting growth opportunity. Company paid benefits including dental. $30,000

Ed Byrnes
ROBERT HALF
of Chicago, Inc.
35 E. Wacker
Chicago, IL 60601
(312) 782-6930

WASHINGTON

SYSTEMS DESIGNER
DEC

Prestigious DC non-profit requires an experienced pro to set up corporate data base. Must know VAX and be a good communicator. $32,000

ROBERT HALF
of Washington
7316 Wisconsin Ave.
Suite 401
Washington, DC 20016
(301) 652-1960

KANSAS CITY

DATA BASE ANALYST
IMS

Expansion position for this major IMS installation creates the need for a senior Data Base Analyst. Prior IMS experience required with ability to layout data base architecture. Lead group of 3 junior DBA's on major expansion project. Excellent fringe benefits.
Salary to $38,000

SOFTWARE MVS

Midwestern MVS shop seeks expansion to their staff. Position requires 1 year MVS support or two plus years OS/VS support with either TCAM or VTAM experience. This excellent firm offers liberal benefits, continuing technical education, and an exciting opportunity. Salary to $37,000

George Waterman
ROBERT HALF
of Kansas City
127 W. 10th St.
Kansas City, MO 64105
(816) 474-4583

SAN FRANCISCO

Current needs are:
EDP Audit, IDMS Data Base, MVS Systems, Senior IMS DBA, IMS Internals, PL/1 Project Managers, CICS Command.

Bob Couch
Jerry Anderson
ROBERT HALF
of Northern California, Inc.
111 Pine Street, 15th Floor
San Francisco, CA 94111
(415) 434-1900

PHOENIX

SYSTEM PROGRAMMERS

Several large Phoenix corporations have retained us to recruit for their systems programmer positions. You can take your pick of industry environments. CICS, MVS, IMS, DB/DC, SNA/SDLC, ACF/MCP/VTAM opportunities available. Salary to $40,000

Ed Caron
ROBERT HALF
of Phoenix, Inc.
3660 N. Central, #1504
Phoenix, AZ 85012
(602) 264-6488

ALBUQUERQUE

SENIOR ANALYST

Large-scale IBM shop, COBOL and CICS. Develop new financial applications. Excellent growth potential.
Start $30,000

SYSTEMS PROGRAMMER

Requires 3+ years OS/VS1 support exp and SMP technical knowledge. JCL and ALC. Excellent fringe benefits.
Start $36,000

Dick Starnes
ROBERT HALF
of New Mexico
P.O. Box 3320
Albuquerque, NM 87190
(505) 884-4557

SEATTLE

SR DATA BASE ANALYST

Seattle firm seeks senior data base analyst with 5-7 yrs in IBM OS/MVS IMS DB or DL/1 environment. To $37,000

SYSTEMS PROGRAMMER
ALASKA

Anchorage firm seeks systems programmer with 4-6 years experience in IBM OS/MVS environment. To $43,000

Marjie Peterson
ROBERT HALF
of Seattle, Inc.
600 University St., Suite 2328
Seattle, WA 98101
(206) 624-9000

ST. LOUIS

CAD/CAM SPECIALISTS

Major St. Louis based manufacturer has embarked on a major CAD/CAM development effort. Position requires at least 1 year of experience with CAD/CAM, and/or Artificial Intelligence systems development. Also requires BS in Computer Science. Several excellent Fee Paid positions.
Salary $25-40,000

COBOL PROGRAMMER/ANALYST

Large division of a successful manufacturer seeks an experienced COBOL P/A with experience in CICS, DL/1 and COPICS. Position requires 3-5 years experience in a manufacturing firm. Position will develop into DP Manager in 2 years. Excellent relocation package. Fee Paid. Salary $28,000

MGR DATA BASE ADMINISTRATION

Fortune 200 manufacturing firm seeks an individual to set up and run Data Base Administration. Requires BS degree, 10 years DP, and 5 years DB experience. This is a ground floor-high visibility opportunity. Excellent benefit package. Fee Paid. Salary $35,000

SR SYSTEMS PROGRAMMER

Expanding financial institution seeks an experienced MVS Sr Systems Programmer to take charge of a new installation. Must be strong in data communication and currently involved in software and hardware selection. Requires 4 years experience with OS/VS1 or MVS. Good benefits-high visibility. Fee Paid.
Salary $33,000

Randy Pace
ROBERT HALF
of St. Louis
7733 Forsyth Blvd.
St. Louis, MO 63105
(314) 727-1535

BOSTON

IMS TECH SUPPORT

Top calibre internals spec sought by leading consumer goods org. IBM OS/MVS, IMS DB/DC environ w/outstanding tech staff. Will eval h/s, perf eval & capacity planning. Reloc & interv exp pd. $33,000

OS SYS PROGRAMMER

Growing MIS org seeks systematic internals spec for lead role. Dual OS/MVS mainframes using IMS, MVS/SP, CICS. Oppty to do SYSGENS, SMP maint, tuning & software install. Reloc & interv exp pd.
$33,000

SYS/38 - MAINE

Profitable mfg div of nat'l org seeks progressive RPG II P/A w/strong analytical skills. Will design, code & install distribution & mfg sys at remote sites. Outstanding oppty for the dynamic, well organized pro. Reloc & interv exp pd.
$28,000

Gerry Battista
ROBERT HALF
of Boston, Inc.
100 Summer Street
Boston, MA 02110
(617) 423-1200

PROVIDENCE

SOFTWARE DEVELOPMENT

Exclusive RH client seeks sys consultants for IBM S/34-38 MAPICS & DMAS devel. Top-notch hi-visibility pos req both excellent user skills & tech exp in communications, data base, RPG II/III, SDA, WSU, CL & DFU. Prestigious growth oriented firm with nat'l mktplace.
$33,000

ROBERT HALF
of Providence, Inc.
400 Turks Head Building
Providence, RI 02903
(401) 274-8700

FT. LAUDERDALE

SYSTEMS PROGRAMMER

Established, nationwide company is seeking a DP professional with at least 4 years experience in the following: DEC PDP-11, MACRO II and RSX 11S operating system. It would be helpful if this individual had some communication protocol experience. Exceptional opportunity.
Salary to $32,000

ROBERT HALF
of Fort Lauderdale
7770 W. Oakland Pk. Blvd.
Suite 410
Ft. Lauderdale, FL 33321
(305) 742-0200

MINNEAPOLIS ST. PAUL

VP/MIS

New advancement oppty for fast-tracking DP professional to assume control of large ops, TEX support & S&P staff. Req's mgmt exp at bank or similar fin'l institution.
Salary to $65,000

Mark David
Bill Thompson
ROBERT HALF
of Minnesota, Inc.
2236 IDS Center
Minneapolis, MN 55402
(612) 339-9001

HARTFORD

PROJECT MANAGERS

Ins professionals. Exciting oppty's for indiv w/6-8 yrs DP, lge IBM bkgrd, structured analysis, supvry exp to manage new devel projs. Bkgrd in life, group & pensions a plus.
$40,000

SR SYS ANALYSTS

Conn fin'l svcs oppty's for invest. securities bkgrd w/IBM, COBOL, structured designs techniques. Must be promotable.
$35,000

DATA BASE

IMS DB/DC bkgrd w/proj respons in new apps urgently needed with growth co. $35,000+

Stan Durbas
Burt Israel
ROBERT HALF
of Hartford, Inc.
111 Pearl Street
Hartford, CT 06103
(203) 278-7170

SAN ANTONIO

IMS ANALYST–
PROJ LDR–MGR

Degree preferred. Any and all IMS personnel. Salary is DOE. Excellent visibility, growth and future $ potential. Any bkgd or appl environment. Co is stable & expanding, not replacing.
$30-60,000

ASST DP MGR

Degree required. 4+ yrs exp with RPGII, small IBM systems a MUST. Supervisory exposure a PLUS. Position is visible and Mgr slot available w/in 2 yrs.
$25,000 + Bonus

PROJECT MGR

Degree required. 10+ yrs in DP with 3+ yrs in Proj Mgr or Ldr position a MUST. Large scale environment with latest state-of-the-art requirements. Need to be aggressive and capable of overseeing "total project picture." Benefits, salary, growth unlimited.
$35-46,000

PROJECT MGR

Degree required. 7+ yrs DP with at least 2 yrs in project supv ldr, mgr role. Burroughs shop, HP3xxx interface in COBOL. Manage staff in newspaper circulation environment. Position is in Central TX and reports to top mgmt. Excellent benefits. $40,000

All positions above and many more are in Texas, where "Long Necks," "Armadillos" and the "Cotton Eyed Joe" call home.

Bob Baldauf
ROBERT HALF
of San Antonio, Inc.
8243 I H 10 West, Suite 880
San Antonio, TX 78201
1-800-531-5402
In TX dial (512) 736-2467

AUSTIN

DATA BASE ADMINISTRATOR

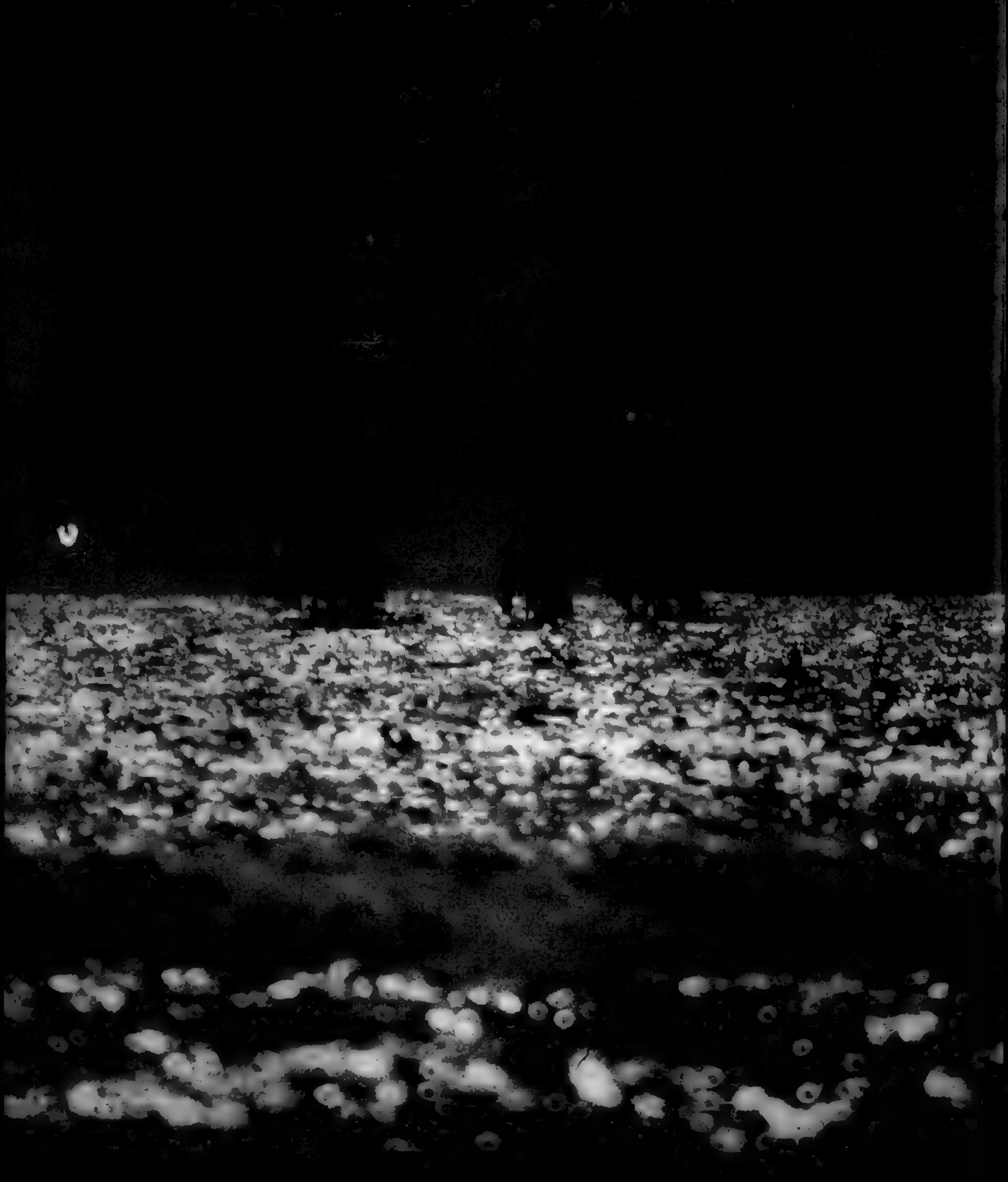
BS degree. Must have IMS DB/DC. DB design exp. Must have project mgmt exp. Currently designing IMS version.
$38,000

SYSTEMS ANALYST

Degree required, 3+ yrs lg IBM, COBOL, IMS, DB/DC, CICS, Ins or fin'l apps.
$27,000

Tina J. Romano
ROBERT HALF
of Austin, Inc.
400 E. Anderson, #334
Austin, TX 78752
(512) 835-0063

Would you like to live and work on the West Coast?



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$20,000-$60,000 +

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If you've ever thought seriously about living on the West Coast, Source Edp now offers you a golden opportunity to explore the possibility.

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Gary Weiss
Source Edp, Dept. C-1
West Coast Region
Headquarters
P.O. Box 7100
Mountain View, CA 94035

(When writing, please include your position title.)

source edp
Personnel Services

Washington, Alaska

Data Base Analyst — Ground Floor Position. Well-established international software vendor is expanding its staff to include the company's first data base analyst. Successful candidate will possess expertise in a major data base management system such as IMS, TOTAL or IDMS. Microcomputer exposure helpful. To $38,000.

IBM Programmer/Analyst — IMS Training. Leading Seattle-based Fortune 500 financial organization offers the best in-house training in Seattle and a pleasant, modern working environment. Position requires OS COBOL experience. Relocation assistance provided. To $28,000.

Microcomputer Consultant — High Visibility. An outstanding opportunity to start-up and manage a new micro-services center. The ideal candidate will know business systems, BASIC, microcomputers and their software products. Will initially do it all — consult, teach, program, and give seminars. Bachelor's degree required. To $28,000.

Micro Systems Software — Industry Leader. Rapidly growing Seattle-based software development organization has several openings for micro systems software specialists. Position involves design and development of leading edge products such as compilers and operating systems for major microcomputers. To $34,000.

Information Systems Expansion — Multiple Openings. Eastern Washington computer services firm is in the process of expanding its corporate data center. It seeks professionals in a variety of disciplines including Scientific Programmer/Analysts, Minicomputer Programmer Analysts and Data Communication Analysts. State-of-the-art environment includes real-time and interactive computing. To $35,000.

Consultant — Systems. Seattle office of a Big 8 CPA firm seeks a professional capable of directing its systems consulting activities. Exposure to a broad variety of commercial applications desired. Degree required. To $40,000.

Minicomputer Programmer/Analyst — Four Day Work Week. Progressive employee-oriented firm offers excellent benefits (including profit sharing and four day work week), and exposure to manufacturing systems. Successful candidate will have BASIC experience on minicomputers. Manufacturing applications and DEC PDP-11 or VAX helpful. To $26,000.

Director of Software Development — Ground Floor Opportunity. Join an up-and-coming microcomputer software development firm headquartered in the Pacific Northwest. A track record managing the development of micro based systems is required. The company is well financed and Stock Options are available. This is an exciting opportunity for an aggressive, entrepreneurial-minded professional. To $50,000.

Software Engineers — Many Opportunities. Highly-regarded Pacific Northwest organization has several real-time ASSEMBLER and FORTRAN software development projects to staff. Graphics, SCADA, VAX, SEL, CDC and/or microcomputer skills are preferred. Bachelor's degree required. To $40,000.

Programmer/Analyst — Management & CICS Training. Rapidly expanding Western Washington data processing organization seeks a professional having at least two years of IBM OS/COBOL and VSAM experience to work on financial information systems. Continued expansion provides excellent opportunities for upward mobility. To $30,000.

Systems Programmer — Alaska. Expanding Alaska firm offers state-of-the-art exposure to an experienced IBM OS Systems Programmer. The successful candidate will join the state industry leader while enjoying the unique advantages of our 49th State. CICS, MVS/JES systems, internals desirable. To $48,000.

Oregon

Sales Representative — Computer Manufacturer. Portland branch of very aggressive and expanding national minicomputer manufacturer seeks individual with 2-3 years successful track record in sales of computer hardware and/or software and with ability to work with top level management and decision makers. Will market complete product line including data processing and word processing systems to a wide variety of industries. To $60,000.

Programmer Analyst — Learn New Skills. New development with opportunity to learn IMS/DL1. Expanding department of strong Portland firm needs individual with minimum two years experience with CICS (Command Level) and COBOL. Will be key member of small project team and will have opportunity to learn IMS/DL1 on next project. Career growth opportunity. To $25,000.

Senior Programmer Analyst — State-of-the-art. Portland financial institution has new expansion position for a self-starter who has over four years strong COBOL and a minimum of one year experience with IMS data base. First project in this very progressive and state-of-the-art environment is as team member to implement a new Deposit System. Any exposure to on-line is a real plus. To $30,000.

Software Engineer(s) — Microprocessor(s). Newly-formed division of Portland firm that specializes in high reliability systems to support the industrial control/process control industry has urgent need for Software Engineer to develop application software. Desire individuals with good knowledge and experience with software development communications, I/O drivers and Operating Systems on microprocessors. Dynamic, young company. To $38,000 + stock options.

Software Engineer — Operating Systems Designer. Exciting young firm in Portland offers unique opportunity to develop sophisticated microprocessor operating systems software. Position involves leading several junior engineers in designing and developing operating systems for high reliability/redundant industrial control applications utilizing microprocessors. A strong background in operating systems development on microprocessors is required. To $45,000.

Systems Programmer — Micros and Unix O/S. Excellent opportunity for individual with heavy background with the Unix operating system and microprocessor software to develop and enhance in-house developed operating system to support intelligent communication terminals and word processing systems. Oregon company emphasizes research and development of new products to support both products. Growth-oriented firm. To $40,000.

DB Analyst — Growth to Administrator. Young and rapidly growing Portland firm has requirement for individual to support IDMS data base activities. Duties will include physical and logical data base design, applications development consulting, data base maintenance, data base tuning, user training, etc. Excellent opportunity for growth to the DB administrator's position. To $34,000.

Senior Network Systems Programmer — Will Lead to Management. Growth opportunity in state-of-the-art Portland shop for individual to be integral part of team responsible for total corporate network (includes international). Requires solid background with IBM Networks (VTAM, NCP, NCCF, NPDA, etc.) with exposure to other protocols a real plus. Desire individual who is a good problem solver. Opportunity for management. To $37,000.

Programmer/Analyst — Minicomputers. New development group has recently created expansion positions for several enthusiastic Programmer Analysts with solid background in BASIC language and the PICK operating system. Will develop new on-line applications for Order Entry and Inventory on minicomputers and then will support field installation of these systems. Company provides a very creative environment in Portland. To $28,000.

Senior Systems Analyst — Manufacturing Systems. Unique opportunity to function as a project leader on the design and development of new on-line and data based manufacturing/engineering systems. Seek an individual with good IMS design and development background and previous project leadership experience. Excellent career growth opportunity for an individual to grow into first level management. To $33,000.

Systems Programmer — CICS Specialist. Join this aggressive Portland firm's staff of technical support specialists and be responsible for the majority of CICS system programming activities. Will also be involved in MVS maintenance and enhancement and will be given opportunity for additional work and training in supporting DL/1, Performance monitoring, Capacity planning, etc. Requires solid experience with MVS and CICS systems programming activities. To $38,000.

Northern California

Systems Programmer — Superb Location. National financial computer service company is looking for an experienced OS/MVS Systems Programmer to support their growing IBM 3033 facility in the beautiful San Joaquin Valley. To $40,000.

Telecommunications Specialist. Join a rapidly expanding national computer network using Tandem front end processors and IBM hosts. Experience required with IBM SDLC and Tandem TAL. To $40,000.

Manager of Network Architecture. Nationally-known San Francisco Bay area based firm with extensive TP network. Responsible for network planning, installation, and support from controllers out. Must have large IBM experience. To $60,000.

Systems Programmer. Leading San Francisco based firm seeks a proven OS/MVS Systems Programmer experienced with MVS Internals, Tuning, and Capacity Planning. To $38,000.

Internal Consultant — IDMS. Progressive Bay area firm located in a highly desirable suburb seeks a proven Systems Analyst with an extensive background in Systems Development using IDMS. To $40,000.

Project Leader — New Development. Major San Francisco financial institution seeks a proven Programmer/Analyst to lead the development of an Electronic Funds Transfer System in an IBM/OS environment using CICS. To $39,000.

Data Base Administrator — Prestigious Firm. Silicon Valley manufacturer offers an excellent opportunity for an experienced IMS Data Base Administrator familiar with the Data Communication facility. To $43,000.

Systems Analyst — Large System Environment. National consumer electronics firm seeks a proven Systems Analyst with strong manufacturing and accounting experience in a large IBM/OS environment. To $36,000.

National Sales Director. International firm located in San Francisco seeks proven Software salesperson to introduce new relational data base package and establish national accounts. Compensation will be structured to the individual. To $80,000.

Software Manager — Major Responsibility. San Francisco area division of Fortune 500 Corporation seeks enthusiastic leader of real-time interactive Software group. Technical degree and at least 10 years of progressive development responsibility sought. To $50,000.

Project Leader — Southern Peninsula. Senior level software engineer to lead mini/micro operating systems development team for new 32 bit processor. Requires 5 years software development with specific operating systems experience. Salary to $55,000 and equity potential.

Software Engineer — Fast Growth. Leading San Jose-area growth company seeks Microprocessor software professional to develop systems for the Communications industry. Experience with Assembler and PASCAL. To $45,000.

Southern California

New Corporate Data Center — Orange County. Fortune 500 organization is undergoing a major expansion and is in the process of centralizing all systems planning, programming software and computer operations into a new corporate data center. The center, which is located in a highly desirable suburban Orange County area, will house the latest in IBM computer hardware and software technology including advanced data base telecommunications and distributed processing applications. Current openings include Programmer/Analyst, Systems Analysts, Project Managers, EDP Auditors, System Programmers and Hardware/Software Planners. Starting salaries range to $35,000.

MI Director — New Data Center. Progressive firm in the electronics industry seeks a proven Manager capable of building a data processing organization from the ground floor. Will select equipment, hire staff and set direction for successful and growing firm. Suburban Los Angeles community. To $45,000.

EDP Audit Specialist — Extensive In-House Training. Fortune 500 organization headquartered in Southern California seeks an EDP Audit Specialist experienced in designing accounting applications in an IBM OS environment. Training in auditing techniques and advanced computing provided. To $30,000.

Sales Representative — High Income. Orange County office of a leading computer manufacturer is seeking a Marketing Representative with a proven track record of selling business systems. The average income of its sales force last year was over $58,000.

Programmer/Analyst — Learn Data Base. Growing Los Angeles energy company seeks OS/COBOL Programmers who want to learn IMS and manufacturing applications. Presently developing new IMS systems for plant and building maintenance and shop floor scheduling. To $35,000.

Software Development — Minicomputers. Successful Orange County minicomputer manufacturer seeks professionals with operating system computer data communications, data base or microprogramming experience. Company is committed to developing and sustaining a complete line of state-of-the-art systems software products. To $40,000.

COBOL Programmer — Newport Beach. Well-known diversified financial services firm seeks a professional with a minimum one year COBOL programming experience. Outstanding work environment overlooking Pacific Ocean. CICS, MVS training provided. To $30,000.

Programmer/Analysts — San Fernando Valley. Major financial institution located in a desirable suburban setting north of Los Angeles needs both mini and large systems Programmer/Analysts. The organization provides excellent benefits including an exceptional benefits package. To $34,000.

FORTRAN Programmer — Business Systems. Fast-growing Los Angeles suburban financial firm seeks a professional with FORTRAN experience. Company is installing dual computers for on-line transaction-driven systems. To $32,000.

On-Line Project Leader. Reorganization of an established data processing group provides a major growth opportunity for a current Senior Analyst. Excellent location, near ocean and Los Angeles airport. Will direct 2 to 5 Analysts in the installation of a major on-line manufacturing system using IMS DB/DC. To $36,000.

Minicomputer Programmers — World-Wide Network. Prestigious organization near Santa Monica beach seeks experienced on-line real-time Minicomputer Programmers to participate in the development of a world-wide financial communication network. To $40,000.

Consultants — Big "8" Prestige. Los Angeles practice of a major Big 8 firm is committed to significant expansion in 1983. Excellent opportunities for senior level professionals with background in manufacturing, financial or administrative systems. To $50,000.

Minicomputer Programmer — San Diego Suburb. Division of a Fortune 500 corporation seeks a Programmer Analyst proficient in any high-level language (e.g., FORTRAN, PL/1, ALGOL, or PASCAL) to work on a variety of minicomputers (including PDP-11 and HP computers). To $32,000.

On-Line Programmers — OS Environment. Major San Diego based organization has several openings for On-Line Programmers to participate in a system utilizing a large network of terminals tied to two of IBM's latest computers. Selected candidates will work in an OS/MVS CICS IMS environment. To $35,000.

Senior Minicomputer Systems Programmer. Manufacturing company headquartered in San Diego has a requirement for an experienced PDP-11 Programmer who has worked on RSX-11M. Will be involved in a major effort to develop a state-of-the-art real-time system. To $32,000.

Graphics Programmer/Analysts. One of San Diego's premier graphics software firms has several positions available for individuals with a background in FORTRAN. To $32,000.

MVS Systems Programmer. Large San Diego based organization seeks a professional to assist in the upgrade to MVS utilizing multi-CPU's and a large network of terminals. The company is one of the most stable organizations in the San Diego area, yet one of the most progressive in keeping up with state-of-the-art technology. To $36,000.

Multiple Career Path Opportunities. Major San Diego high technology organization with multiple large-scale computer systems, minicomputers and microprocessors is currently expanding its professional data processing staff due to projected business growth. Current requirements include Business and Scientific Applications Programmers with a proficiency in COBOL, ALC or FORTRAN; Systems Programmers with experience in OS/VS2/MVS, IMS or telecommunications, and Business and Scientific Systems Analysts to develop new systems utilizing structured design and IMS. Salaries range from $30,000 to $35,000.

IBM Systems Programmer — Customer Support. A national computer manufacturer is seeking several additional Systems Programmers to staff their growing San Diego facility. Individuals with experience in IBM DOS or OS operating systems preferred. To $35,000.

Financial Systems Analyst. Rapidly expanding financial institution is seeking a computer professional with solid systems analysis ability who has served as a Project Leader. Experience in on-line systems in IBM COBOL and Assembler environment is highly preferable. Facility is located in one of the most beautiful sections of San Diego. To $30,000.

RPG II Programmer — Learn RPG III. International transportation company seeks an experienced RPG II Programmer. Will gain experience in RPG III on a S/38. To $25,000.

Micro Programmer Analysts — Leading Firm. San Diego based company, a leader in its field, needs Assembly Language Programmers to work in video graphics, real time software and software utility development. To $38,000.

PASCAL Programmer/Analyst — Process Control. Opportunity for experienced PASCAL Programmer to work on real-time process control applications for software development firm in San Diego. To $33,000.

Communications Specialist — Multiple Openings. San Diego office of national consulting firm needs experienced software people to work on secure communications systems. To $40,000.

Data Processing

MANAGEMENT INFORMATION SYSTEMS OPPORTUNITIES

Anheuser-Busch Companies, the nation's #1 name in beer, is seeking experienced individuals for it's Management Systems Department located in the corporate headquarters based in St. Louis, Missouri.

MANAGEMENT RESEARCH ANALYST

Duties will include participation in a variety of projects to design, program and implement enhancements to existing management science-based systems. You will also research the feasibility of new or advanced O/R-based techniques for specific departments where present applications are limited. The opportunity to develop new O/R-based analytical and decision support systems also exists.

The ideal candidate will possess a technical or engineering degree. An MBA, with emphasis in the management sciences — including linear programming, simulation and statistics/regression analysis is required. Applicants will have several years' experience in an industrial setting developing and implementing systems based on management science techniques.

SYSTEMS ANALYST

Duties will include in-depth involvement in the analysis, development and implementation of computerized solutions for company business issues. The Systems Analyst will develop, analyze and design reports, detail a system work plan, implement the system solution under the direction of the project manager. You will be working with various department managers, so good written and verbal communications skills are a must.

The ideal applicant will possess a BS degree in Data Processing or Business, MBA preferred. Candidates will have 1-2 years' experience in system design, prior programming experience with 2-4 years' exposure to Data Processing with 1 year of emphasis in systems analysis.

We offer an excellent salary and a complete company paid benefits program including dental plan. Interested and qualified applicants, please send your resume, educational and salary history in confidence to ANHEUSER-BUSCH COMPANIES, Corporate Employment; Department G-31-LB-CW; One Busch Place; St. Louis, Missouri 63118. An Equal Opportunity Employer M/F.

ANHEUSER-BUSCH COMPANIES

SAUDI ARABIA

SYSOREX INTERNATIONAL, a California Corporation and a rapidly growing systems management company now developing innovative multi-technology systems in Saudi Arabia has an opening for:

Training Manager
(Riyadh, Saudi Arabia)

To manage team of trainers including curriculum development and instructional technology for on-the-job training in computerized information systems. Responsible for planning and implementation of all training tasks. Min. 5 yrs experience managing EDP training program with strong preference for international training experience. Arabic language ability and previous Saudi Arabia experience desirable. Advanced degree preferred..

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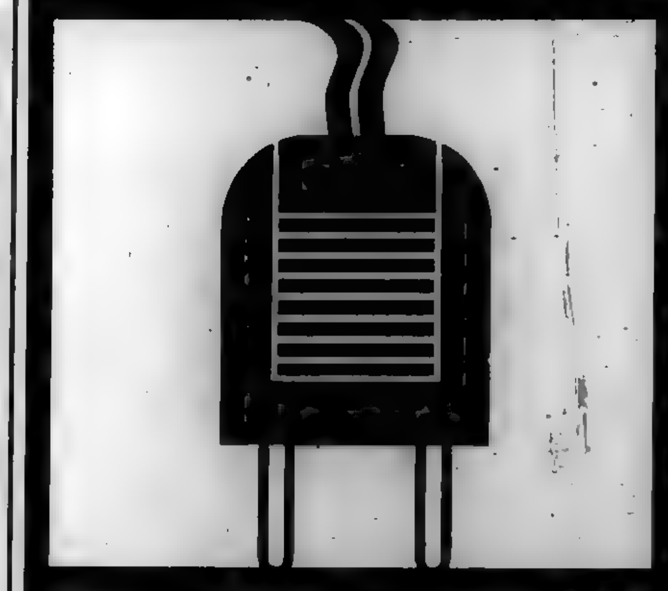

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Design & Develop computer systems and sub-systems including CRT controller for video terminals & floppy disk controllers. Design tape memory systems using dynamic RAMS & peripheral interfaces to standard microcomputer bus like MULTIBUS & UNIBUS. Design firmware for microprocessor based systems; test & debug systems. Design automated testing equipment for testing microprocessor based circuit boards. Need Bachelor's degree or Equivalent in Electronics and Communications Engineering plus 4 years experience in the job. 40 hrs./wk. $2416/mth. Apply at Texas Employment Commission, Bryan, Texas, or send resume to Texas Employment Commission, TEC Building, Austin, Texas, 78778, J.O.# 3098135. Ad paid by Equal Opportunity Employer.

Sales Engineer

Cook Electric Division, Northern Telecom Inc. has contributed 84 years of dedicated service to the telephone industry. We manufacture microprocessor based and minicomputer oriented data acquisition systems for independent telephone operating companies.

We are looking for a dynamic sales person to become involved in the sale of systems and sub-systems. Responsibilities include preparation of and providing seminars/presentations and generation of formal proposals.

Position requires 5+ years experience in telephony or computer sales with the ability to interface with all levels of telephone operating company personnel. We offer the qualified candidate excellent compensation and a full corporate benefit package.

For immediate consideration, please send your resume to:

Barbara Conn, Staffing Specialist
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If you have the highest regard for your profession, then join a company that shares your enthusiasm for personal and professional development. As additional incentive, we offer competitive salaries and a truly outstanding benefits package, including medical, dental (including orthodontia), vision care and educational assistance.

We recognize that you may not have an updated resume, so kindly drop a brief note indicating your experience and requirements to: Human Resources, Department 302, Wakefern Food Corporation, 600 York Street, Elizabeth, NJ 07207. We are an equal opportunity employer M/F.

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Data Processing

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This position requires a degree or equivalent experience, plus a minimum of two years COBOL 74 programming. We prefer Honeywell level 66/DPS, experience with DM IV, IDS II, transaction processing and TSS.

If you are interested in joining the over 900 people who call Current, Inc. their home, please forward your resume salary history and requirements in confidence to:

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A minimum of 5 years experience in digital computer programming with a minimum of 2 years spent directing others in programming functions and systems analysis. A BA or BS degree from an accredited institution. Library systems experience helpful. Functions as project leader on major library application development projects with minimal administrative supervision. Works under the direction of the library administration to establish project priorities and definitions with the Computer Center to design systems. Minimum salary: $25,000. Deadline for applications is March 9, 1983. Send resume to:

Mr. Bobby Holloway
Auburn University Libraries
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COMPUTER SCIENCE

Tenure-Track

Assistant/Associate Professor

Ph.D. in Computer Science or related field is preferred. Candidate with a Master's in Computer Science with appropriate industry experience will be considered. Previous teaching and/or industry experience are considered assets. Applicants should possess the ability to instruct in some of the following: Programming Languages (Assembler, BASIC, FORTRAN, PASCAL, PL/1), Compiler Techniques, Operating Systems, Software Design, Computer Architecture, Data Structures, and Artificial Intelligence. Position is for September 1983. Application deadline is March 14, 1983. Salary ($24-32,000) dependent upon qualifications. Send letter of application, transcripts, and three letters of recommendation to: Dr. Charles F. [illegible], Dean of the Faculty, Carroll College, Waukesha, WI 53186.

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A Transportation Group is seeking a Programmer/Analyst for designing and programming computer programs in the following areas: On-Line Material Control Systems, Job Control Systems, On-Line High Volume Distributed Data Capture, General Hourly Payroll Systems, Financial General Ledger Systems, Invoicing Systems; and Security Control for User Access for On-Line Systems. This position requires specific knowledge and experience in Trucking Industry Systems, COBOL, Command Level CICS, DL-1, TSO/SPF, IMS Data Base, OS/MVS, Color BMS Mapping, JCL and IBM-3032 Hardware.

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IBM DOS/VSE experience
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SYSTEMS ANALYST. Design & implement computer systems rltd to financial insts. Maintenance & enhancement of systems & provide vital skills ensuring their successful & cost effective operation. B.Sc. or equiv. in ComSci/DP/Math/Physics. Must have knowledge of COBOL, ASSEMBLER, & CICS. 2 yrs or 2 yrs programming. $538.50 per wk to work 40 hrs/5 days/wk. **PLEASE SEND RESUMES: Pinkerton Computer Consultants, Inc. 111 Broadway, NYC 10006**

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Design CPU boards, memory boards, disk controllers, printer controllers, and CRT controllers used in automation systems. Test and debug system. Design automated testing equipment and related software development. Design packaging for sub-systems and develop systems by use of S-100 bus backplane. Need Bachelor's degree or Equivalent in Electronics and Communications Engineering plus 4 years experience in the job. 40 hrs./wk. $2416/mth. Apply at Texas Employment Commission, Bryan, Texas, or send resume to Texas Employment Commission, TEC Building, Austin, Texas, 78778, J.O. # 3066138. Ad paid by Equal Opportunity Employer.

PYA/Monarch

PYA/Monarch, a division of Fortune 100 Consolidated Food Corporation, is the third largest food service distributor in the U.S. We supply food and non-food products and services to restaurants, cafeterias, caterers, hospitals, schools and colleges, hotels and motels, etc., from coast to coast. Our corporation has grown from sales of $470 million to sales that now exceed $1 billion since 1978. In 1982, sales growth equaled an astounding 25%.

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DIRECTOR SOFTWARE DEVELOPMENT

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To be considered, you must have:

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You will be managing and working on complex, highly efficient on-line information retrieval systems. Your previous experience should be involved with remote computing software or services as opposed to internal Data Processing or MIS systems. This position reports directly to the V.P. Systems and Operations. You will be working with a top management team that is totally committed to and directly involved with implementation of computer-based information systems and with state-of-the-art hardware, software and systems technology.

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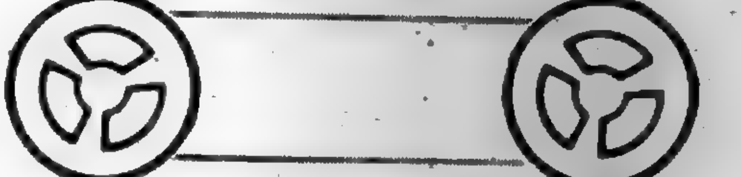

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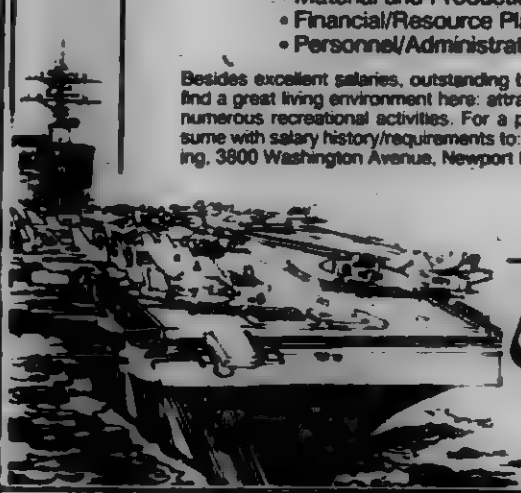

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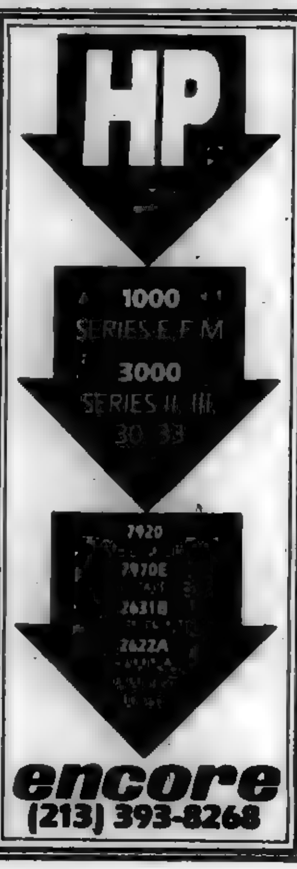

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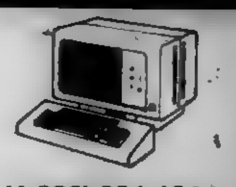

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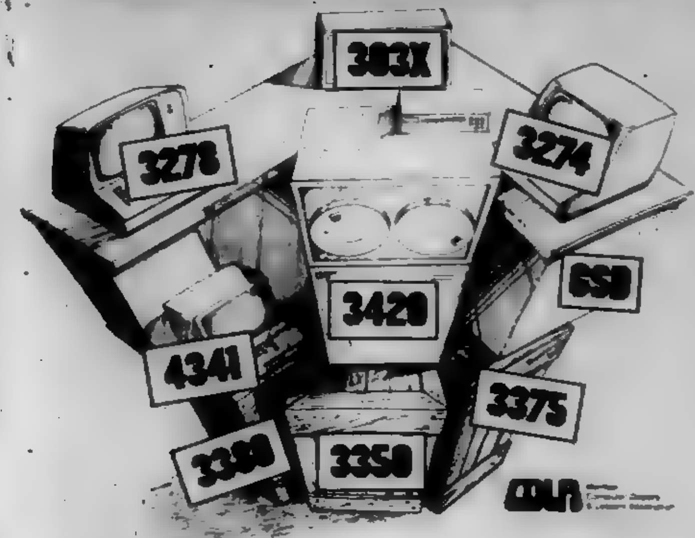

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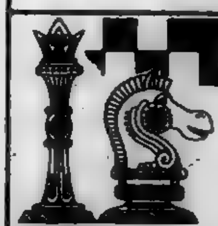

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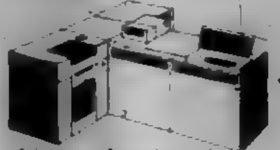

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ADVERTISERS INDEX

Advanced System Applications....27
Amdahl Communications....71
Amer-Cal, Inc....68
American Bell....20-21
Anchor Pad International....56
John Beall Company....77
CGA....19
Cincom Systems....37
Circle Computer Services, Inc....78
Circle Software Corp....84
Clapp & Poliak....15
Codex Corporation....18
Colad....43
ComDesign....46
Comp Ed....4
Computer Information Systems....50
Computer Management Research....88
Computerworld Buyers Guide....50
Computerworld Subscriptions....62
Computerworld Supplement....70
Comshare....42-43
Conference Management Group....86
Cord Cable Co....81
Corodale....90
CRWTH....47
CW on Communications....24
CW Office Automation....76
Cytrol....11
Dallas Market Center....13
Data Elektronik....54
Datapoint Corp....22
Datapro Research Co....85
Datasphere....90
Digital Equipment Corp/
—Accessories & Supplies....10
Digital Equipment Corp/
—Micros....40-41
Digital Equipment Corp/
—Networking....72-73
Digital Research....34
Drexel, Burnham, Lambert....36
E.E.C. Systems....84
Emery....66
Fidelity....46
Future Software....60-61
Gejac, Inc....22
General Systems....36
Graham Magnetics....65
Highlander Systems....78
Houston Instruments....26
H&W Computer Systems....12
IBM....74
IBM/ISG....48-49
ICCP....84
Infocentre....67
Innovation Data Processing....7
Interface Group....54
Invitational Computer Conference....56
Lee Data Corp....57
Library Journal....8
Macmillan Book Clubs....67
Management Science America....120
Mohawk Data Science....23,25,27
MPC....51
MTI Systems....58
Mike Murach & Associates....9
M.V. Associates....64
National Computer Corp....6
National Semiconductor....32-33
Omni Offices....89
Pace Applied Technology....31
Phaser....79
Popcom....58
PSW3, Inc....69
Racal Vadic....64
SAS Institute....39
SDI....57
Serena Consulting....66
Signal Technology....78
Software AG....71
Software Pursuits....13,15,17,19
Solutions, Inc....99
Sperry Univac....82-83
Storage Technology....52
Stratus Computer....17,87
Syncsort....3
Sysed....30,84
Teletype Corp....80-81
Televideo Systems....88-89
Texas Instruments....30
Tone Software Corp....30
Tower Systems....35
Tri-Data....14
Ungermann-Bass....55
United Technology....38
U.S. Postal Service....44
U.S. Robotics, Inc....11
Vertex Systems, Inc....49
Wadsworth Electronic Publishing Co....16
Walker Interactive Products....45
Xerox Corp....68-69
Yourdon....5

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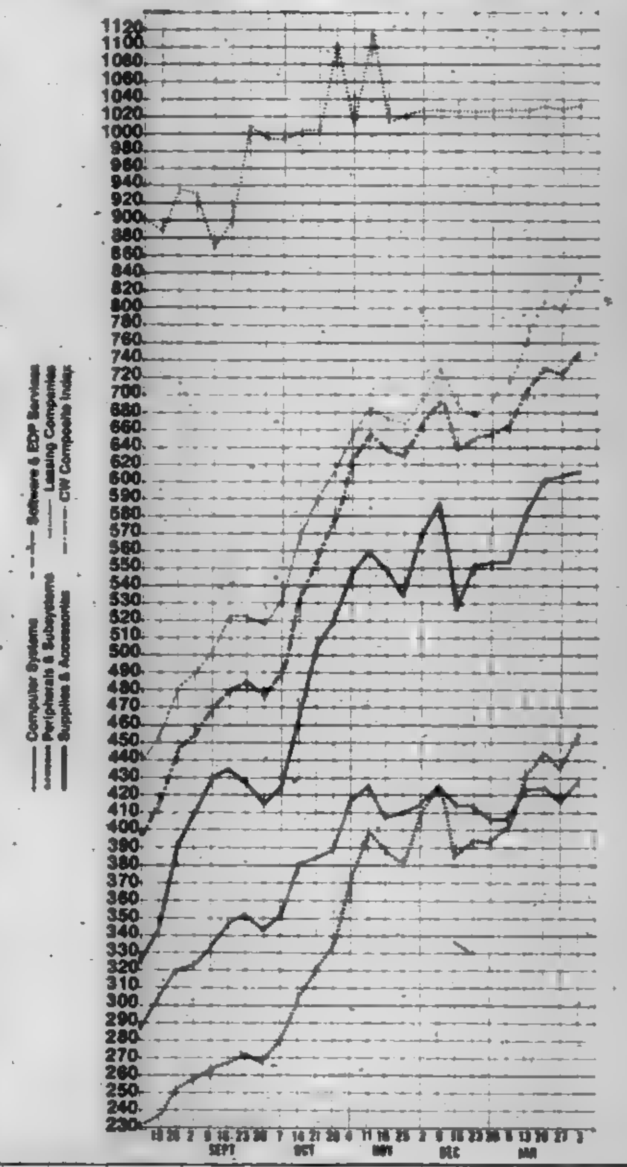

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, FEBRUARY 2, 1983

All statistics compiled, computed and formatted by TRADE QUOTES, INC. Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1982-83 RANGE (1)	CLOSE FEB 2 1983	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP	17- 36	36	+4 1/4	+13.3
N	BURROUGHS CORP	20- 48	43 1/4	-3 1/8	-6.7
O	COMPUTER AUTOMATION	7- 17	13 7/8	- 1/8	-0.8
N	CONTROL DATA CORP	21- 45	42 3/4	+ 7/8	+2.0
N	CRAY RESEARCH INC	20- 45	42 3/4	+2 1/4	+5.5
N	DATA GENERAL CORP	20- 58	48 7/8	+1 3/8	+3.0
N	DATAPOINT CORP	11- 54	20 3/4	- 1/2	-2.3
N	DIGITAL EQUIPMENT	62-122	118 1/4	+2 3/8	+2.0
A	EECO INC	6- 11	8 3/4	- 1/8	-1.2
N	ELECTRONIC ASSOC.	9- 12	10 1/8	- 1/4	-2.4
N	FLOATING POINT SYST	18- 35	32 7/8	- 3/8	-1.1
N	FOXBORO	22- 40	36 1/4	- 1/8	-0.3
O	FULCRUM COMP GRP	1- 3	1/4	0	0.0
O	GENERAL AUTOMATION	3- 6	6	+ 1/8	+2.1
N	HARRIS CORP	20- 43	40 7/8	+3	+7.8
N	HEWLETT-PACKARD CO	36- 82	78 5/8	+1 1/4	+1.6
N	HONEYWELL INC	60-104	87 3/4	-1	-1.1
N	IBM	48-100	96	+ 7/8	+0.9
O	IPL SYSTEMS INC	5- 9	6 3/4	- 1/4	-3.5
O	MAGNUSON COMP SYSTS	2- 16	2	- 5/8	-23.8
N	MANAGEMENT ASSIST	7- 18	15 3/8	+3 1/2	+28.4
O	MINI COMPUTER SYST	1- 3	5/8	0	0.0
N	MODULAR COMPUTER SYS	6- 13	11 7/8	+ 1/2	+4.3
N	MOHAWK DATA SCI.	10- 18	16 1/8	+ 1/2	+3.1
N	NCR	38- 95	93 1/2	+2 1/2	+2.7
N	PERKIN-ELMER	17- 33	31 3/8	+1 1/8	+3.7
N	PRIME COMPUTER INC	18- 42	40 3/4	+1	+2.5
N	SPERRY CORP	21- 38	37 1/2	+2	+5.6
O	TANDEM COMPUTERS INC	14- 34	28 1/2	+ 3/8	+1.3
N	TEXAS INSTRUMENTS	71-176	168 1/2	+6 3/4	+4.2
A	WANG LABS "B"	12- 35	32 1/8	- 1/2	-1.5
A	WANG LABS "C"	11- 34	32 1/8	- 7/8	-2.6

LEASING COMPANIES

EXCH		1982-83 RANGE (1)	CLOSE FEB 2 1983	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE FINANCIAL CP	22- 30	28 1/2	0	0.0
N	COMDISCO INC	13- 46	43 1/2	+ 1/4	+0.5
B	COMMERCE GROUP CORP	1- 1	1/4	0	0.0
O	COMPUTER INVSTRS GRP	1- 2	3/8	0	0.0
O	CONTINENTAL INFO SYS	5- 20	17 3/4	+1	+5.9
N	DPF INC	5- 13	10 5/8	0	0.0
O	ITEL	1- 3	3/4	+ 1/8	+20.0
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	18- 40	38 1/2	+1 3/4	+4.6

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EXCH		1982-83 RANGE (1)	CLOSE FEB 2 1983	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 6	3 1/2	+ 1/4	+7.6
O	ADVANCED SYSTEMS INC	9- 22	21 1/4	+ 1/4	+1.1
O	AGS COMPUTERS INC	7- 20	19 1/4	+ 3/4	+4.0
N	ANACOMP INC	9- 18	18	+ 1/4	+1.4
O	ANALYSTS INTL CORP	5- 9	8 1/2	+ 3/4	+9.6
A	APPLIED DATA RES.	16- 44	43 1/2	+3 1/2	+8.7
O	ASK COMPUTER SYSTEMS	12- 30	29 5/8	+4 7/8	+19.6
A	ASTRADYNE COMP IND	1- 5	3 7/8	+ 3/4	+24.0
N	AUTOMATIC DATA PROC	21- 38	33 1/2	-1 1/2	-4.3
O	CDA COMPUTER ASSOC	8- 12	11 1/4	0	0.0
O	COMPUTER ASSOC INT'L	12- 43	43 1/4	+3 3/4	+9.4
O	COMPUTER HORIZONS	1- 3	9 1/4	- 1/4	-2.6
O	COMPUTER NETWORK	4- 9	7 1/8	+ 3/8	+5.5
N	COMPUTER SCIENCES	11- 21	18 7/8	+2 5/8	+15.2
O	COMPUTER TASK GROUP	8- 18	15 1/4	+1 1/2	+10.9
O	COMPUTER USAGE	2- 10	8 1/4	- 1/2	-3.1
O	COMPUTONE SYSTEMS	13- 30	28	+2 1/2	+9.8
O	CONSERV CORP	11- 20	16	-1	-5.9
O	COMSHARE	6- 10	8 5/8	0	0.0
N	CULLINET SOFTWARE	12- 35	31 1/4	+ 1/4	+0.8
O	CYCARE SYSTEMS INC	9- 18	16	+1 1/4	+8.4
O	DATA DIMENSIONS INC	1- 3	1/4	0	0.0
O	DATATAB	0- 4	3/4	+ 1/8	+20.0
O	DYATRON CORP	2- 4	3 1/4	+ 1/4	+8.3
N	ELECTRONIC DATA SYST	18- 50	46 1/4	-1 1/8	-2.3
O	INFORMATICS INC	10- 29	25 1/4	+3	+13.4
O	INSYTE CORP	1- 3	2 3/8	+ 1/8	+5.5
O	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	4- 8	7	+ 1/4	+3.7
A	LOGICON	12- 31	29 7/8	+ 1/8	+0.4
O	MGMT SCI AMER INC	8- 28	27 1/4	+4	+17.2
O	MATHEMATICA INC	12- 20	18 1/2	+1	+5.7
O	MATHEMATICAL APP GRP	12- 18	18 1/2	0	0.0
O	NATIONAL DATA CORP	13- 28	18 3/8	+2	+11.9
O	PANSOPHIC SYSTEMS	8- 21	20 1/2	+ 1/4	+1.2
N	PLANNING RESEARCH	6- 13	12 1/2	+ 5/8	+5.2
O	PROGRAMMING & SYS	1- 4	3 7/8	+ 3/8	+10.7
O	REYNOLDS & REYNOLDS	17- 36	35 1/2	+1 1/4	+3.6
O	SEI CORP	21- 48	48 3/4	+8 1/4	+20.3
O	SHARED MEDICAL SYST	13- 28	28 3/8	+1 1/2	+5.8
O	SCIENTIFIC COMPUTERS	6- 13	11	+ 1/4	+2.3
O	SOFTWARE AG	5- 17	11 1/2	+1 1/4	+12.1
N	TYMSHARE INC	12- 30	20 3/8	- 7/8	-4.0
A	UPS CORP	10- 20	18 1/8	- 7/8	-4.6
N	WYLY CORP	7- 13	10	- 7/8	-8.0

PERIPHERALS & SUBSYSTEMS

EXCH		1982-83 RANGE (1)	CLOSE FEB 2 1983	WEEK NET CHNGE	WEEK PCT CHNGE
N	AM INTERNATIONAL	1- 15	2 5/8	+ 1/8	+7.5
A	ANDERSON JACOBSON	8- 23	22 1/4	+1 1/8	+5.3
O	AUTO-TROL TECHNOLOGY	8- 19	17 1/4	+2 1/8	+14.0
O	BANCTEC INC	7- 23	18 1/2	+1 1/2	+8.8
A	BEEHIVE INT'L	4- 10	9 3/4	+ 3/8	+4.0
A	BOLT,BERANEK & NEW	9- 35	34 5/8	0	0.0
O	CAMBEX CORP	2- 4	2	0	0.0
N	CENTRONICS DATA COMP	6- 17	17 1/8	+3 1/4	+23.4
A	CETEC CORP	4- 7	6 7/8	+ 3/4	+12.2
O	COGNITRONICS	2- 12	10 1/4	- 5/8	-5.7
O	COMPUTER COMMUN.	1- 2	3/4	0	0.0
A	COMPUTER CONSOLES	15- 44	41 1/2	+1 1/8	+2.7
O	COMPUTER DEVICES INC	4- 21	13 1/4	+ 7/8	+7.1
O	COMPUTER TRANSCEIVER	4- 8	7 3/4	+ 3/4	+10.7
N	COMPUTERVISION CORP	18- 41	40 3/8	+2 3/8	+6.3
N	CONRAC CORP	21- 36	34 1/4	+1 3/4	+5.3
A	DATA ACCESS SYSTEMS	2- 5	1 1/8	+ 3/8	+50.0
A	DATAPRODUCTS CORP	16- 40	39	+3	+8.3
A	DATARAM CORP	5- 12	11 3/8	+ 3/8	+3.0
O	DATUM INC	2- 9	8 1/2	+ 3/8	+4.6
O	DAVID JAMISON CARLYL	2- 7	3 3/4	+ 1/8	+3.4
O	DECISION DATA COMPUT	3- 14	13 5/8	+2	+17.2
O	DELTA DATA SYSTEMS	1- 3	1 7/8	- 1/4	-11.7
N	ELECTRONIC M & M	3- 6	5 1/4	0	0.0
O	EVANS & SUTHERLAND	18- 48	45 3/4	+1	+2.2
O	GANDALF TECHNOLOGIES	10- 22	15 7/8	+1 1/4	+8.5
N	GEN'L DATA COMM IND	6- 19	18	+ 1/8	+0.6
O	GENERAL TERMINAL CP	0- 4	5/8	0	0.0
O	GREAT SOUTHWEST IND	2- 9	3	- 1/2	-14.2
N	HAZELTINE CORP	22- 48	47 5/8	+7 5/8	+19.0
O	ICOT CORP	3- 9	8 5/8	+1	+13.0
O	INFORMATION INTL INC	10- 22	19	+1 1/4	+7.0
O	INTEL CORP	21- 48	42 1/2	+2 1/4	+5.4
O	IPL SYSTEMS INC	5- 9	6 3/4	- 1/4	-3.5
A	LUNDY ELECTRONICS	7- 15	14 1/2	+1 3/4	+13.7
A	MSI DATA CORP	14- 36	24 7/8	-6 7/8	-20.2
O	NETWORK SYSTEMS CORP	15- 42	38 3/8	+3	+8.4
O	OREX	3- 6	3	0	0.0
N	PARADYNE CORP	24- 50	41 1/8	-1 5/8	-3.8
A	PENRIL CORP	7- 12	10 1/4	+ 1/2	+5.1
O	RAMTEK CORP	12- 22	20	- 1/2	-2.4
A	RECOGNITION EQUIP	6- 12	11 3/4	+1	+9.3
O	SCAN DATA	1- 5	1 3/8	+ 1/8	+10.0
N	STORAGE TECHNOLOGY	16- 40	22 1/8	-1 3/8	-5.8
O	SYKES DATATRONICS	6- 34	13 5/8	+ 1/8	+0.9
A	T BAR INC	7- 13	12 3/4	+1 1/2	+13.3
A	TEC INC	4- 12	9 3/8	+ 5/8	+7.1
N	TEKTRONIX INC	34- 68	66 1/4	+1	+1.5
N	TELEX	5- 27	23 1/2	-1 5/8	-6.4
O	TESDATA SYSTEMS CP	3- 10	8	+ 1/4	+3.2
A	TIMEPLEX INC	7- 24	21 3/4	- 1/8	-0.5
B	VISUAL TECHNOLOGY	8- 18	17 3/4	0	0.0
O	WILTEK INC	1- 3	1 3/4	0	0.0

SUPPLIES & ACCESSORIES

EXCH		1982-83 RANGE (1)	CLOSE FEB 2 1983	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN BUS PRODS	11- 19	18 3/8	+ 1/4	+1.3
O	BALTIMORE BUS FORMS	1- 2	1 1/4	0	0.0
N	BARRY WRIGHT	13- 22	18 7/8	0	0.0
O	CYBERMATICS INC	1- 1	1	+ 1/8	+14.2
A	DUPLEX PRODUCTS INC	12- 20	17 3/4	- 1/4	-1.3
N	ENNIS BUS. FORMS	18- 30	26	+ 1/2	+1.9
N	3M COMPANY	48- 80	75 3/8	+1 3/4	+2.3
N	MOORE CORP LTD	38- 44	42 3/4	+ 1/2	+1.1
N	NASHUA CORP	9- 18	10 3/8	- 3/8	-3.4
O	STANDARD REGISTER	32- 72	68 1/2	+5 1/2	+8.8
N	TAB PRODUCTS CO	12- 32	31 3/8	+3 3/8	+11.8
N	WALLACE BUS FORMS	22- 51	50	+ 5/8	+1.3

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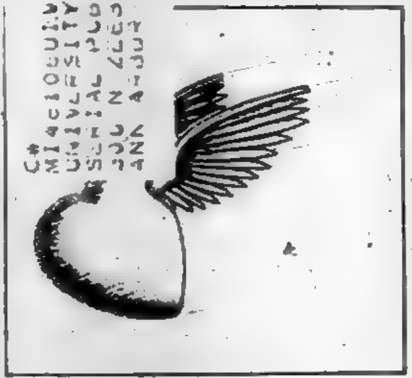

Be Mine

Valentine's Day makes February one of the rosiest months for FTD, the Florist Transworld Delivery Association. Its Mercury Network, which links some 16,000 cities and towns, is expected to deliver 500,000 orders around the country through one of the nation's largest private voice and data networks. How will it handle the Valentine's Day crunch? Story on Page 6.

Maintenance? Do It Yourself

By Marguerite Zientara
CW Staff

Gone are the days when a team of field engineers was assigned to "baby-sit" each and every CPU in the country. Today, hardware maintenance is becoming a do-it-yourself proposition that features self-testing machines, remote diagnostics and customer maintenance.

The reasons? Strictly economic. Support is a manufacturer's most expensive after-sale item, totaling 30% to 40% of an installation's cost and projected to reach 50% if traditional trends continue, according to a study titled "Maintenance Technology Trends — System Products" from International Data Corp. of Framingham, Mass.

User Spotlight

"Whereas the cost of a computer system has come down a hundredfold, the cost to staff and support a comparable field engineer is four or five times as much as it used to be," the vice-president of field engineering for a major small business systems firm told IDC (see Figure 1 on Page 11).

Complicating that situation are trends toward more complex hardware, the addition of software and communications as maintenance responsibilities and a shortage of trained and qualified service technicians, IDC reported. They have put vendors under tremendous pressure

(Continued on Page 11)

Micros Blitz DP, Corporate Users

• DP Caught Off Guard

By Paul Gillin
CW Staff

The unanticipated explosion in business demand for microcomputers has caught most DP departments by surprise. As a result, few companies have had time to develop strategies for integrating micros into the corporate structure.

In cases in which DP has taken the lead in formulating such strategies, the methods adopted are nearly as varied as the kinds of machines available. But in many cases, DP departments have been largely excluded from the planning process. Some DP managers still prefer to avoid the topic of micro buying altogether.

Those are the conclusions of interviews recently conducted by *Computerworld* with analysts, corporate buyers and retail sellers of microcomputers. They agree with the findings of a recent study conducted by Advanced Management Research, Inc., which determined that corporate users are readily plunging into the microcomputer jungle "without seeking the advice and counsel of individuals who manage the existing information systems organization."

The study concludes that individuals fear that professional advice could actually impede a new-found privilege that it calls "the freedom to compute."

DP executives who were interviewed confirmed that

(Continued on Page 4)

• IBM Bares Its BSC Net

By Bruce Hoard
CW Staff

BOCA RATON, Fla. — IBM for the first time has opened up the huge installed base of communications networks using the Binary Synchronous Communications protocol to its Personal Computer users by unveiling a combination hardware/software package that emulates 3270 devices running under BSC.

The firm is more aggressively marketing its previously introduced 3270 Synchronous Data Link Control protocol, but BSC is the most commonly used protocol on IBM mainframe-based communications networks.

(Continued on Page 4)

IPL Systems Unveils Competitor to 4341

By Paul Gillin
CW Staff

BOSTON — IPL Systems, Inc. last week introduced an IBM plug-compatible computer system that features parallel redundancy and, with its second processor, is said to be nearly twice as powerful as IBM's single-processor 4341 Model Group 12 machine.

The Model 4480 utilizes two tightly coupled, independent CPUs sharing a partitioned main storage, reportedly to achieve complete system redundancy. The processors may be used in tandem, operating under IBM's MVS or VM operating systems, or may act as two uniprocessors running different applications under MVS, VM, DOS/VSE, OS/VS1 or ACP/TPF licensed programs. The system is said to be fully compatible with IBM 4341 software.

The 4480 tops off IPL's plug-compatible systems line and marks the

(Continued on Page 8)

Hitachi Enters Guilty Plea In IBM Trade-Secrets Theft

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — Hitachi Ltd. and two of its employees pleaded guilty last week to charges that they conspired to transport stolen IBM trade secrets from the U.S. to Japan.

The guilty pleas were entered Feb. 8 before U.S. District Court Judge Spencer Williams, who sentenced Hitachi to pay a $10,000 fine — the maximum penalty under American law.

Williams also heard guilty pleas from Kenji Hayashi, a senior engineer involved in Hitachi's hardware planning efforts, and Isao Ohnishi, a section manager attached to the Japanese company's systems programming department.

Hayashi was ordered to pay a $10,000 fine and was placed on five-year probation, while Ohnishi was fined $4,000 and was slapped with a two-year probation.

The terms of Hayashi's and Ohnishi's probation expressly forbid the pair from transacting business for Hitachi or its subsidiaries anywhere in the U.S. Otherwise, both men are pretty much free to come and go as they please.

Last week's courtroom actions here constituted just one more development in a continuing international dispute that erupted last June when FBI agents posing as gray-market electronics dealers exposed an alleged Japanese plot to steal IBM trade secrets. The government sting operation resulted in criminal indictments against Hitachi, Mitsubishi Electric Corp. and more than 20 of their employees or alleged agents.

Hitachi and Mitsubishi were ac-

(Continued on Page 8)

CW Photo by J. Kirchner

Tip Talks to High Tech

Speaker of the U.S. House of Representatives Tip O'Neill last week cautioned computer and communications executives that the government would not desert basic industries to support high tech. Story on Page 6.

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Please address all correspondence to the appropriate department at Box 880, 375 Cochituate Road, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153.

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60-Day Delay

FBI/Secret Service Link-Up on Hold

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The Federal Bureau of Investigation last week granted a congressional request to delay using FBI computers for surveillance of persons the Secret Service believes threaten the president and other government officials.

At a hearing on the matter last Wednesday, Rep. Don Edwards (D-Calif.) indicated there likely will be legislation addressing this use of the FBI's National Crime Information Center (NCIC) system, a use Edwards termed "revolutionary" in terms of federal agency jurisdiction and civil liberties. The Justice Department told Edwards' Judiciary Subcommittee on Civil and Constitutional Rights that the Secret Service file is not a drastic policy change and said the FBI does not believe new statutory authority is needed to implement it.

At issue is a plan first proposed in late 1981 following a government review of the management practices of the Secret Service, a review prompted by John W. Hinckley Jr.'s wounding of President Reagan in March of that year.

Under the plan, the Secret Service would add to NCIC files a list of persons — now numbering approximately 125 — whom the agency has determined are a demonstrated threat to the safety of persons under Secret Service protection [CW, Jan. 17]. Eighteen persons are now under the agency's protection.

If any of the 300,000 or so daily queries to the NCIC system — particularly from local law enforcement officers for background information on individuals they come in contact with — pertained to someone on the Secret Service list, that agency would be notified. This, the service said, would help it keep track of dangerous persons. The local agency would also be notified of the "hit," a provision that is the source of much of the controversy over the system.

Opponents of the plan, such as the American Civil Liberties Union, argue that the information that an individual is the subject of Secret Service surveillance would be used against him, perhaps in bail or sentencing hearings, even though that person is not suspected of any previous criminal activity. It is also feared that data could be used in some jurisdictions to deny those individuals jobs or licenses.

A Dangerous Precedent?

In view of the Secret Service's admission that the system would be of limited utility in furthering its protective mission, the House subcommittee is looking at the larger question of the possibly dangerous precedent that would be set by using the NCIC for surveillance, a use that has always been forbidden by Congress.

Subcommittee members last week voiced concern that the system, unless regulated, could conceivably be expanded to include political opponents of the administration. Edwards' Subcommittee on Civil and Constitutional Rights, which has jurisdiction over NCIC policy and operations, asked the FBI to delay implementation of the plan until it could be scrutinized by Congress. FBI Director William H. Webster last Wednesday agreed to hold off for 60 days on the project, which otherwise would have gone into effect last week.

The subcommitee will continue hearings this week and is reportedly planning a more general look into NCIC polices, an investigation being aided by the General Accounting Office. Edwards said last week that Secret Service use of NCIC should be strictly controlled by a statute "everyone could live with" and not by FBI "regulations that could be changed overnight."

Correction

In a story appearing in the Systems & Peripherals section entitled "Prime Slashes Prices of 550-II-2MC Superminis" [CW, Feb. 7], it was erroneously reported that Prime Computer, Inc. had cut maintenance prices on its software, printer and terminal products by 10% to 15%. In fact, Prime has increased the price of those products by 10% to 15%.

This Week

IN DEPTH

Data Is Money ....Follows Page 82
Systems With Staying Power ID/11
Putting Your Data on the Line ID/21
Software Methodologies ID/27

NEWS

Ask Us About Micro Purchases, DP Managers Say ..4
DP Managers Looking to Establish Micro Policy 5
FTD Net Sweetens Valentine's Day Delivery 6
Poll Finds Service Calls Preferred to Self-Testing ..10
Maintenance Seen Complex, Costly Proposition ...11
Third-Party Maintenance Firms Going Strong 12
Programmer Extinction Predicted 14
Prototyping Hailed as User-Tailored Approach 15
Fully Integrated Systems Seen Wave of Future 16
BAI Plans Bank DP Auditing Certification 17
MIS Pros See Increase in DP Activity, Upheaval ...18
Multinational Firms Warned on DP Security 19
Exec Outlines 'Time-Wasters' 20
Attorney Develops Analysis Tool for Lawyers 21
Off the Press 24
Micro Boom Seen Sparking False Assurance 35
Automated Stock Exchange Replacing Humans ...36
Bell Exec Predicts Data Rates of 50M Bit/Sec 37
Turnaround Time 39

EDITORIAL

Editorial: Buying Certification 58
Softline: What's Going On Down Under? 59
Human Connection: DP Collegians' Expectations ..59
Getting Ahead in DP: Promotions 64

SOFTWARE & SERVICES

Second User Pleased With Stratagem DSS 67
SPI Enhanced for 370, 3080 68
Security Packages Target Micros 70
Some Tips on Protecting Software 71
'Pacs' Management Tool Enhanced 73
Package Manages Correspondence Programs 74
Natural Language Users Get Vsam Access 75
Docu/Text-200 Release Out for IBM 76
Multiterminal Utility Out 77
Authoring System Announced 80
Payroll Added to Management System 81

COMMUNICATIONS

Net Architecture Options Seen Confusing 83
IBM Expands Peripherals Available for 4700 84
RS-232 Fiber-Optic Link Debuts 88
DEC Minis Get Mux/Concentrator 90
Intelligent Controller Out for DEC Hosts 92
TC103 Targets Local Nets 96

SYSTEMS & PERIPHERALS

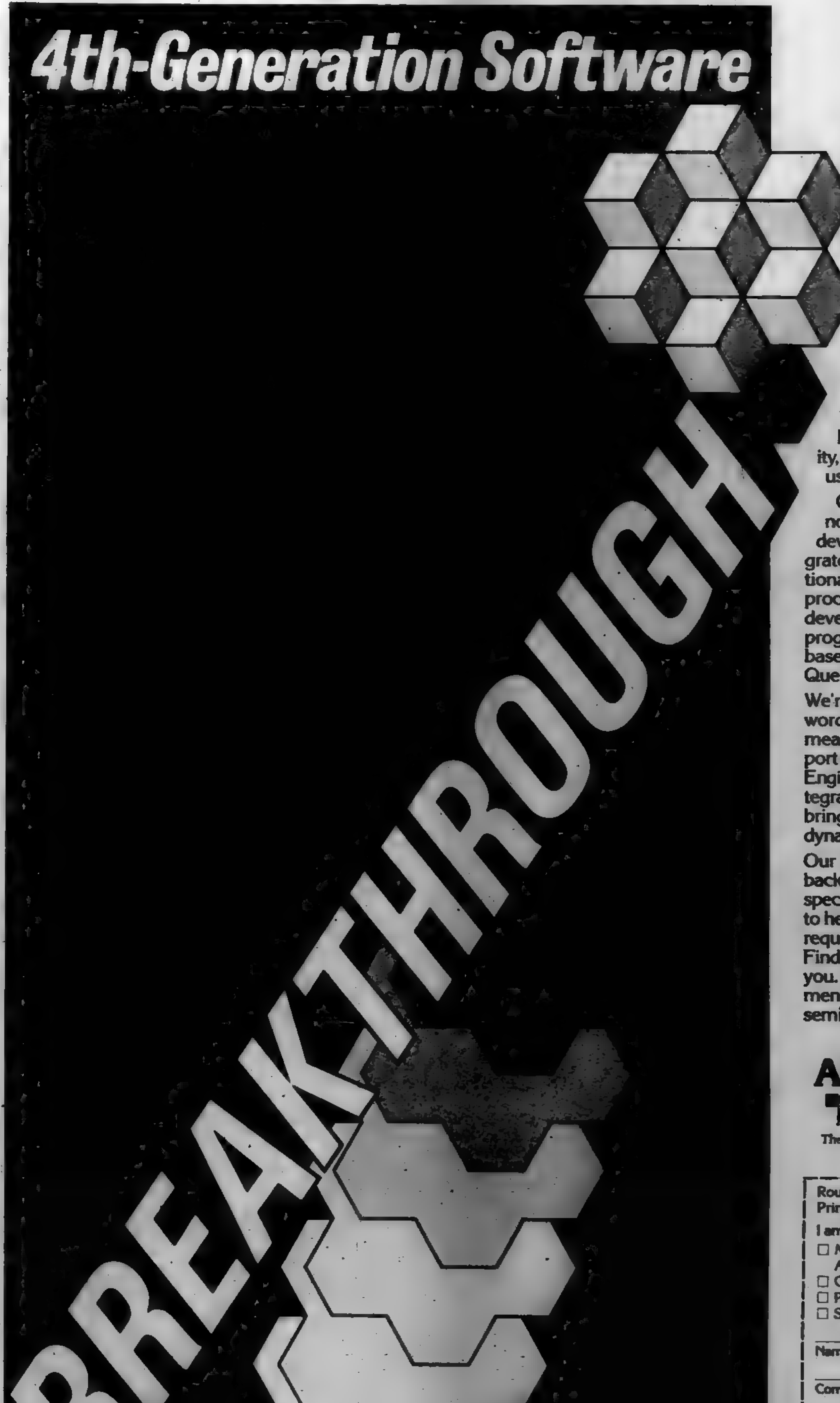
Supermini, Workbench Offered in PE Package 97
Medical Software Firm Survives System Deluge ...98
Inventory Turnkey Targets Retail's Hot Items 100
Multiuser Business Micro Unveiled 102
CAD/Drafting Line Bows 103
Controller Out for HP 3000 107
IBM Computer-Controlled Robotic System Out ...108
Aid Turns IBM Micro Into Design Workstation 109
Power System, Conditioners Out 110

OFFICE AUTOMATION

Consultant Warns Against PBX Claims 115

COMPUTER INDUSTRY

SIA Documents 'Proof' of Japanese Harm 117
Dialogue With PE's McDonell 117
Inman Defines Goals of Fledgling MCC Venture ..120
'Atlantic' DPers Warned of Resting on Laurels ...122
Geisco to Test NEC's First High-End CPU in U.S. .125
Court Rules Software 'Intangible,' Untaxable 128
Calif. Bill Proposes Custom Software Sales Tax ..129
Bills Would Heighten High-Tech Export Control ..130
Fight Brewing Over Renewal of Export Act 134
CCIA Head Sees AT&T-BOC Remaining Cozy ...136
Service Sector Changes Seen Impacting Field ...137
Group Warns Against Matching Federal Policy ...139
Burroughs Reports Profits Nose-Dive 22% in '82 .140
ADVERTISING INDEX 162



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CW 2/14

Ask Us About Micro Purchases, DP Managers Say

Although widespread interest in microcomputers for business is a relatively new phenomenon, some firms were formulating micro integration strategies as long as two years ago.

Methods vary, but *Computerworld* interviews with DP managers who are in charge of buying micros at several companies indicate that the most successful plans involve the data processing department as a central clearinghouse for information, training and support.

A permanent display acts as showroom and demonstration center at the headquarters of Southern New England Telephone in New Haven, Conn. "If departments think they have a use for a micro, instead of scurrying all over the state, they can come to the display," said Art Bernardini, staff manager for information and microcomputer centers.

DP-Sponsored Information Team

Data processing sponsored and committed four staff members to the project, Bernardini said. The team provides basic information to potential users, analyzes the department's needs, recommends a hardware/software configuration and buys the system at a corporate discount. The micro is delivered directly to the DP center where it is unboxed and tested before delivery to the user site. The staff also offers training and ongoing support.

"The results have been startling," Bernardini said. "Most people are interested only in seeing if they can use a micro. Once they come [into the display center], they want one."

The company's DP department even recommends micro applications for jobs that previously would have been done on the corporate mainframes. "If someone has a small job, we can offer them the option of a job costing $60,000 and three programmers or an application on a micro," Bernardini said. "The turnaround time on the micro is usually much quicker."

The approach taken by the Big Eight accounting firm of Arthur Andersen & Co. last year is more typical of the micro integration plan used at large companies. According to John Haner, director of computer aids to tax practice, a task force was formed in September 1981, composed of representatives from the company's major departments. "We sat down looking to come up with the same machine because of the advantages of compatibility," Haner said.

The committee negotiated a contract with a major dealer in December 1981 and has overseen the incorporation of more than 700 microcomputers in the last year. Individual departments are still free to find their own best deals, Haner said, but the committee recommends machines and configurations.

"We're now mainly concerned with how these [micros] are going to interact with each other," Haner said. "If we have a strategy, it has more to do with trying to achieve the state of the art and keeping a couple of jumps ahead with technology."

Over 100 Micros Installed

More than 100 IBM Personal Computers have been installed at the First National Bank of Chicago since the job of procurement was handed over to the Management Information Systems (MIS) Department early last year. The department makes advice and demonstrations available to employees and sets up training courses for users, according to Jack Phillips, hardware and software consultant in the Systems/MIS department. The group also coordinates buying. A separate advanced technology group within MIS evaluates new technologies and software.

The department does not recommend a configuration if the user does not want one, Phillips said. "Some people know exactly what they want and they just send us a bill of materials to get for them. Other people want us to configure something for them and tell them how to use it. We do that too."

Phillips said that long lead times on desktop computers have led his department to recommend micros for specific solutions. "To discourage people from sitting around and waiting for that machine, we give them

(Continued on Page 5)

Micro Integration Puts DP Under the Gun

(Continued from Page 1)

the rapid spread of microcomputers has caught them off guard. "Originally our focus was to present a sane and orderly manner in which micros could be introduced," said the manager of a microcomputer project at a major company in the Northeast. "That was an appealing thought at first, but we realized that word can spread like wildfire and that [management information systems] directors at various [subsidiaries] did not have adequate personnel in place." He said the company has "tried to restrict the sphere" of micro activity in recent months until a coordinated strategy can be developed.

"I'm afraid it's happening too often that users want a microcomputer and when they get it they don't know how to use it," said Jack Phillips, a hardware and software consultant who coordinates microcomputer buying at the First National Bank of Chicago.

"[Potential buyers] still don't look to the MIS area for much in the way of guidance," said Tom O'Flaherty, a principal consultant for Input, Inc., a research group, and coauthor of a recent report on integrating micros into big business. "What is still the most common instance is individuals and departments buying [micros] themselves and not asking anybody anything."

Analysts contend the problem lies in the speed with which microcomputers have caught on. Input found that more than 75% of the departments using personal computers began doing so in the last year and over 40% have started using micros in the past six months.

Moreover, Input reports, user satisfaction with personal computers is "extremely high," further fueling the rush to computerize. The study predicts that annual hardware expenditures for personal computers will increase at the astronomical rate of 42% per year through 1987. AMR predicts that more than 10 million of the machines will be installed by 1986.

United Technologies Corp. last year introduced a limited program to buy personal computers for executives for business use. The program caught fire so quickly that the limited plan may have to be expanded.

"The response has been considerably higher than I expected," said Dr. John Bennett, director of data processing. "Our target group was roughly 1,100 people. We would have been tickled silly if we had got 800 or 900 of them. But I now feel no doubt that we'll reach the target as a minimum."

Managers Want Control

Some retail sellers of microcomputers said they see managers anxiously trying to exert some control over the runaway popularity of micros, often without success. "Some amazingly large companies have a policy where a guy comes in, buys without a discount, we deliver it, another department hears about it and then they come in," said Richard Danstrom, manager of Computerland in Chicago. "I'm sure eventually the purchasing agent is going to say, 'Wait a minute, we've got six or seven guys out there buying separate systems.' "

"The concern I see is that [DP managers] want to get selection and acquisition of micros under control quickly before it gets out of control," said Matt Fitzsimmons, owner of a Computerland franchise in White Plains, N.Y., and organizer of a group of managers who coordinate microcomputer buying in their firms.

Fitzsimmons said the changing role of the microcomputer is evident in the makeup of the group, which is limited to 25 members. "I've seen the whole complexion of this group change over the past year or so," he said. "Initially [microcomputer planning] was someone's part-time job, which then became someone's full-time job, and now most people have one or two staff people assigned to the task. And they're getting more visibility on microcomputers than they would ever get on mainframes."

"You're sort of seeing the whole history of data processing going before you at a much faster rate," O'Flaherty said. "I don't think [MIS] organizations are used to this kind of high-velocity planning. The question is, are microcomputer buyers going to make the same mistakes" that DPers made 20 years ago?

Package Gives IBM Micro 3270 Emulation

(Continued from Page 1)

At the same time, IBM also introduced a full-screen editor and software that runs application programs written for UCSD P-System Version IV.03.

The BSC package was developed by Micro-Integration, Inc. of Friendsville, Md., and is offered to IBM through IE Systems, Inc., Micro-Integration's U.S. marketing agent.

The BSC Adapter is the hardware portion of the emulation package. It provides the ability to attach the Personal Computer to host systems or other Personal Computers via switched or leased-line networks using BSC protocols.

The adapter is installed as an option in one of the five system expansion slots and operates at up to 9,600 bit/sec. An external synchronous modem must be connected between the adapter and the telephone line. The adapter costs $300 and is available at IBM product centers.

The software portion of the package is known as Binary Synchronous 3270 Emulation Version 1.0. When used with the adapter, it allows the Personal Computer to act as a terminal that can communicate with a host system as if it were a BSC 3270 device. It requires 128K bytes of user memory, costs $700 at IBM product centers and, like the adapter, will be available in March.

The emulator runs under the PC-DOS operating system. Supported devices include 3271/3277, 3274/3278, 3275 and 3276. Other features include a menu-driven configuration, separately addressable printer support and a send capability that permits off-line data entry of 3270 records and subsequent transmission on an automatic or semiautomatic basis.

Previous hardware and software products announced for the Personal Computer include the SDLC adapter, an asynchronous adapter, asynchronous communications support, Systems Network Architecture 3270 emulation, Remote Job Entry support and IBM 3101 emulation.

The UCSD P-System Runtime Support package for the Personal Computer provides the software necessary to run application programs written for the UCSD P-System Version IV.03, as well as utility programs for formatting, copying and maintaining diskettes.

With it, many P-System application programs written in UCSD Pascal, Fortran-77 or P-System Basic may be run on the Personal Computer without change or without requiring license of the full P-System, IBM claimed.

IBM also said users should consult with their dealers to determine if specific application programs can be run under the package. It costs $50 from IBM product centers.

The IBM Personal Computer Professional Editor requires 96K bytes of user memory, but can take advantage of up to 128K bytes. It offers menus, function keys, scrolling, search/change facilities, line commands and primary commands. Available at IBM product centers, it costs $130.

No Basking in Glory

DP Managers Looking to Establish Micro Policy

DP departments that have taken a role in integrating microcomputers into the corporate structure are by no means basking in the glory of their foresight, according to DP managers interviewed by *Computerworld*. Concerns about new technology, compatibility and control loom as potential future trouble spots.

"The concern at this point is just putting together a policy such that the company has some direction in dealing with the selection and acquisition of micros," said Matt Fitzsimmons, owner of a Computerland franchise in White Plains, N.Y., and organizer of a group of managers who coordinate microcomputer buying in their firms. "Invariably, we begin each of our meetings with a discussion of policy considerations," Fitzsimmons said.

"They worry about being able to expand, being able to communicate between the different machines, building the machine up memory-wise and the software market," said Gary Toisa of Computerland of Los Angeles. "That's why a lot of them are going with the IBM Personal Computer."

Just keeping up with the vast range of technical information is a concern to Jack Phillips, hardware and software consultant in the systems/management information systems department at the First National Bank of Chicago. "We just try to hit all of the trade publications and hope the vendors keep coming at us," he said.

"There is no one single place for this information," said the micro project manager at one Northeastern firm. "You can't just sign up at your handy-dandy university or adult education school. We need the opportunity to pass along crystallized intelligence to our corporations."

Compatibility is a major concern as well. "We're mainly concerned with how these computers are going to interact with each other," said John Haner, director of computer aids to tax practice at Arthur Andersen & Co. in Chicago. "In time, the major issue will be their ability to become the professional workstation that can be used for office automation and administration as well as individual needs," Haner said.

"The thing that bothers me is what's on the horizon that will make these things obsolete," Phillips said. "I would hate to have all software in for an IBM [Personal Computer] and have something come along that would negate the purchase of all that software."

Managers Urge DP Involvement

(Continued from Page 4)

an IBM Personal Computer and word processing software," he said.

At Chase Econometrics/Interactive Data Corp. in Waltham, Mass., microcomputers have been a hot topic for two years. The computer services, time-sharing and product development company set up a new division to incorporate micros into the firm and instituted a generous purchase plan for employees.

"Nearly all of the people here are computer literate, but most had never used a microcomputer," said Fred Ciarmaglia, vice-president of the New Technology Division. The division formed a group of representatives from each division to settle on configurations and planning.

Nearly every division got a micro for the marketing representatives and consultants to use, Ciarmaglia said. The company also instituted a purchase plan for employees to buy their own microcomputers, with the company picking up 50% of the cost and the employees permitted the option of having the remaining 50% deducted from their paychecks over three years. Last year's offering of 100 micros was a hit, Ciarmaglia said, and the program will probably be continued in 1983. "Now we're in the process of going from a start-up to a full-blown situation," he said.

Rolm Accuses Snet Of PBX Price Cutting

WASHINGTON, D.C. — Rolm Corp., a major independent manufacturer of private branch exchange (PBX) equipment, last week accused the Southern New England Telephone Co. (Snet) of selling PBX equipment at below-market prices and asked the Federal Communications Commision (FCC) for relief.

Snet's alleged price cutting, Rolm said, was made possible by the FCC. Under the Second Computer Inquiry Decision, Bell operating companies could not market new terminal equipment as of last Jan. 1.; instead, it must be offered by AT&T through a separate, deregulated subsidiary — for instance, American Bell, Inc. But Snet and one other operating company in which AT&T has only a minority interest, Cincinnati Bell, asked the commission to waive this requirement for them, and the commission recently did so.

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Love at 1,200 Bit/Sec

FTD Net Sweetens Valentine's Day Delivery

By Jim Bartimo
CW Staff

CHICAGO — If you sent flowers to your spouse or lover today, the chances are good that your order was relayed over one of the nation's largest private voice and data networks — the Mercury Network of the Florist Transworld Delivery Association (FTD).

"Valentine's Day makes February one of our heaviest months," according to Jim Jordan, director of Mercury administration. "We expect about one-half million orders to be delivered." But February the 14th is only the third rosiest day for FTD, falling behind Mother's Day and the busiest day of the year — Christmas.

The 9,000-member network stems out from two redundant Sperry Univac 1100/10 mainframes located here and branches out to florists across the country over dial-up lines. Mercury subscribers use a specially designed intelligent console from Ford Aerospace and Communications Corp. that includes automatic dial, automatic answer and a modem, said Bob Poirier, director of operations for Floral Network, Inc., a wholly owned subsidiary of FTD.

When Ordered

When an order for flowers is made at any member florist shop, it is transmitted at 1,200 bit/sec or less to the central computer system, downline loaded and relayed to the receiving florist for delivery in what is usually about 10 minutes. But during a peak period such as Valentine's Day, orders are farmed out in two to four hours, Poirier said.

The console interfaces with the host system through three telephone calls transparent to the user over a Wats line. Each console is equipped with 26K bytes of combined random-access memory and read-only memory and a 30 char./sec dot matrix printer, Poirier said. Both flower orders and electronic messages are sent over the network.

A front-end communications controller allows each modem to be directly connected to a port, Poirier said. "It's a store-and-forward system," Poirier said. "When an order or message is given, it's stored in the console's scratch pad memory." About 10 orders or messages can be stored in the console until they are ready to be sent.

But the Mercury Network — covering some 16,000 cities — is not without its thorny problems. "In dealing with a nationwide network, you're dealing with a lot of different telephone companies," Poirier said. "We still have to deal with things like operator intercept."

Another problem feared is a system failure, especially at peak times such as today. "The Univac system is fully redundant," Poirier said. "The only reason for a stop would be a data base failure. Ninety percent of all stops are for 10 minutes or less and are transparent to the users — they look like transmission failures."

End-user florists pay anywhere from $30 to $70 monthly to use the Mercury Network and a nominal fee per order or message transmission. "We also offer batching discounts," Jordan said, when orders are heavy and sent all at once.

There will also be some staff additions in the main office to handle today's high volume. "We have a staff of seven programmers and 20 customer service people," Poirier said. "A staff of 10 to 75 handle call forwarding [depending on the time of year] — there will be 45 on Valentine's Day."

Anxious not to be stuck in the system manager's rose garden, Poirier plans to build on the network and use it for telemarketing, market research and as an accounts management tool. The Univac application generator, Mapper, is also on-line for the main office staff. "We're trying to expand into a service bureau network," Poirier said.

The seeds for the Mercury Network were sown in the late '70s when Ford Aerospace and other vendors completed the final version, Poirier said. But the system was riddled with a swarm of bugs until it was finally purchased by Floral Network, Inc. in 1979 and controlled by FTD. Now, 100 terminals are added per month, entering some 250,000 orders and messages per day — bringing to FTD the sweet smell of network success.

O'Neill Urges Balance in High-Tech Support

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Rep. Thomas P. O'Neill (D-Mass.), speaker of the U.S. House of Representatives, told computer and communications industry executives last week that federal government support for high-technology development must not be at the expense of established "smokestack" industries.

Noting that President Reagan's recent State of the Union address stressed the importance of the electronics industry to the U.S. economy, O'Neill cautioned, "There is no need to write off the present for the future."

Addressing a meeting of the Computer and Communications Industry Association (CCIA) here, O'Neill said, "While we must encourage the growth of the high-technology industry, we must not assume that it can take the place of our basic industries as the major employer of millions of currently unemployed or underemployed Americans.

"It simply does not make sense to encourage high technology through a national strategy and have no strategy for saving our basic industries," O'Neill said. "There is a need to prepare the present for the future by preserving our industrial base by reviving our economy and at the same time promoting our future by encouraging investment in technology."

As speaker, O'Neill controls what legislative measures come up for final action in the House. As one of the highest ranking Democrats, he has considerable influence over development of his party's strategy alternatives to the president's economic programs.

O'Neill noted that "politicians and policymakers have been setting their sights on the high-technology industry," and he assured the CCIA executives that his party is aware that the industry, although one of the few successes during the current economic recession, is faced with eroding international competitiveness.

"Right now we have a commanding lead in basic research and high-technology industries," he said, adding, "but as you well know, we face serious problems and challenges today and in the future . . . I know your concern about competition from Japan. I share it."

He indicated that his party's concern for the high-technology industry will probably not result in legislation to protect American firms from foreign competition. He expressed the hope that "wiser minds" will continue to ward off protectionism in the country, but said that if there is continued perception on Capitol Hill that foreign countries are not trading fairly, there is a good chance of some sort of retaliatory legislation.

O'Neill acknowledged that the House overwhelmingly approved a bill in the final days of the last Congress to protect American automakers from Japanese competition. But, he said, the bill was passed with the knowledge that the Senate would not take similar action and was passed only "to send a message to the Japanese people" about fair competition. Although there is more protectionism sentiment in Congress now than ever before, O'Neill said, for the moment at least, "we think the message has been sent."

O'Neill's address to the CCIA was strongly partisan; at one point he accused the Reagan administration of treating the U.S. as "a testing ground for economic theories." But he emphasized the need for a bipartisan approach to solving the country's economic problems.

Pushing a Democratic alternative to getting the country back on its feet, O'Neill called for emergency relief of the homeless and hungry and a quick emergency jobs program. "The second phase," he said, "will be public investment in areas like basic research and education to lay the foundation for long-term economic prosperity; the third phase will focus on encouraging economic cooperation between labor, business and government to promote American productivity and competitiveness at home and abroad."

DPMA Foundation Taps Spiro as VP

PARK RIDGE, Ill. — Bruce E. Spiro, chief of the Defense Communications Agency's (DCA) ADPE Systems Management office, has been elected vice-president of the Data Processing Management Association (DPMA) Education Foundation.

Spiro has been a regent of the Education Foundation since early 1982. He has served as head of systems for the DCA since 1965.

The DPMA Education Foundation was formed in 1975 to expand educational opportunities for information systems professionals and to conduct research programs. It is located at 505 Busse Highway, Park Ridge, Ill. 60068.

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IPL Unveils Competitor to IBM 4341 Group 12

IPL SYSTEMS, INC.

System Characteristics	4436	4443	4445	4446	4460	4480
Relative Performance[1]	27	45	56	70	81	129
Mips[2]	.43	.79	.94	1.2	1.4	2.2
Memory Size in Bytes (Minimum-Maximum)	1M-4M	2M-8M	2M-16M	2M-16M	2M-16M	8M-16M
Purchase Price[3] (Memory Size)	$151,000 (4M)	$228,000 (8M)	$225,000 (8M)	$331,000 (8M)	$344,000 (8M)	$611,800 (16M)
Lease Price (Lease Term)	$6,160 (2 Year)	$8,300 (2 Year)	$9,905 (2 Year)	$11,500 (2 Year)	$13,500 (2 Year)	$24,255 (2 Year)
Machine Cycle Time (Nsec)	50	50	50	50	50	50
Channels (Minimum-Maximum)	3-6	3-6	6	6	6	10
Cache (Buffer) Size	None	8K	8K	16K	24K	48K
Bus Architecture?	Yes	Yes	Yes	Yes	Yes	Yes
Price per 1M Byte Of Main Memory	$8,000	$8,000	$8,000	$8,000	$8,000	$8,000

[1] CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.

[2] CW estimates.

[3] Includes processor, console, power supply and all prerequisites.

CW Chart

IPL Systems 4400 Series

(Continued from Page 1)

first time the 10-year-old firm has ventured into a market area not already occupied by IBM — in this case, fault-tolerant computing.

When running as a multiprocessor, the 4480 operates at 2.7 million instructions per second (Mips), according to William Manser, vice-president of sales. In comparison, the 4341 Group 12 processes 1.2 Mips, while the 3083-E runs 3.1 Mips. If one CPU fails, the system can continue operating at 50% to 60% capacity without interrupting computer operations, Manser added.

The 4480 can also be operated as two independent systems, with one used to run production applications while the other can be devoted to new applications development, the spokesman said.

Like most plug-compatible machines, IPL's 4480 is also priced less than its IBM counterpart. For instance, the 4480 costs about $225,000/Mips compared to $300,000/Mips for the 4341 and $340,000/Mips on the 3083, Manser said.

The system is available with 8M, 12M or 16M bytes of partitioned, independent, dual-ported main storage modules as well as a 1M-byte active, spare main storage module that can be used for running diagnostic programs or as a backup to a failed memory board, the spokesman said.

The 4480's two processors execute concurrently with tasks dispatched interchangeably to the processors as they become free, officials said. When one processor fails, the surviving processor executes recovery routines and takes over all CPU operations. The failed unit can be varied off-line, repaired and brought back up without affecting the other processing unit, the spokesman said.

Other features include dual independent channel sets with a total of two byte multiplexer and eight block multiplexer channels, four high-speed buffers totaling 48K bytes, internal cycle time of 50 nsec, dual-system consoles and dual remote maintenance capability.

With the 4480 announcement, IPL takes its first step out from under the 4341 umbrella. The 10-year-old company's previous products, including the 4436, 4443, 4445, 4446 and 4460 were marketed as cheaper versions of comparable models in the IBM 4341 series.

By firing an arrow into an acknowledged Achilles' heel in the IBM product line — the firm's lack of a redundant computer system — IPL is attempting to establish itself as something more than just another plug-compatible manufacturer, said IPL President Steve Ippolito.

Shipments of the 4480 will begin in the third quarter of 1983, the spokesman said. The 4480 will be priced at $547,800 for an 8M-byte version with a two-year lease costing $21,225/mo. A 16M-byte version costs $611,800 with a two-year lease priced at $24,255/mo.

IPL is located at 1370 Main St., Waltham, Mass. 02254.

Hitachi Pleads Guilty in Trade-Secrets Case

(Continued from Page 1)

cused of paying federal undercover agents $622,000 and $26,000, respectively, in exchange for confidential documents describing IBM's latest and most advanced computing products.

Government's Case Closed

In the wake of last week's guilty pleas, the federal government's case against Hitachi is now effectively closed. Other facets of the IBM-Japanese industrial espionage drama, however, still appear to be a long way from legal resolution.

Hitachi's decision to admit its criminal wrongdoing and thus avoid a potentially long and costly trial is expected to have no impact on a parallel case in which Mitsubishi and four of its employees face conspiracy charges. U.S.-vs.-Mitsubishi has been scheduled to go to trial this spring.

Federal prosecutors are also continuing to press their case against nine additional Hitachi employees, all of whom live in Japan where they have remained beyond the reach of American law. The nine employees have consistently ignored government requests to appear in U.S. courts for arraignment.

Another Facet Unresolved

Another facet of the "Japanscam" affair that has yet to be resolved concerns a civil suit that IBM filed several months ago against Hitachi, National Semiconductor Corp. and National Advanced Systems (NAS) Corp. The suit, which would force the defendants to return any stolen IBM trade secrets and would bar them from using the information in their future product designs, shows no signs at this point of being settled out of court.

Also still pending in the Japanscam matter are separate cases involving:

- Iranian student Tabassom Ayazi and two former NAS employees — Raymond Cadet and Dr. Barry Saffaie.
- Hitachi programmer Kunimasa Inoue and Nissei Electronics Ltd. section manager Keizo Shirai.
- NCL Data, Inc. president Tom Yoshida, who is set to go to trial on April 4. Yoshida allegedly acted as a financial middleman between Hitachi and the FBI undercover agents.

The Ayazi-Cadet-Saffaie case was dismissed last fall, but the government later appealed the dismissal. Inoue's and Shirai's case, meanwhile, is scheduled to go to trial at month's end.

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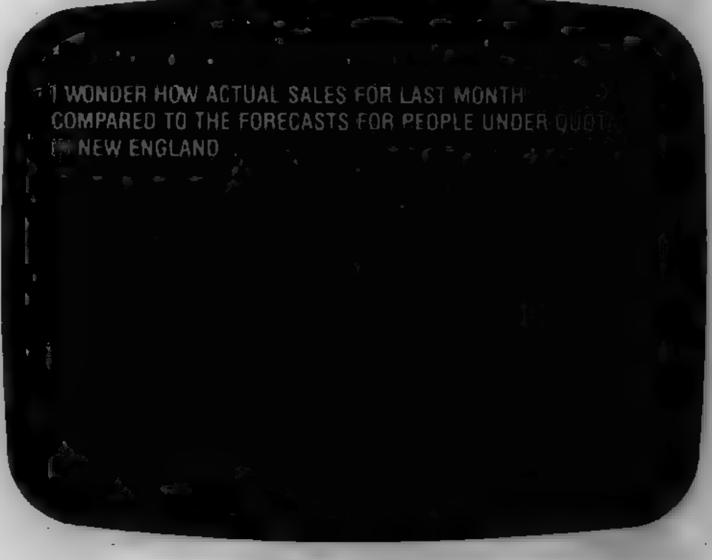

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Poll Finds Service Calls Preferred to Self-Testing

By Marguerite Zientara
CW Staff

Vendors in the computer industry may be promoting self-testing, remote diagnostics and self-maintenance, but users don't necessarily like it.

In a recent informal telephone survey conducted by *Computerworld*, eight users were polled regarding their preferences for machine self-testing vs. field engineer service calls. Of the four DP managers who said they have self-testing functions in their computers, three felt strongly that they would prefer field engineers to machine testing procedures.

Lance Grandone, director of information systems for Vaughan-Jacklin Corp. in Downers Grove, Ill., said he prefers field engineers "mainly because to use these [self-test devices] effectively, the individual needs a tremendous amount of training in the hardware. And we have not made that great step that says we are going to maintain our own computer system.

"I have a maintenance contract and I would just as soon have the people that I pay for that maintenance contract do the work."

Grandone has about 100 diagnostic programs resident on his Hewlett-Packard Co. HP 3000-III. "Those we do use are a great help in pinpointing problem areas," he acknowledged. Others are used only by the field engineer.

User Spotlight

DP Director Phil Berry of the Kansas City, Kan., Public Schools agreed that his maintenance contract should cover him.

"I suppose we could [do the maintenance ourselves], but we just don't want to do that," Berry said. "I just don't feel that's our responsibility. We pay monthly maintenance on the hardware. We might tell them what the problem is, but they must fix it just because of the fact that it's a hardware problem."

Berry is enthusiastic about the remote diagnostic link between his Univac 1100/62 and a central site in Minnesota. "If a nighttime operator has a problem, he can call direct to that number and they can walk him through other paths to circumvent [the problem] if he cannot in fact fix it, which has been a very valuable tool," Berry explained.

When asked about the trend toward self-maintenance, Berry offered, "I'm just too old-fashioned for that. I'm not even interested in that."

One DP director, who has had an IBM 4341 with self-testing and remote diagnostics for 14 months, said he has yet to use the remote diagnostics and generally prefers to have an IBM customer engineer (CE) on-site.

"It has a personal touch; we can talk to somebody and we have a lot of confidence in our CEs here," explained Thomas Householder, DP director at Blue Cross/Blue Shield-Wyoming in Cheyenne. Remote diagnostics would be used "only in a catastrophic situation where the CE couldn't solve the problem."

How do the computer vendors feel about such user reluctance to use state-of-the-art technology? "I think it's really a function of the size of the system you're dealing with and also what the customer has become accustomed to," remarked Gary Nelson, director of market planning for Basic Four Corp. "As you get into large systems, like IBM 370s and 3033s, they're pretty complex architectures. I think if I were an owner of one of those, I'd back away . . . If you look at the micro systems, they're reasonably simple machines. There are not a lot of things inside to deal with, particularly if it's electronic. If it's a mechanical failure, yes, then somebody's got to take a look at it and put the pieces back together on the printer or wherever the problem was."

A Singular Voice

A singular voice in the maintenance chorus is IBM, which denies any trend — at IBM, anyway — toward customer self-maintenance.

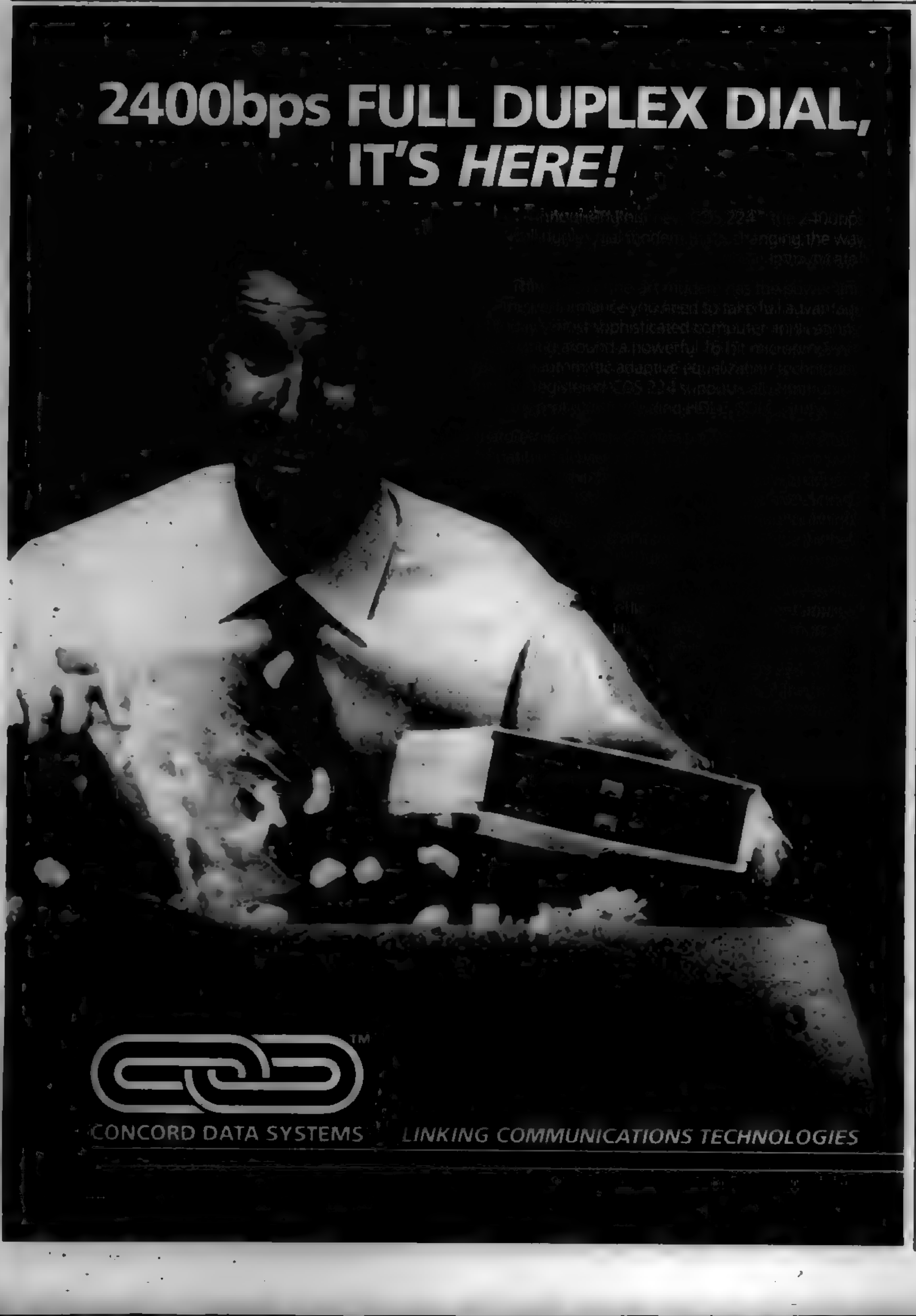
"Remote diagnosis for hardware is usually performed in conjunction with an on-site service person," an IBM spokesman said.

"IBM software support is carried out by the IBM Support Center working with the customer with on-site assistance from an IBM program support representative available to the customer if needed," he added.

Two respondents without self-testing capabilities said they had no desire to have such diagnostics and two others expressed interest in them. "I think it would be an appropriate thing — usable and feasible," observed Connie Browning, operations manager for Kane County Government Center in Geneva, Ill.

"If you knew the problem areas before you brought in a CE, it might hurry up the process or it may even allow you to determine which vendor you needed quicker," she added.

John Goonan, vice-president and DP manager at Sterling National Bank and Trust Co. in New York, said he wished his system did have diagnostics. "We could keep track of the various problems the system had and keep maintenance the way it should be."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Maintenance Seen Complex, Costly Proposition

(Continued from Page 1)

to keep maintenance costs down, and the vendors have therefore become innovative in the choices they offer customers.

An alternative to the vendor-customer relationship is third-party maintenance (Figure 2). These services are typically priced 20% lower than vendor-supplied services. However, "the traditional third-party maintenance organizations will, to a large extent, be relegated to servicing the older equipment a vendor would just as soon ignore," claims another IDC report, "Vendor Strategies for Field Service Operations."

Not so, according to Marvin Venable, vice-president of marketing for Sorbus, Inc., one of the major third-party maintenance firms. "There certainly is an opportunity for third-party maintenance companies to service older equipment, since manufacturers tend to focus their attention on newer products and the users of older equipment suffer," he noted. "But most of our activities involve the latest state-of-the-art micro products like the IBM [Personal Computer], [Apple Computer, Inc.] Apple and Radio Shack equipment."

TRW Corp. Director of Field Operations Maurice Upton agrees. "Certainly with the value-added situation that third-party brings to the marketplace, I feel it's a very viable alternative for the end-user and makes for a very strong and competitive stance as an alternative."

Maintenance By Third Party Going Strong

By Marguerite Zientara
CW Staff

Where do the almost universally acknowledged trends toward self-testing, remote diagnostics and customer self-maintenance leave the third-party maintenance companies?

Still going strong, according to computer vendors, third-party maintenance firms and market researchers interviewed by *Computerworld* last week.

First-time users need someone to fix their machines in spite of the trend toward self-maintenance, Tony Friscia, a senior market analyst for The Yankee Group, explained. "If the primary vendor's not going to do it — and he's not — then it opens the door for third parties."

For new companies that don't have the resources to establish a nationwide service organization, "it's in their best interest to look for deals with companies like [Sorbus, Inc.] or [TRW Corp.] to pick up the maintenance responsibilities for their machines," he added.

Then, of course, there is the problem of all the outdated machines that vendors would rather ignore.

"A lot of people are still using IBM 360s and outdated 370s," Friscia noted. "While IBM doesn't want to hold onto the maintenance responsibility, or at least discourages it, companies like Sorbus make a pretty good amount of money maintaining

(Continued on Page 12)

User Spotlight

Predicasts, Inc.'s manager of high technology research, Neil DiGeronimo, feels likewise. "Many of the new companies can't afford to have a service organization, so people have no choice but to go with third-party maintenance," he explained.

While real growth opportunities for third-party maintenance firms lie in joint agreements with the new microcomputer makers, older equipment will remain a major focus of third-party maintenance firms, observed senior market analyst Tony Friscia of The Yankee Group. "As long as IBM is building new products, that's a pretty big market to be a part of, because IBM makes a hell of a lot of money maintaining computers," Friscia said, pointing out that IBM's service revenues are "in the billions."

If IBM introduces a new 4300 and promotes its use, "they're probably going to discourage people from holding on to those older [computers], and that means they're going to up their maintenance costs. For that reason, companies like Sorbus will have a big chunk of that revenue."

Opportunity for Crime

Remote diagnostics may cut certain costs and allow field engineers to be more prepared when they reach a user site, but they may also provide a perfect opportunity for crime.

Explained Gary Nelson, director of market planning for Basic Four Corp., "If I as a remote engineer can get in and mess with a customer's system out on the East Coast and I can get right down into the guts of the machine based on my remote diagnostic capability, what's to prevent me from also tampering with the files?"

What indeed? "Very little," Nelson said. "If I decide that I want to do that and it happens to be a large bank and I'd like to tweak up my bank account, there's very little in the way of security guards right now, from a remote diagnostic perspective, that would prevent a sharp cookie on one end of the telephone line from doing that."

Time Frame	Annual Salary of Field Engineer	Annual "Cost" of Field Engineer	Value of Computer System per Site
1956	$ 8,800	$12,000 to $15,000	$2,500,000 to $3,000,000
1982	$30,000	$60,000	$30,000

Source: IDC

Figure 1: Field Engineer Cost vs. System Cost

Company	Equipment Serviced
Computer Maintenance & Leasing Corp. 1009 Twelve Oaks Center 15500 Wayzata Blvd. Wayzata, Minn. 55391	Offers "insurance policy" service on all IBM systems using IBM engineers and parts at lower cost
Control Data Corp. Engineering Services 6809 York Ave. S. Edina, Minn. 55435	IBM 30 series
General Electric Co. Apparatus Service Division Schenectady, N.Y. 12345	Terminals, printers, CRTs, telecommunications accessories
Indeserv, Inc. 531 King St. Littleton, Mass. 01460	All types, all major makers
Kalbro Corp. 101 Foster Road Moorestown, N.J. 08057	Predominantly Digital Equipment Corp. CPUs with mixed vendor peripherals
RCA Service Co. Division of RCA Corp. Building 204-2 Rt. 38 Cherry Hill, N.J. 08358	All types, all major makers
Sorbus, Inc. 50 E. Swedesford Road Frazer, Penn. 19355	All types, all major makers
TRW Corp. Customer Service Division 70 New Dutch Lane Fairfield, N.J. 07006	All types, all major makers
Western Union Corp. 1 Lake St. Upper Saddle River, N.J. 07458	Telecommunications, office automation: minis, micros, point of sale, private automatic branch exchange

CW Chart

Figure 2: Major Sources for Third-Party Field Service

	Service Maintenance Quality	Service Support Quality
Most Highly Rated	IBM	IBM
	Basic Four Corp.	Basic Four Corp.
	Microdata Corp.	Microdata Corp.
		Four-Phase Computer Systems, Inc.
Highly Rated	Digital Equipment Corp.	Hewlett-Packard Co.
	Hewlett-Packard Co.	Digital Equipment Corp.
	Four-Phase Computer Systems, Inc.	Prime Computer, Inc.
	SEL	SEL
	Qantel, Inc.	Tandem Computers Corp.
Favorably Rated	NCR Corp.	Honeywell, Inc.
	Sperry Univac	Sperry Univac
	Data General Corp.	Qantel, Inc.
	Tandem Computers Corp.	Wang Laboratories, Inc.
	Honeywell, Inc.	Data General Corp.
	Wang Laboratories, Inc.	Burroughs Corp.
	Burroughs Corp.	Texas Instruments, Inc.
	Prime Computer, Inc.	NCR Corp.
	Texas Instruments, Inc.	
	Perkin-Elmer Corp.	

Source: IDC

Figure 3: User Evalutions of System Suppliers. The result of a survey of 264 users by International Data Corp., these ratings show no direct correlation of user satisfaction to market share and indicate that users generally assess vendors' services 'with some care,' according to IDC.

User-Maintenance Alternatives Abound

While there is no one "best" maintenance technique or service strategy, there are a number of alternatives ranging from simple board swapping to customer self-maintenance. The following is a list compiled by International Data Corp. of Framingham, Mass., in a recent report:

- *Board Swapping*. Probably the primary service strategy for most companies over the last four or five years, board swapping does not call on field engineers to fix systems and peripherals on-site. "What they do is get them back on the air as quickly as possible," IDC explained.

A field engineer typically will be dispatched with enough information on the fault so that he arrives with a complement of boards to swap in and out with the existing boards.

Diagnostic routines, either built-in, remote or exercised by a device carried by the engineer, fault-find to the board level, allowing this technique to be implemented successfully.

Two forces have made board swapping popular: the need to fix quickly computer systems that are increasingly integral to a company's functioning and a dearth of high-level, military-trained engineers due to a voluntary army, according to IDC's report.

"With lower skilled individuals," IDC pointed out, "companies by default have turned to the board-swapping strategy, recognizing that a lesser skilled individual can unplug a series of boards, plug new ones in and see if the equipment will work."

- *Depot Repair Centers*. These are facilities that repair faulty printed-circuit boards, refurbish equipment or peripherals that have come back from rental or lease, warehouse parts and provide many of the functions that a manufacturing/warehouse operation provides.

(Continued on Page 12)

Third-Party Maintenance Firms Going Strong

(Continued from Page 11)

those older machines."

The increased use of remote diagnostics will not necessarily hurt third-party maintenance vendors, said Neil DiGeronimo, manager of high-technology research for Predicasts, Inc. "If [third-party vendors] had to do maintenance for a large computer system like a superminicomputer, they would probably have to have a computer somewhere and provide remote diagnostic capabilities because the systems are just too complex.

"On the smaller units, like a microcomputer, it's probably not required," he observed, "since the number of boards is so small anyway that remote diagnostics probably wouldn't affect it."

In its report, "Vendor Strategies for Field Service Organizations," International Data Corp. maintained that remote diagnostics "provide efficiencies to the hardware vendor service organization but require considerable investment to duplicate for a third-party service organization." However, Sorbus' vice-president of marketing, Marvin Venable, disagreed with that point. "They're assuming that the vendor can perhaps design-in certain characteristics and features into the hardware that might not be usable by a third-party maintenance company," he said. "We haven't found that to be true."

Third-party maintenance firms already offer remote diagnostics to a certain extent, he noted, pointing out that Sorbus employs remote diagnostics on products such as the IBM 4300 series that are similar to those offered by IBM.

Maurice Upton, director of field operations for TRW, contended that with most of today's systems, remote diagnostics do not play that great a role. "It is very good from a marketing hype standpoint," he remarked. But "if you're in a communications environment and there's something wrong with the system that eliminates the ability to communicate with the system, then you can't load diagnostics to run diagnostics through the communications link," he explained.

"If you can't get into the system, you sure can't run diagnostics," Upton said.

Computer vendors, too, see the third-party maintenance market thriving, although in an evolutionary way.

"Third-party maintenance companies are branching out into other types of service than what you would traditionally have," according to Gary Nelson, director of market planning for Basic Four Corp. Sorbus, for example, Basic Four's sister company, "is not only doing the traditional maintenance you've seen over the last 10 years, but they're also providing depot service for carry-ins and personal computers."

Sorbus "recognizes that as remote diagnostics become successful, they have to find other ways of making money," Nelson added. "I don't really see remote diagnostics taking over that lion's share in the near term. It's going to be an evolutionary type thing over the next 10 years."

Service Strategies Abound

(Continued from Page 11)

Operating at a lower level than major repair centers, depots have sprung from three major impulses: a desire to improve service productivity by using specialists and benefiting from volume work, cutting down on the "float" of spare boards in the repair pipeline by locating centers regionally and reducing travel time.

• *Built-In and Remote Diagnostics.* Diagnostics can now be found in the product/system itself, at a remote facility, on a specific printed-circuit board and more recently on integrated circuits (see figure below).

The diagnostics many companies are now providing to customers include power-on self-test, customer- and field-engineer-invoked routines and remote diagnostics.

• *Maintenance Devices.* For several years, service technicians have used a variety of sophisticated and expensive test instruments, the use of which indicates "a major commitment on the part of a company's engineering, manufacturing and field service organizations," IDC noted.

Some commonly used devices are oscilloscopes, digital multimeters, signature analyzers, test exercisers, data and logic analyzers and module and data communications testers.

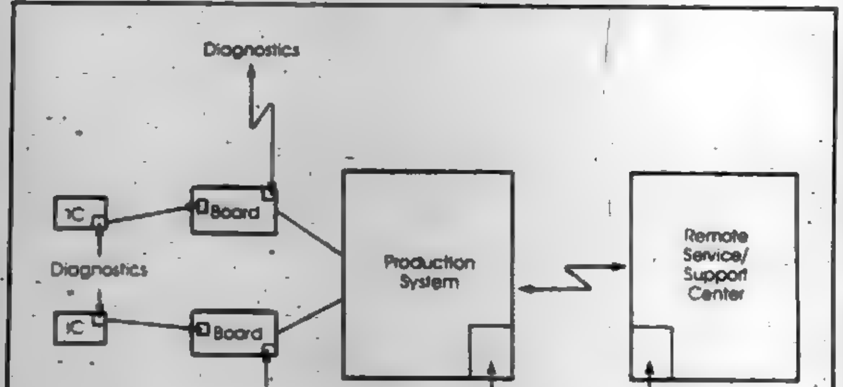
The devices are said to reduce repair time, require lower level engineers, reduce the number of "casual calls" and minimize much of the human error that usually exists in maintenance analysis procedures, although an engineer can override a prescribed repair routine.

• *Customer Self-Maintenance.* The "very interesting" and very recent phenomenon of customer self-maintenance has grown out of two situations. "In some cases, this is a response to customer requests for alternative service plans with lower costs," IDC reported.

"Just about all" the 20 firms in the computer, terminals, data communications and test equipment industries interviewed by IDC indicated they were already providing or considering various options for customer maintenance.

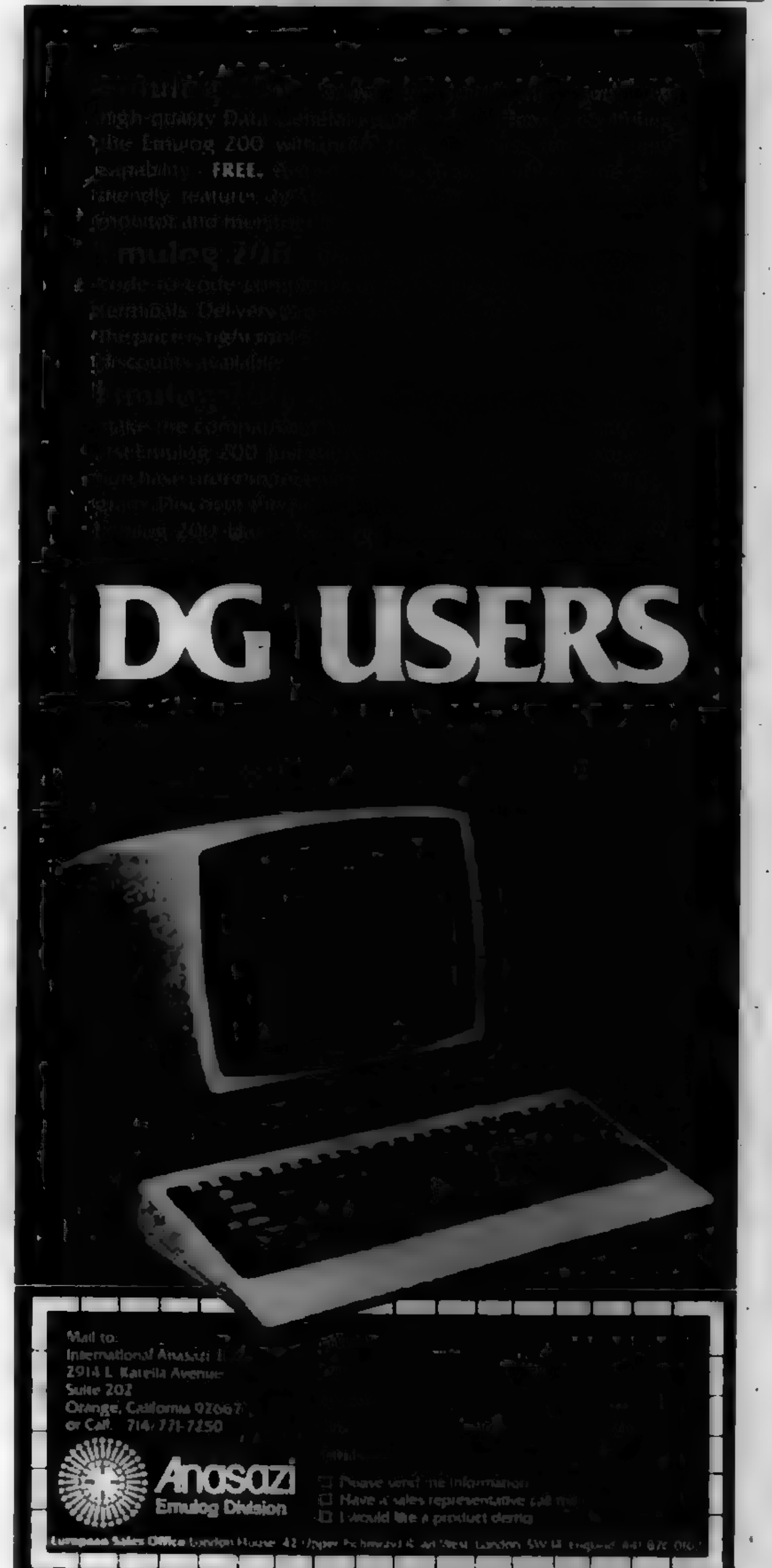
In this category, customers take responsibility for returning faulty components, modules or peripherals to repair facilities, either by mail-in or pickup and delivery service.

"How far could this trend extend?" IDC asked. "One possibility . . . is that as prices of peripheral devices and key components continue to decline, we could reach the stage where it is cheaper to throw the product away than have it repaired," the report theorized.



IDC Chart

Diagnostics: Where They Are Found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Datacomm Briefs

MCI Increases Capacity Of Transmissions by 50%

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — "The largest purchase of satellite transponder capacity in telecommunications history" was announced here by MCI Communications Corp. earlier this month. Comprising 48,000 circuits, it will increase the carrier's transmission capacity by nearly 50% and "provide us with the lowest cost per circuit of any satellite transmission system," MCI Chairman William McGowan said.

MCI said it expects to begin loading the new circuits in September 1984 when, under the terms of the U.S. vs. AT&T antitrust settlement, the divested Bell operating companies must begin providing specialized carriers with access equivalent to that offered by AT&T's Long Lines Division. That will make MCI services available to users with rotary-dial telephones, who comprise about 60% of all telephone customers.

The new circuits are to be leased from Hughes Communications, Inc., which plans to launch the first of three Galaxy satellites next September. They will communicate with earth stations in New York, Chicago, Los Angeles, Dallas, Seattle, San Francisco and Atlanta.

Baby Bell Offers Clients $200 Million in Financing

NEW YORK — American Bell, Inc. is making $200 million worth of financing available to its customers this year under an agreement recently negotiated with a subsidiary of the Chase Manhattan Bank. However, Chase's rate of interest was not disclosed.

American Bell customers can use the financing to pay for the purchase and installation of modems, data terminals, telephones and most of the other voice and data equipment offered by the AT&T subsidiary. The only major exceptions are private branch exchange central switching and control units, which are leased rather than sold by American Bell.

Charles Marshall, president of American Bell, said the financing will make his company more competitive. Independent suppliers have offered such arrangements for years.

Justice, GTE Urge Limits On Long Lines Division

WASHINGTON, D.C. — The Federal Communications Commission (FCC) should not allow AT&T's Long Lines Division to provide terminal equipment on an unrestricted basis to federal agencies that deal with military security and civil emergencies, the U.S. Justice Department and GTE Service Corp. said recently. They were upset by a petition from AT&T asking the commission to waive a provision of its Second Computer Inquiry Decision, which requires the phone company to market terminal equipment only through a separate, deregulated subsidiary.

GTE and Justice will go along with a waiver of this provision, but only if it is limited to specific military and emergency preparedness systems and is made subject to FCC oversight.

Appeals Court Upholds Litton-AT&T Decision

NEW YORK — By denying interconnection rights to Litton Industries, Inc., AT&T violated the Sherman Act, the U.S. Court of Appeals here said early this month, agreeing with a lower court. AT&T plans to appeal that ruling to the Supreme Court.

However, as things stand now, the phone company is obligated to pay Litton $276.6 million in damages.

Last month, a federal appeals court upheld a lower court verdict against AT&T in an antitrust case brought by MCI Communications Corp. But in another case, filed by Southern Pacific Communications Corp., AT&T was found not guilty by U.S. District Judge Charles Richey. Both of these decisions are also being appealed by the losers.

FCCer to Call for Inquiry Into AT&T Regulation

WASHINGTON, D.C. — How much AT&T should be regulated after divestiture should be considered by the Federal Communications Commission (FCC) as soon as possible, Commissioner Anne P. Jones said here last week at the annual conference of the Computer and Communications Industry Association, a trade group representing vendors of intelligent terminals and smart network services.

Jones said she intends to recommend a commission inquiry into this matter and indicated that since FCC Chairman Mark Fowler and the chief of the commission's Common Carrier Bureau have endorsed the idea, it probably will be adopted.

Jones also predicted that the commission would shortly reconsider whether the Second Computer Inquiry Decision covers international as well as domestic services. In addition, Jones indicated that the commission should look into allegations that AT&T's proposed Basic Packet Switching Service violates "the spirit of the Computer II separate subsidiary requirement."

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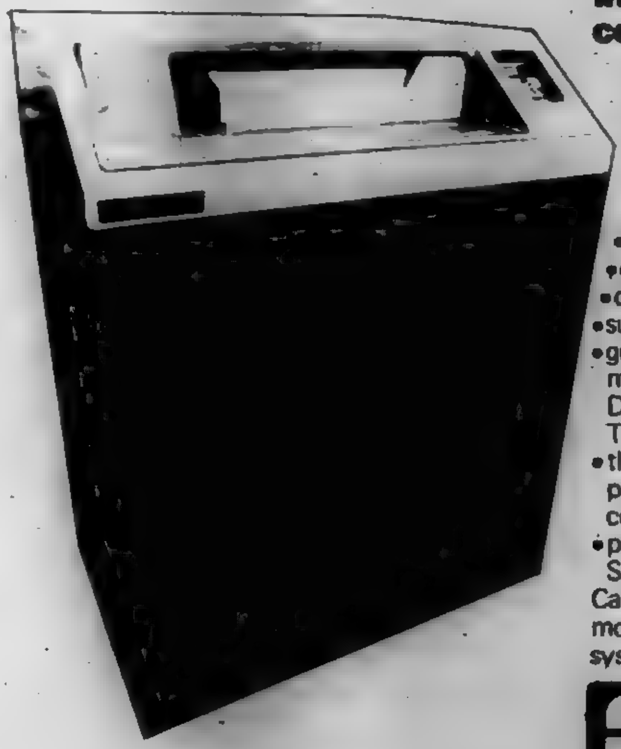

Replaced by Automation

Programmer Extinction Predicted

By Lois Paul
CW Staff

AMELIA ISLAND, Fla. — Programmers represent a bottleneck that must be eliminated by automating the programming function.

Thomas M. Nies, president of Cincom Systems, Inc., conveyed that message to attendees of "Direction: 1987 Strategy Workshop for Information Management Success," sponsored by Cincom here last week.

Nies admitted that his is not a popular suggestion among his friends who are programmers. He maintained, however, that "we know it does the company no good to have a three-year backlog" and users who are dissatisfied because everything they want to do must go through programmers. He said his company's goal, therefore, is to eliminate eventually the programming function.

Subtle, But Clear Message

The fact that users are buying microcomputers and packaged solutions to fill their needs is a subtle but clear indication that DP has failed, Nies said. However, he warned that micros and packages may aggravate rather than solve the solution unless they are part of an overall plan. "You have to get the concepts right and then apply the right products to the concepts," he cautioned.

Citing the growing backlog, high maintenance costs and increasing complexity of applications at DP sites, Nies maintained that the answer to most application software products is the right systems software. However, most of these major products represent very old technology, having been introduced in the '60s and early '70s.

"I would say that the No. 1 problem of applications programming today is that Cobol is used for 90% of applications and Cobol was developed in 1959," he said. Although the language is "hopelessly obsolete," many DP installations stay with it because so much of their resources are involved with it.

Many people believe that with memory so cheap, it is possible to have bigger programs, Nies said. "As it turns out, it is programmer productivity, not memory size, that is the problem. Actually what we want are small models that are quicker and easier to build and maintain."

Many data base promoters have claimed that this is a method to decrease application costs, when actually it costs more to implement programs under a data base, according to Nies. "You go to a data base to control and integrate data better," he said, "not to reduce cost." Myths such as this one that are proffered by "technocrats" are the reason many DP directors "go down the tubes." Rather than make the technological leap to a data base to reduce costs, Nies suggested that DP managers invest a smaller amount in an application development system that can provide a quicker return to be invested in a more costly data base system.

What DP managers need to find are ways to move more of the design and development into the design stage, at the lowest cost factor on the curve, using prototyping to learn everything about the application at the beginning of the design phase. He said the current system of manually writing down user requirements and having the users sign them is merely a way of justifying the later failure of DP to meet those requirements.

"Companies are making enormous investments to build systems that users don't want," Nies said. "That may have been OK in the '60s and '70s, but more and more directors in large-scale corporations are being replaced by people who came from outside DP" for just these reasons.

CW Photo by L. Paul

Thomas M. Nies

Cause Elects Three To Directors' Board

BOULDER, Colo. — Cause, a professional association for development, use and management of information systems in higher education, has announced the election of three people to its board of directors.

Elected to three-year terms by member representatives were: John A. Monnier, assistant vice-president for administrative services and comptroller at the University of Arizona, James I. Penrod, vice-president for systems and planning at Pepperdine University and Martin B. Solomon Jr., director of academic computing at Ohio State University.

Cause is located at 737 29th St., Boulder, Colo. 80303.

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HEWLETT PACKARD

Prototyping Hailed as User-Tailored Approach

CW Photo by L. Paul

Merle Parks

By Lois Paul
CW Staff

AMELIA ISLAND, Fla. — Prototyping as a means of developing applications is one way of breaking down the wall that has grown up between the application user and the application programmer, Merle Parks, product manager for Cincom Systems, Inc.'s Mantis, said here last week.

Parks told attendees at the firm's "Direction: 1987 Stategy Workshop for Information Management Success" that they must learn to recognize three myths:

- Users know what they want.
- Users can communicate their needs to DP.
- Users' needs are static.

System life-cycle methodologies have not effectively surmounted these problems, Parks said. They include lengthy written requirements and attempts to freeze user requirements, coupled with the use of programmer productivity tools that have largely aided the coding end of the cycle rather than the design phase, which is the real bottleneck.

To get a clear indication of the failure of most systems designed in this fashion to meet user needs, one need only track maintenance requests the week after a system goes into production, Parks suggested. Users generally ask for more than they need in systems but yet do not fully cover their true requirements, Parks said.

At the same time, he noted, DP changes those requirements along the way, eventually developing a system much different from the one envisioned by the end users.

Some DP professionals began in past years to show users mock-ups of reports on which they could base relevant changes. "We didn't know this was prototyping," Parks said. The whole point of this type of procedure is to change the feedback loop by getting user changes during the more flexible early stages of the development cycle, rather than as fixes after a system goes into production.

Resistance to Prototyping

Resistance to prototyping can be traced to several factors, according to Parks. The first is that programmers often feel they have surmounted enormous odds just to get the system running. In addition, the right tools for quick screen design have been absent in the past. Third, "who is going to tell programmers to throw it all away and start over" when they have come up with a design?, Parks asked.

"Creating an application is like putting together a puzzle," Parks said. With the prototyping approach, the designer is more flexible, not feeling he must have all the "edge pieces" in place before beginning work on the next section. Rather than the standard cycle of requirements, design, coding and testing, a prototyping approach can involve user manuals and menus, screens and files, transactions and step-level refinement and then freezing of specifications.

DP as a relatively new industry can benefit by looking at the procedures of older industries such as construction, Parks continued. He likened the flexibility of prototyping to contracting with a builder for a custom house. The potential home owner works with the builder to design the house's major features, leaving more peripheral items such as hot-water taps to industry standards. The builder draws plans and consults with the home owner. During the initial phases, while the framework is being put in place, it is inexpensive to move a wall to accommodate a large piece of furniture. Once the house is completed, however, the only feasible alternative is to buy a new piece of furniture.

Take Samples

"The next extension of where we need to go with DP is to take users samples," Parks said. Similar to the carpet salesman showing different styles and colors of rugs, the system developer could show the user several types of systems via menus that would demonstrate basically how they work.

"That makes it much easier for the end user to recognize what he wants and how he wants it," he added.

This could eliminate problems that sometimes occur when the screen-oriented on-line system basically mimics a paper form that, for example, would be filled out with information taken over the telephone. Logically, the user may want to fill in name and address, but the cursor may move from name to age.

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Fully Integrated Systems Seen Wave of Future

By Lois Paul
CW Staff

AMELIA ISLAND, Fla. — Applications software packages have come a long way, but they still have a way to go, Eric Lange believes.

While "canned solutions" have provided users with a cost-effective head start in meeting their DP needs, they often require changes, and this is when trouble occurs, the product manager for Cincom Systems, Inc.'s Manufacturing Resource Planning System said here last week.

To complicate matters, vendors have difficulty supporting and providing updates to modified code, as well as documenting these changes. "What we want are fully integrated systems. What we don't want is disintegrated systems," Lange told attendees at Cincom's "Direction: 1987 Strategy Workshop for Information Management Success."

The only way to achieve this, he said, is through "integrated information." He predicted that applications of the future will be vendor developed and will be able to integrate application components that will be implemented by users using the next generation of technology.

The tendency will be for vendors to develop smaller application components based on the needs of various industries, he continued. "They are kernels of logic, and users can extend the functionality. The intent is to provide a cost-effective head start."

The application components will be implemented by people Lange described as "application engineers" who come from the end-user rather than DP community. These application engineers will implement the code and extend it using tools such as decision support systems. In conjunction with this, the need for programmers will decline and the need for systems designers increase.

Lange predicted the emergence of these user-oriented implementation/application engineers toward 1987. These people will use next-generation technologies to take the application functions across the hardware and software components that make up their DP network.

"There will be a greater sense that information is a resource but that it has a price," Lange said. Management information systems directors, therefore, will try to determine the financial aspects of systems before they step into them. Prototyping tools will assist these directors in early justification of the costs of development efforts. The first decision in business when considering new technologies, he suggested, should be, "What are they going to buy us?"

CW Photo by L. Paul

Eric Lange

Faster DP Pace Vital: Economist

By Lois Paul
CW Staff

AMELIA ISLAND, Fla. — A much faster pace of automation and computer technology is the major and perhaps only hope for U.S. industries that want to compete in the world market during the difficult economic times that lie ahead, an economist warned here last week.

Although the unemployment rate cannot be reduced by trying to rebuild the steel and automobile industries, we can try to rebuild these industries with high technology such as robotics, Dr. Michael K. Evans told attendees at Cincom Systems, Inc.'s "Direction: 1987 Strategy Workshop for Information Management Success."

"The way we are going, the Japanese are going to beat us at that also," he said.

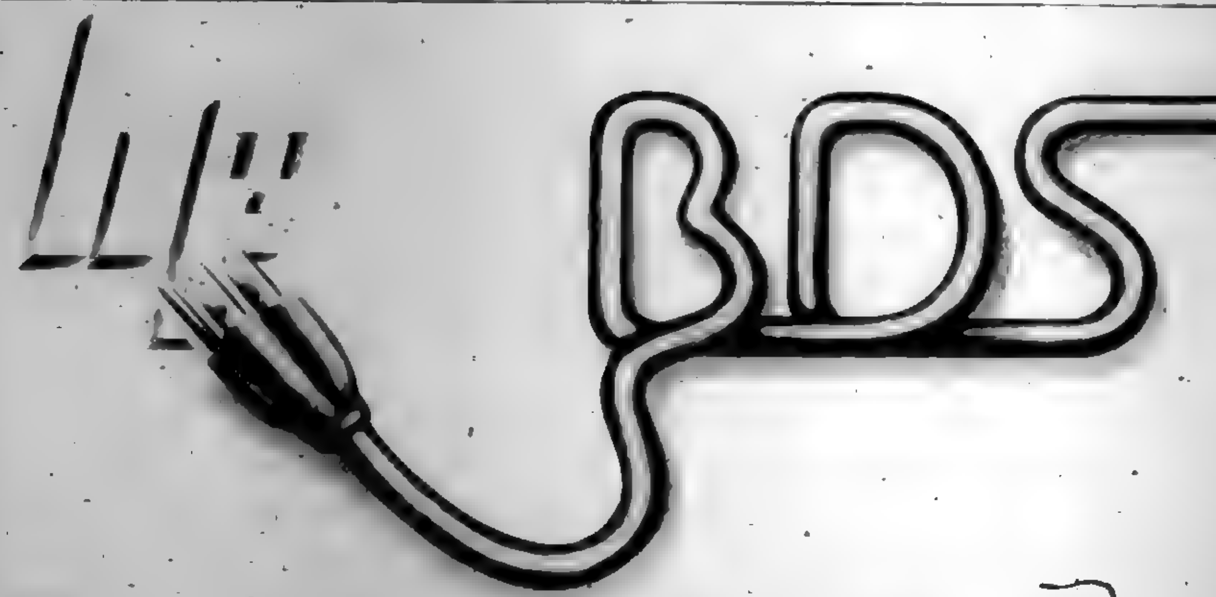
Moreover, the old jobs are not going to come back, Evans said of layoffs in industries such as steel. Although all workers cannot be retrained, at least the younger ones can be educated in information-processing-related jobs.

Feeling the Recession

Evans, president of Washington, D.C.-based Evans Economics, Inc., cautioned that the once-sacrosanct DP department is now feeling the recession's effects. "In the last six months, there have been wholesale layoffs of DP people," he noted.

Greater profits will be made in 1987, he suggested, by those who provide selective information, not more information. Management is beginning to ask if the deluge of information provided by DP is really helping to improve planning, productivity or profits.

"We need systems that will provide more selective information. I think this is going to be one of the challenges of the DP industry to provide this," Evans said.



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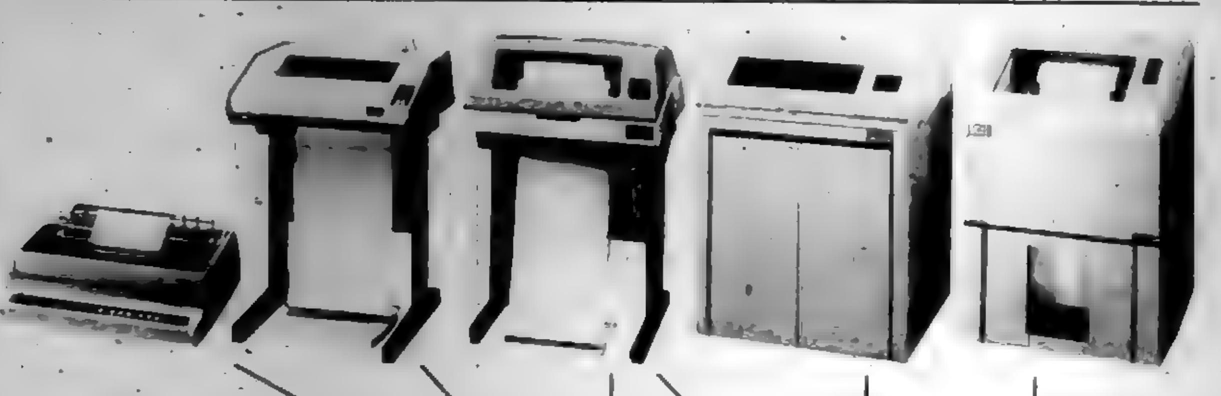

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BAI Plans Bank DP Auditing Certification

By Patricia Keefe
CW Staff

ROLLING MEADOWS, Ill. — The Bank Administration Institute (BAI) has announced a professional certificate/educational program in bank DP auditing. The program was prompted by changing bank operations, coupled with the fact that DP is "significantly affecting many key banking professions," a spokeswoman for BAI said.

The certificate curriculum consists of BAI's established five-day introductory and intermediate courses in DP bank auditing, interspersed with two home-study case problems and culminating in a new five-day advanced course.

The program is overseen by a BAI DP advisory committee made up of practicing DP bank auditors. Courses are taught by industry professionals and independent consultants in DP auditing. Courses, tests and case problems reportedly will be updated periodically.

Auditors with some DP experience may take a proficiency test in lieu of the introductory course. Auditors who have taken the introductory or intermediate course prior to November 1980 can enter the program at their current levels. All participants must complete the two case problems, according to the spokeswoman.

The EDP Auditors Association offers a program called the Certificate in Information Systems Auditing, but that organization's associate chairman, John Van Borssum of Security Pacific National Bank, saw merit in having a separate certification program geared toward bank DP auditors.

Specialized Applications

"Normal business applications are specialized in the banking environment," Van Borssum noted.

The BAI program "is not comparable to the Certified Public Accounting exam or anything like that," a BAI spokeswoman said. "We are not trying to deceive people. This is a practical, educational, entry-level program." A manager with 10 years' experience probably would not need this program, she added.

The course is divided into three sections, the first of which starts with general DP concepts and applications systems, takes the student through system development at the intermediate level and covers data communications networks and data bases in the advance course

The introductory, intermediate and advanced courses are each held four times annually at various locations nationwide. The fee for each course is $750 for BAI members, $1,125 for others, according to the spokeswoman.

More information on the certification program is available from BAI, 60 Gould Center, Rolling Meadows, Ill. 60008.

Managers On the Move

VINCENT P. HOWARD has been promoted to vice-president of management information systems for Fox-Stanley Photo Products, Inc. in San Antonio, Texas.

Prior to his promotion, he served as manager of corporate systems development. Before that, Howard was director of management information systems at TSC Industries, Inc.,

Howard holds a B.S. in accounting from Northeastern University and an MBA from Suffolk University in Boston.

•••

WILLIAM J. SPRAGUE has been named director of planning and information resources for Pitney Bowes Inc.'s management information system division.

He will be responsible for the division's strategic planning, data base administration and computer user-support activities.

Sprague, who joined Pitney Bowes in 1964 as a systems analyst, has held several managerial postions within information systems. Prior to his new appointment, he served as a manager of advanced systems planning.

Sprague holds a B.S. degree in business administration from Lehigh University in Bethlehem, Pa.

•••

ANDREW GEGOR JR. has been promoted to the newly created position of manager of management information systems for McCormick Properties, Inc. in Hunt Valley, Md.

Prior to his recent promotion, Gegor served as accounting manager and before that was financial planner.

Before transferring to McCormick Properties, Gegor was corporate financial analyst for the parent company, McCormick & Co., Inc., which he joined in 1975.

Gegor also worked in accounting and budgeting analysis for the Equitable Trust Co. in Baltimore.

Gegor graduated from the University of Maryland with a B.S. degree in financial management and accounting.

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Hewlett-Packard (HP 3000—COBOL II with IMAGE):
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Data General (all models): ☐ Accounting

MIS Pros See Increase in DP Activity, Upheaval

By Robert Batt

CW West Coast Bureau

Several West Coast management information systems (MIS) professionals are anticipating a significant upturn in data processing activity over the next few months — but this may not turn out to be good news. Forced to hold down DP salaries or shelve projects because of lack of funds during 1982, they could be in for a period of upheaval, industry observers recently noted.

"We estimate that within the next nine to 12 months, as the economy turns around, more movement will take place in the MIS community. This movement will concentrate in the manager, project manager and project leader levels and will cause a significant amount of organizational discord," asserted Victor Janulaitis, president of Positive Support Review, Inc, a management consultant firm in Malibu, Calif.

At Western Airlines, Inc., for example, the improving economy could cause severe manpower problems. "There is going to be a heavily churning labor market in Southern California over the next 12 months," said Marv Rich, the airline's vice-president of information systems. "There has been a pent-up demand for DP personnel in areas such as aerospace, the airline industry and financial services which has been held in by the recession.

"Frankly, I am scared to death about what is going to happen in the second and third quarters," Rich admitted. "Many of the people here have not had a salary raise for two years and when the headhunters start going crazy, as they will, I feel we could be in big trouble."

Rich is now pressing Western Airlines to allow company MIS salary grades, which have traditonally been below the industry average, to be calculated outside the company's normal salary structure. Turnover is currently a very low 5%, but Rich suspects "there is going to be a lot of competition for DP people, and it's going to be tough for the MIS guy to maintain his staff."

A number of firms in Southern California have significantly reduced their DP activities over the last year. The oil supply firms, for example, have reduced their systems and programming staffs by 50%. Some firms in this position expect that as a more mobile market emerges, they may lose key personnel.

Firing Line

"As salary review time comes around and people do not get increases that meet their expectations, they are going to start looking around for jobs. We are trying to retain key individuals, but we are concerned that we may lose some," said Dan Burtt, director of information systems at Smith Tool, a subsidiary of Smith International, Inc, which supplies drilling bits to the oil industry.

In addition to holding down salary levels, DP projects in the oil services industry have been postponed or cancelled during the recession. This means that highly qualified personnel such as project leaders and systems programmers are feeling disgruntled and searching for new opportunities, Burtt said.

Al Jerumanis, director of corporate data processing at MCA, Inc., sees a flight by disgruntled DPers into contracting services once the economy begins to pick up. "Some companies are going to start filling senior MIS positions. While the health and well-being of the organization you are working for will be a factor in whether you stay, the trigger really is, how green is the grass across the street," he pointed out.

Companies relatively unaffected by the recession will look to short-term contracting services to see them over any shortfall of personnel, industry pundits say, thereby adding to the attraction of that career path for certain DPers and increasing employee mobility. As Jim Brown, vice-president of data processing at American Honda, Inc., put it, "We are seeking new talent, but while you are trying to staff up you need to make a strategic analysis of each project. Where it needs to be realized in a short time, using contract services is often the most beneficial way of meeting your objective."

CDP Prep Course Set in Bay Area

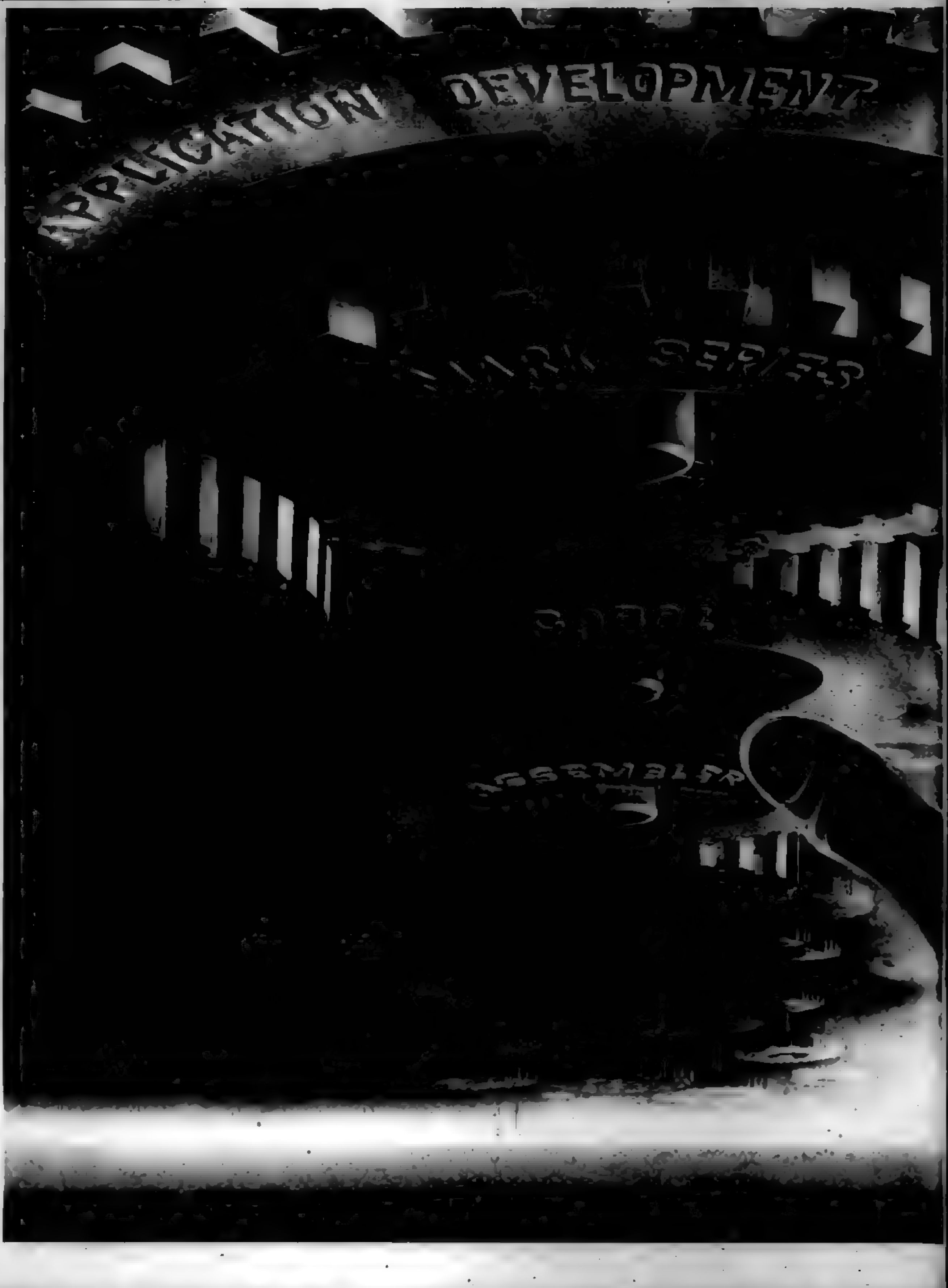
SAN FRANCISCO — Golden Gate University will cosponsor preparation classes for the national Certificate in Data Processing (CDP) examination on alternate Saturdays through April 23.

The CDP is awarded by the Institute for Certification of Computer Professionals. The yearly national exam will be offered in the Bay Area on May 7.

Classes meet from 9 a.m. to 3:30 p.m. on the university's main campus at 536 Mission St. here.

Attendees may register for the entire program for $300, for individual sessions for $60 or for the practice exam only for $30, according to the school.

More information is available from the Center for Professional Development, Golden Gate University, 536 Mission St., San Francisco, Calif. 94105.



Global Crime Reports Increasing

Multinational Firms Warned on DP Security

By Bob Johnson
CW New York Bureau

NEW YORK — Increasing numbers of reports of computer-related crime on the international scene mean that U.S. companies with foreign interests must become aware of their vulnerabilities, a computer security expert emphasized in an interview here recently.

Rolf Moulton, director of the New York Department of Investigation's Computer Security Services Unit, pointed to documents his office recently received from the Japanese Information Processing Development Center in Tokyo on two cases of computer abuse there. "One recent case report from Japan told of two people who, according to the indictment against them, misused a bank's online system to obtain fraudulently a total of 130 million yen in cash and guaranteed checks. This was said to be the first major misuse of a computer to commit a crime of fraud against a bank in Japan," Moulton noted.

"The Japanese are serious about deferring computer abuse and the sentences imposed were a lot more than just slaps on the wrists," Moulton said. He noted that the judge on the case handed down "real" prison sentences of 2½ years and five years.

However, he said, the case is an example of the scope of computer crime occurring internationally. According to the case report, the Japanese judge said. " 'This was a bold, clever, premeditated crime that took advantage of computer weaknesses. It had a tremendous effect on society from the standpoint of making people lose faith in the computer systems that the modern world has come to rely on so heavily.' "

Moulton also pointed to a 1981 British computer-fraud survey done by the Auditors Inspectorate of the Department of the Environment. The survey, which contacted 319 organizations, reported 67 "computer-related abuses." Of these 67 abuses, 42 of them, or 63%, involved data input manipulation at the supervisory level that resulted in 95% of the dollar losses suffered by the study's businesses.

In contrast, only 22 of the crimes were "resource-related" — thefts or misuse of computers or computer resources.

While Moulton admitted that such a limited study cannot accurately gauge an entire nation's situation, he said it is another indicator for American business to study if they are contemplating business overseas. The study showed most abuse was connected with company "payable" systems, a crucial area of concern when doing business.

Management's Responsibility

The English study stressed that it is management's responsibility to detect and deter this kind of fraud, according to Moulton, who said he completely agrees with that philosophy. He maintained that domestic computer security officers are the ones directly responsible for realizing the potential for international computer abuse, and they must make their company's management aware as well.

"Trust in the integrity and availability of computer systems is absolutely essential to society as a whole. Large multinational corporations need to adopt international security measures in order to sustain this order and data security," Moulton said.

The data security officer is faced with a difficult task, however. "Sometimes it is difficult to communicate and install security measures within a company itself, considering different internal organizations and how they do things. Imagine how much tougher it is to deal with other countries," he said.

People assigned to this area must be "proactive" — they have to go out and actively prevent problems, offering cost-justifiable solutions. "Setting up data contol systems in other countries for the transport of data flow is an essential part of security action, as is the consideration of privacy regulations," he said.

"Security officers have to take all of the measures they would normally take in securing a domestic company, plus they have to learn other countries' laws and how they do business. This will be even more important as the responsiveness to international trade increases," Moulton said.

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Directory to Catalog Software Consultants

HIGHLAND PARK, Ill. — J. Dick & Co. plans to publish a list of *Leading Consultants in Computer Software & Programming* in June. Tentatively priced at $39.50, the directory will include software consultants' names, their specialities, operating experience and professional background.

In addition, the directory will include a key word index which provides users with a cross-reference to more than 1,500 specific technical headings, a J. Dick spokesman said.

J. Dick & Co. is located at 500 Hyacinth Place, Highland Park, Ill. 60035.

Exec Outlines 'Time-Wasters,' Suggests Ways to Avoid Them

By Susan Blakeney
CW Staff

BOSTON — If you don't have time to do it right, when will you have time to do it over?

That was the message from Dr. Alec MacKenzie, president of Alec MacKenzie and Associates, Inc. in Greenwich, N.Y., when he addressed the luncheon assembly of the 1983 Prime User Group East User Conference here recently. Speaking on "Making Time Productive," MacKenzie provided his listeners with a profile of "time-wasters" in the office, along with ways to beat the "time trap" and save up to two hours a day.

In order of their rank by managers worldwide, MacKenzie said the all-time, top 10 time-wasters are telephone interruptions, crisis management, inadequate planning/objectives, visitors, ineffective delegation, attempts to do too much, meetings, personal disorganization, the inability to say "no" and lack of self-discipline.

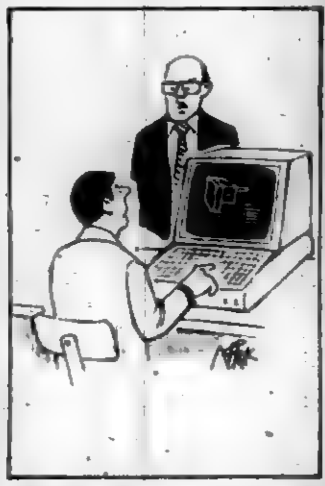
Other office hurdles included procrastination and indecision, inadequate staff, red tape and paperwork, poor communication, confused responsibility, socializing and training.

When MacKenzie's comment on visitor interruptions drew many nods of agreement, he polled his audience to find out how many worked in "open" offices or had open-door management policies. More than half of the 200-plus conference-goers raised their hands.

"Isn't it strange how the open-architecture environment and the open-door policy — which were both intended to make managers more accessible — make them less productive and therefore less effective?" MacKenzie commented.

The uninvited person who visits the manager is the person in charge of the manager's time — not the manager, MacKenzie said. To alleviate this and other common time-wasting occurrences, MacKenzie urged his audience to:

- Be aware of the value of time for one's life and job.
- Use and analyze a log to identify time-wasters.
- Understand the concepts of time, productivity, effectiveness, time-wasters and their relation to managing.
- Use principles to identify and solve time-wasters.
- Develop solutions to time-wasters and plans to implement them.
- Identify the mission and role of the secretary.



'Ask It What We're Supposed to Do With the Fifty Electric Pencil Sharpeners We Bought Last Year.'

Uni-Ops Sets March 28 Meet For Unix, C Language Users

SAN FRANCISCO — The second annual Uni-Ops Conference for newer Unix and C language users will be held here March 28-29.

Sponsored by Uni-Ops, a nonprofit organization, the conference has been organized into three categories of activities: general meetings focused on how to exploit this software, birds-of-a-feather luncheons for informal networking and a vendor exhibition featuring Unix systems and software.

Registration costs $65 in advance, $100 at the door. Further details can be obtained from Uni-Ops, P.O. Box 5182, Walnut Creek, Calif. 94596.

Attorney Develops Analysis Tool for Lawyers

By Bob Johnson
CW New York Bureau

NEW YORK — A law school professor who served as a U.S. Justice Department attorney on the U.S. vs. IBM antitrust case is typical of an new type of computer user — a member of "the professions" — who is beginning to create his own systems and software.

Working with legal colleagues at Boise Cascade Corp. and with law students who have an interest in programming, John Soma, a professor at the University of Denver College of Law, has come up with JSAC/2, a second-generation prototype Apple Basic software package designed to help attorneys calculate and predict the outcome of product liability cases. According to Soma, at some point all corporations have litigation situations where their products do not work properly, and the microcomputer is a natural tool for measuring and analyzing what the company might face.

The professor's computer and legal savvy strongly qualify him to become one of this new breed of "user-developer." In addition to working on the IBM case, he did his doctoral thesis on the computer industry at the University of Illinois Center for Advanced Computation, the birthplace of Illiac IV, and authored a book on the computer industry. Another book, *Computer Technology and the Legal Environment*, will be published this spring by McGraw Hill-Shepards.

Soma said in a recent interview that his combination of computer expertise and professional legal experience helped him realize his potential for creating software to aid his profession. As microcomputers become commonplace in legal offices; he believes, the analysis of massive data bases will be done with incredible efficiency.

A "revolution in legal analysis" is at hand, the professor claimed, adding that JSAC/2 is the kind of "pathbreaking" decision-making system needed to assist in this change of the near future.

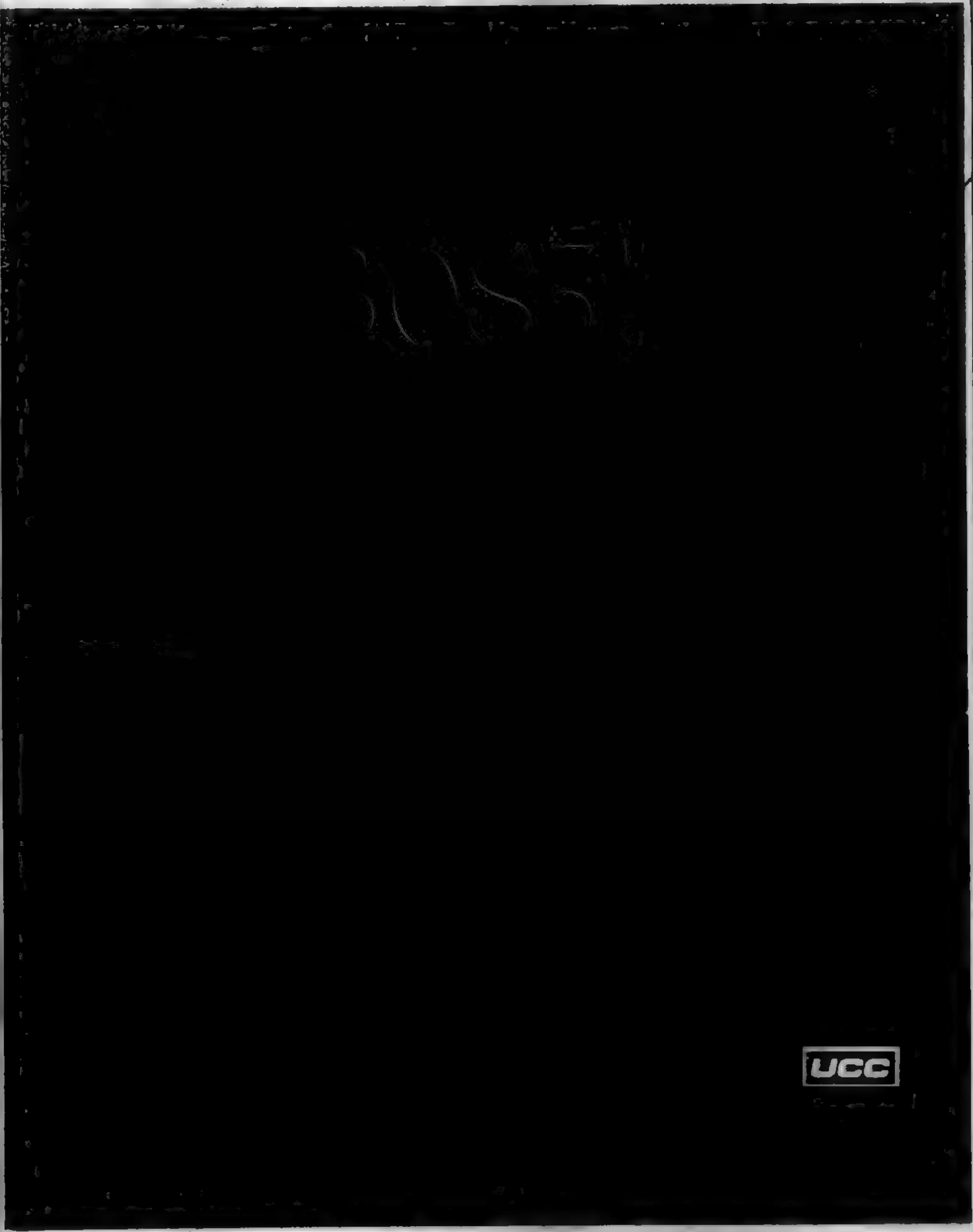
Although Soma believes his system, designed for the Apple II Plus but applicable to most 64K-bit microcomputers, will benefit the legal profession, his understanding of computer technology reminds him that his project is not a legal panacea. "JSAC/2 is intended strictly as a tool to assist attorneys in evaluating resource allocation decisions, so that better decisions can be made about settling cases privately or pursuing them in the courts," he noted.

The development of the software began at Boise Cascade some two or three years ago. The company gave the project some $13,000 in seed money primarily to create a decision making tool, rather than a traditional library/case research aid.

Data was analyzed from 75 product liability cases that were extracted from appellate cases and converted to an empirical data base suitable for validating the logical structure of JSAC/2, Soma said. To gather sufficient data, a questionnaire was sent to 300 practicing attorneys from the Litigation Section of the American Bar Association; 116 attorneys responded, supplying the raw data needed for the JSAC/2 project.

The survey results were subjected to statistical analyses and testing to identify patterns that could be applied to product liability cases. Weights were constructed from the data to form the two modules that make up JSAC/2, and the means and standard deviations of the responses to the survey were used to program it, Soma said.

The software's first module, called Exprob, estimates the probability of success based on an attorney's answers to a series of about 25 product liability case questions. The second module, Inval, asks the user 20 questions related to matters such as costs, preparation, negotiation and trial time requirements. Inval also asks for information regarding probability of appeals, disruption of business, adverse publicity and class action likelihood.



Video Out From Deltak On OA Meet

NAPERVILLE, Ill. — Deltak, Inc. has acquired rights to distribute videotaped highlights of the Office Automation Conference held in Boston last year by CW Communications, Inc.

Titled "Office Automation: The Essential Issues," the conference journal condenses three days of presentations into 2½ hours of viewing. Each tape segment runs under 30 minutes.

Segments offered are "The DP Role in Office Automation," which features Dr. Michael Hammer from MIT; "Planning for Office Automation," featuring Dr. John McQuillan, formerly of the high-technology consulting firm Bolt, Beranek and Newman, Inc., now of McQuillan Consulting; "The Fundamentals of Integration," with Dr. Michael Zisman, president of Integrated Technologies, Inc.; "Some Specifics of Integration," presented by Patricia Seybold, principal editor of the "Seybold Report on Office Systems"; "The Executive Workstation," with Evelyn Wilk of the Management Consulting Division of Arthur Anderson & Co.; "One Company's Experience"; and "Introducing Office Automation to Your Organization."

"Office Automation: The Essential Issues" is available for purchase or rent through Deltak's Deltavision Library. Deltak customers can obtain the videotapes for an average rental price of $50 to $125 per segment per month. Firms without Deltak contracts can purchase each segment at $150 or the entire conference journal for $850. More information is available from 1751 W. Diehl Road, Naperville, Ill. 60566.

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Design Standards Set Out On Cobol, Fortran; Basic

ESTILL SPRINGS, Tenn. — Associated Technology has announced a set of software design standards that are useful in establishing internal programming and documentation practices.

The four-volume reference set covers documentation practices and standards for programming in Cobol, Fortran and Basic.

Designed for software designers and managers and quality assurance departments, the material consists of guides and examples, a spokesman said. The set costs $45 from Associated Technology, Rt. 2, Box 448, Estill Springs, Tenn. 37330.

IMC Offers Introduction To Interactive Graphics

BETHESDA, Md. — The International Information Management Congress (IMC) is distributing a book for users of interactive computer graphics in business and industry.

Called *Introduction to Interactive Graphics*, the book is aimed at current users of interactive graphics users as well as prospective buyers. The book presents an introduction to the equipment, programming, economics and applications of interactive graphics systems, plus information needed to operate interactive graphics systems, the IMC said.

The book is published by John Wiley and Sons and costs $22 ($28 airmail). It may be ordered from the IMC through P.O. Box 34404, Bethesda, Md. 20817.

A TESTIMONIAL FOR THE BURROUGHS B20 FROM SOMEONE WHO SPENT 17 YEARS AT IBM.

Dr. W. LEE SHEVEL
Senior Vice President, Corporate Operations
Burroughs Corporation

Tax Collectors Ease Crunch With CPU, CRTs

ROSEBURG, Ore. — Douglas County tax collectors once dreaded the year-end collection crunch. In five years, their work load jumped 70%. Overtime and weekend work were the only ways of coping with the avalanche of payments sent in by 65,000 accounts.

Now the department completes its tax processing during regular office hours by relying on an IBM 4341 mainframe and IBM 3270 CRT terminals. "We've stabilized at a nine-member staff, handling an average of 3,500 inquiries a month and processing taxes on 65,000 properties a year," reported Mary Cox, county tax collector.

"Automation has eliminated a lot of paper files, assured accuracy, provided faster service to taxpayers and sharply reduced overtime catch-up work," she added.

Taxpayers sometimes visit the tax office to inquire about their accounts or to pay bills. Under the old system, Cox said, "A taxpayer would appear at the counter to settle a bill, then wait while the clerk manually searched records for the amount owed, the number of parcels and the interest, if any, on back taxes."

After the clerk completed these calculations, the results would require further processing before a receipt could be mailed out days later. "The possibilities for errors were quite high," admitted Cox.

Today, however, "taxpayers don't even have to know their account number. Just a name will do. The clerk can press a few buttons on her terminal and have the computer do all the calculations on back taxes and interest. A receipt is printed on the spot and handed to the property owner," Cox explained.

During 1980, more than 9,000 tax payments were printed in this manner, an average of 37 per day. Tax officials considered this feat a huge success in time savings over the manual system.

However, the bulk of the county's taxes are paid by mail rather than over the counter. Cox said the computer enables her department to handle this volume, which has been increasing at the rate of 500 annually.

Tape Exchange

In addition, about 20% of the postings are accomplished by computer tape exchange. Large organizations such as mortgage companies and the Veterans Administration provide tape files to be run on the department's system. This capability saves the tax department an entire week's work, according to Cox.

In the assessor's office the work load has also risen sharply — about 79% over five years. Last October, Douglas County installed terminals in its Reedsport, Ore., offices to serve the growing population in the coastal region, about 100 miles away from the Douglas County offices.

Attorneys, realtors and title companies can now access the computer's property records over phone lines to get publicly available information on taxes, property values and ownership status. Unlike the old method of sifting through microfilm records that were updated only four times per year, the information is current and available immediately.

Douglas County plans to install more terminals in realtors and mortgage offices, which frequently need to refer to the tax rolls, Cox explained.

Elton Szpaller, county director of data processing, concluded. "We plan to provide terminals to heavy users of tax files so they won't have to travel to county offices to use terminals there. It will be a service to the public and help reduce energy consumption."

NO PARKING Between Support Systems

Some people think that because IBM is bigger than Burroughs, they're better than Burroughs. After working for many years at IBM, I can tell you that bigger doesn't necessarily mean better.

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The B20 Series can offer up to five times more memory capacity, can store twice as much data, can have more work stations, offer more kinds of printers, and has a 25% bigger screen (to display more data).

With its powerful 16-bit processor and up to 640K bytes of RAM in each workstation, the Burroughs B20 gives each user his own computer, but with the power, memory and data base that was once associated only with mainframes.

More importantly, the B20 can be networked with other B20's (while sharing the same data base, printer, or mainframe communications), so everyone is always working with the latest, up-to-date information.

And because the B20 supports all four industry-standard languages (COBOL, FORTRAN, Pascal and BASIC), users can select the language best suited to their individual needs. With IBM's Datamaster, you have one choice—BASIC.

In operating systems, the B20 gives you a choice of CP/M® or MS-DOS.™ Or you can choose BTOS, our own operating system, which has more features.

To operate the B20, all you do is open the carton, plug it in,* choose one of our many business software programs (payroll, accounts receivable, inventory control, etc.), and you're in business. (Our step-by-step training manuals are so easy to use, you can be doing sales projections, accounting tasks, or scheduling in a matter of hours.)

If there are any questions, just call the Burroughs hot line. Trained Burroughs computer specialists will help with any problem that arises. (90% of all questions are answered in the first call.) We also have service depots in 19 cities throughout the U.S., or you can choose on-site servicing.

So, when it comes to choosing between IBM and Burroughs, take it from someone who knows both.

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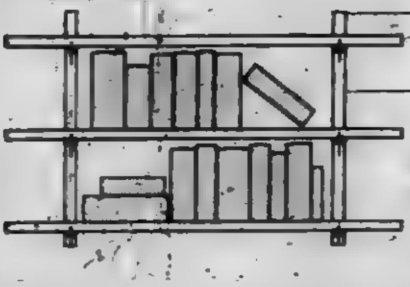


Off the Press

EXECUTIVE SUCCESS: Making It In Management
Eliza G.C. Collins, Editor
SURVIVAL STRATEGIES FOR AMERICAN INDUSTRY
Alan M. Kantrow, Editor

These are the first two volumes in the *Harvard Business Review* (HBR) series. Each is a collection of articles reprinted from the HBR and regarded by each editor as representative of the best thinking in the field.

In *Executive Success*, the articles are grouped into four main sections: personal skills, leadership, organizational skills and decision making. The editor stresses self-knowledge as the central factor in achieving success. Titles include "The Power to See Ourselves," "Must Success Cost So Much?" and "Managing Your Boss." Authors include Carl Rogers, Peter Drucker, Richard Tanner Pascale and Henry Mintzberg.

Survival Strategies for American Industry propounds a revival of our country's industrial strength and "shows how its managers have been guided by a myopic concern with the quarterly profit statement, while ignoring long-term investment in technological and manufacturing excellence." Most of the articles are concerned with factory production and manufacturing concerns, prefaced by some pieces on managerial matters.

Future HBR Series titles of interest to *Computerworld* readers will be reviewed in Off the Press. In addition, HBR is now available in an electronic data base, called HBR/Online. It extends back 12 years.

Executive Success: Hardcover, 542 pages, ISBN 0-471-87595-3, $22.95.

Survival Strategies: Hardcover, 598 pages, ISBN 0-471-87632-1, $22.95. John Wiley & Sons, Inc., 605 Third Ave., New York, N.Y. 10158.

SYSTEM DEVELOPMENT
By Michael Jackson

For those familiar with Jackson's program design methodology, which he terms JSP, this book may be of interest. It takes the next step into systems development — JSD — but in so doing redefines the tasks performed by programmer, analyst and designer. They all perform activities within development, a six-step procedure. The first four steps define the system specifications and the last two implement those specifications. Traditionally, program design and the actual programming itself were accomplished once the system was designed. This tends to place system users' goals at odds with end users' needs.

With JSD, programming activities (JSP) are interspersed throughout, and the system goal is to reflect real-world operations and constraints. After explaining how JSD is developed, Jackson concludes the book with three useful chapters, such as input subsystem and errors, system maintenance and a chapter on project management, data structures and documentation.

Hardcover, 418 pages, ISBN 0-13-880328-5, $32.00. Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632.

DESIGN OF COMPLEX INFORMATION SYSTEMS
By Grayce M. Booth

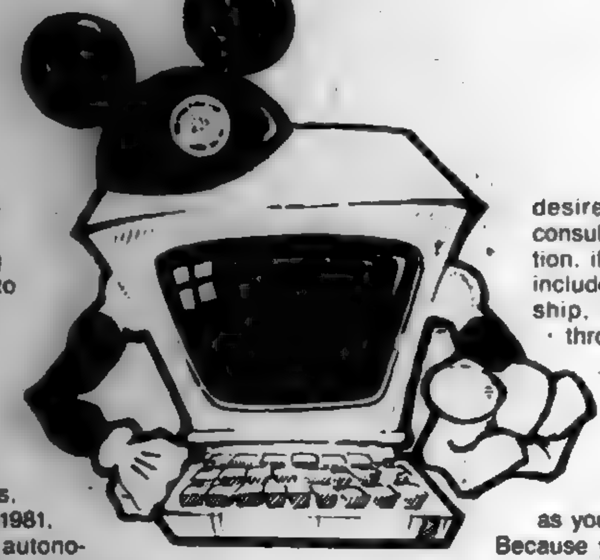
This author takes a structured approach to systems design, namely, formulating a precise definition of the system requirements in logical, step-by-step fashion, which creates an implementation more closely allied with user needs. Booth contends that new systems are far more complex and thus require a more analytic approach than in the past. It is important to keep separate systems functioning well, while also preventing their interfering with each other at the same time. These distinctions and similarities between systems actually help make them more useful and effective. The book's message is this: More forethought and careful planning make for a better system and happier users. Booth, a seasoned professional, seems to have a good grasp on the subject.

Hardcover, 320 pages, ISBN 0-07-006506-3, $29.95. McGraw-Hill Book Co., 1221 Ave. of the Americas, New York, N.Y. 10020.

COMPUTER LEASING
By Henry S. Beers Jr.

Here is the first book to cover leasing computers from a data processing professional's perspective — not an attorney's. Beers, who manages computer leasing for New York Telephone Co., has written a pragmatic book for first-time lessees, as well as a complete guide for those who want to improve their leasing knowledge and strategies. He covers legal; financial and operational risks of leasing, provides and discusses the evaluation and selection process in great detail (with sample request for proposals and leases) and shows how to avoid problems and pitfalls in leasing. This book should be required reading for anyone who is interested or involved in leasing.

Hardcover, 320 pages, ISBN 0-534-97929-7, $30. Lifetime Learning Pub-



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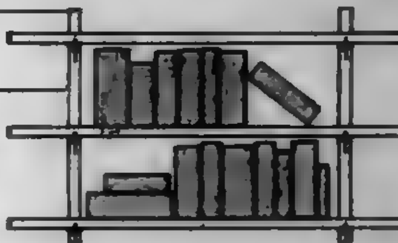

lications, 10 Davis Drive, Belmont, Calif. 94002.

AN INTRODUCTION TO OPERATING SYSTEMS

By Harvey M. Deitel

This work covers all the most current operating systems in mainframe, mini and microcomputer environments, from the IBM 360 and its four major operating systems to the Personal Computer and its latest alternative to DOS and Digital Research, Inc.'s CP/M-86. Deitel, who worked on IBM's OS and TSS, then on Multics at MIT, has written a very comprehensive book. Key chapters (there are 22 in all) cover asynchronous concurrent processes, deadlock, real storage, virtual storage, multiprocessing, disk scheduling, file and data base systems, network operating systems and security. He has written detailed case studies on Bell Laboratories' Unix (including Xenix), Digital Equipment Corp.'s VAX-11, CP/M (including MP/M and CP/NET), MVS and VM. There are over 300 illustrations and drawings featured in the book.

Hardcover, 673 pages, ISBN 0-201-14473-5, $30.95. Addison-Wesley Publishing Co., Reading, Mass. 01867.

IN SEARCH OF EXCELLENCE: Lessons From America's Best-Run Companies

By Thomas J. Peters And Robert H. Waterman Jr.

"The trouble with most business theory is that it is fanciful," according to the authors of this insightful book. "It's like trying to learn a sport without understanding how the best do it or what they look like when they play." In this fast-paced, provocative book, the authors (with a combined 26 years' experience at McKinsey & Co., a management consulting firm) detail eight basic practices that make for success, including: embody a "do it, try it, fix it" mentality; foster situations where people can be creative and take practical risks; treat employees like adults; and involve top management to create a value-driven corporate culture. Peters and Waterman conducted extensive surveys in high-tech, consumer goods, general industry, services, project management and resource development (such as oil and chemicals) firms to reach their conclusions. Who among the high-tech firms rated "excellent" — Intel Corp., IBM, Digital Equipment Corp., Amdahl Corp., Hewlett-Packard Co., Wang Laboratories, Inc., Texas Instruments, Inc., National Semiconductor Corp. and Data General Corp. — were listed?

Hardcover, 360 pages, ISBN 0-06-015042-4, $19.95. Harper & Row, 10 E. 53rd St., New York, N.Y. 10022.

STRUCTURED EDP AUDITING

By Gabriel B. Rothberg

The author said this book is a reference handbook, planning guide and learning tool for the in-house DP auditor, who is beginning to replace the external auditor. It helps both auditor and DP professionals to understand the nature and importance of a good auditing function and how to get the job done most effectively. To do this, Rothberg has written the book in modules, with charts and checklists to help organize and accomplish the audit. The book explains data processing environments from an auditor's perspective and auditing practices and procedures within the context of data processing. Both audiences should find the book useful.

Hardcover, 302 pages, ISBN 0-534-97931-9, $30. Lifetime Learning Publications, 10 Davis Drive, Belmont, Calif. 94002.

Next month, Off the Press will be devoted to books on personal computers in the corporate environment. Publishers wishing to have their books considered for review should send them promptly to the Book Review Editor, Computerworld, 375 Cochituate Road, P.O. Box 880, Framingham, Mass. 01701.

CONVERSION OF COMPUTER SOFTWARE

By John R. Wolberg

It is reported that the world's largest conversion project is the U.S. government's Social Security Administration, so if you're facing conversion at your firm, take heart — things could be worse. Wolberg, who has worked in the field for nearly 10 years, breaks conversion into six neat topics, so you can read only what is of immediate concern. The topics are: the conversion process, economics (costs), management, enhancements, conversion software and conversion algorithms. The author's own conversion language, called Convert, is discussed in the final chapter.

Hardcover, 239 pages, ISBN 0-13-172148-8, $19.95. Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632.

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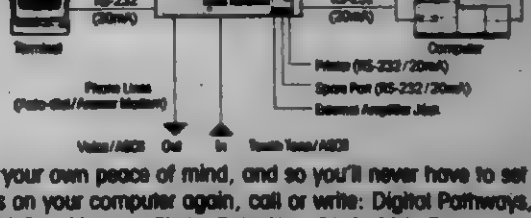

For your own peace of mind, and so you'll never have to set eyes on your computer again, call or write: Digital Pathways, 1060 East Meadow Circle, Palo Alto, CA 94303. Telephone: (415) 493-5544. TWX 910-379-5034.

DIGITAL PATHWAYS

CW Soliciting Articles On Manufacturing in Transition

CAM, MRP and FMS are some of the hottest new topics in the world of computers, and *Computerworld* wants to tell its readers more about computer-aided manufacturing, materials resource planning, flexible manufacturing systems, robotics and shop-floor control.

CW's April 25 issue will include a Special Report covering manufacturing in transition and the part that computerized systems are playing. We are looking for articles on how the new manufacturing technologies fit together and what they all mean to DP operations in a manufacturing environment.

Tutorials on all aspects of computers and manufacturing are welcome. Other areas of interest include user experiences, application stories, studies, management strategies and psychological effects.

Articles should be five to eight typed, double-spaced pages. The deadline is March 18, but earlier submissions are encouraged.

Stories and accompanying artwork should be sent to Bruce Hoard, *Computerworld* Editorial Department, P.O. Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

Ski Ticket Sales Snowball With Reservation System

SAN DIEGO — A computerized reservation system that allows skiers to order lift tickets at sporting goods stores before hitting the slopes has been operating with great success here, according to its users.

The Electronic Ticketing (ET) system has been established in Los Angeles, Orange, San Diego and San Bernadino Counties in California. Each of the 10 reservation locations has a terminal that allows for direct and immediate printouts of ticket reservation confirmations. The remote terminals service California's San Bernadino Mountains' popular Snow Summit ski area.

The system was developed by Cubic Corp.'s Data Systems Division. It consists of Applied Digital Data Systems, Inc. terminals with 64K bytes of random-access memory hooked into a Zilog, Inc. Z80-based microcomputer and Cubic's proprietary software reservation system.

The ET system allows skiers to bypass both Ticketron lines and lines at the mountain by just picking up their ticket upon arrival. It also enables Snow Summit, which only sells a limited number of lift tickets per day, to know how many people are coming on a given day, and even sell out before the actual date.

Melissa Core, Snow Summit's ticket sales supervisor, explained that the ET system is more convenient for skiers than purchasing through Ticketron, where they might have to wait in line behind people buying tickets for various sporting, concert or theatre events. It also reportedly benefits the sporting shops by increasing traffic, she said. "It's been very successful," she summarized.

In testimony to the system's success, sales are reportedly running approximately 10,000 ticket/mo with the ET system.

"Sales vary because of holidays, peak periods and weather conditions, but people are using it and it's been very helpful to us," she concluded.

Robotics Meet Set for April 17

DEARBORN, Mich. — The 13th International Symposium on Industrial Robots will be held in Chicago April 17-21.

The symposium is sponsored by Robotics International of the Society of Manufacturing Engineers (SME) and the Robot Institute of America.

Called the largest industrial robotics conference ever held, the conference will feature lectures by more than 80 robotics experts and industry leaders and exhibits by more than 150 robot builders and suppliers.

The full conference registration fee is $495 for nonmembers and $435 for members, with a single-day registration price of $220 for nonmembers.

SME is located at One SME Drive, P.O. Box 930, Dearborn, Mich. 48128.

CAD/CAM Software Theme of Publication

ARLINGTON, Texas — A guide to 283 software products for manufacturing management systems is available from the University of Texas at Arlington.

The 400-page loose-leaf guide, titled "CAD/CAM Presentation Resource Guide," lists products in areas including computer-aided design and manufacturing, group technology, computer-aided process planning, numerical control, robotics and automated storage-retrieval systems.

The publication costs $125 from the Office of Continuing Education, University of Texas at Arlington, Arlington, Texas 76019.

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Law Firm Foresees $50,000 Savings From Micro

LOS ANGELES — A law firm here expects to save about $50,000 over the next three years because it installed a microcomputer system that it said helps it better manage its time and billing functions.

Berger, Kahn, Shafton & Moss installed a turnkey system based around an Altos Computer Systems, Inc. ACS8000 processor and 10M bytes of Winchester disk storage. Specialized software for the system was developed by Star Systems, Inc. of Torrance, Calif., according to attorney Tony Shafton, who managed systems acquisition for the firm.

The 50-year-old law firm had been using a time-sharing service. "Although we were looking for improvements in our operation, we had no wish to abandon the basic structure set up with the [service] bureau," Shafton said.

But the service bureau was becoming too expensive to serve the 17 attorneys who make up the firm. With about 3,000 cases pending, the law firm was paying about $2,000 a month for a computerized billing service, which often took three weeks to process, Shafton recalled.

Aside from cost, the service bureau presented some other problems. For example, billing statements were submitted to the system in batch mode. If time reports submitted by the attorneys came in late, the firm either had to hold up its entire billing run or process an incomplete run, skipping over some bills until the next month.

"Another drawback was that up-to-date information couldn't be obtained" from the service bureau, Shafton recalled. "If a client requested the current status of his or her bill, we either had to gather the figures manually or shrug our shoulders and say we couldn't produce them."

With the Altos system, billing runs are not restricted to a given day, and late time reports can be processed individually. In addition, the processor's data base is updated daily and specific client information can be obtained in seconds, Shafton said.

Moreover, accuracy has improved, Shafton reported. Data entry clerks at the service bureau often charged attorney expenses and time to the wrong accounts.

Furthermore, the system has eliminated the need to retype billing pages in a format that can be read by the service bureau.

Nasa Catalog Introduced By Cosmic

ATHENS, Ga. — A catalog of over 1,300 applications programs developed by the National Aeronautics and Space Administration (Nasa) is available from Cosmic, Nasa's software dissemination center.

The "1983 Cosmic Catalog" includes new programs covering computer graphics, turbomachinery and system security. Programs are all applicable beyond the aerospace industry and are useful in engineering, chemistry, physics and energy conservation.

The catalog costs $10 on microfiche or $50 on computer magnetic print tape from Cosmic at 112 Barrow Hall, University of Georgia, Athens, Ga. 30602.

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GENERAL ELECTRIC

Firm's Offices Purr With WP Configuration

ST. LOUIS — It is not surprising that as the Ralston Purina Co. grew in great leaps beginning in the '50s, its typing pool had to deal with an increasingly voluminous supply of paperwork. And each typist was expected to produce error-free work on the first try.

In reality, most office documents were typed at least twice because of operator mistakes or reviews by the author, according to Willa Voyles, Ralston's manager of word processing and records management and a 30-year Ralston veteran. If the work load increased, Voyles said, another secretary with another typewriter joined the pool.

However, the manual typists could not keep up with corporate demands because operator skills were not improving, Voyles noted.

With the first wave of computerized office technology, Ralston made investments in magnetic tape devices, buying IBM tape equipment in the '60s. In 1974, Ralston tested tape systems made by Wang Laboratories, Inc. and other vendor's equipment. Ralston selected Wang and stayed with it as Wang enhanced its product and progressed toward its CRT terminal-based shared logic systems.

The word processing configuration in the Corporate Services Department presently consists of Wang OIS 140s with 15 CRT workstations and six daisywheel printers. Four word processing satellites are located throughout corporate headquarters in departments such as Legal, Engineering, Grocery Products and Protein Products, each of which is connected to the 140.

The central dictation system operated by the Corporate Services Department extends throughout the company and produces much of the copy used in correspondence. The word processors, Voyles said, function as a kind of word factory that is recognized throughout the company as a necessity and not a luxury.

Cut Report Time

The 140-based system has greatly reduced the time consumed in assembling periodic reports, Voyles said. Formerly, a 25-page report for immediate handling was distributed to five different secretaries, five pages at a time. Today, a single operator inputs successive drafts without introducing new errors, and the printers produce a quality copy in minutes, she said.

At the Legal Department satellite, operators compose contracts, opinion statements, legal briefs, patents and copyrights. Because of the sensitivity of legal language, repetitive drafts of a brief may require major revisions or just the replacement of a phrase.

With word processing, there is no cutting and pasting, and a fresh version can be produced in minutes, Voyles remarked.

The system also facilitates the work of field salesmen. They dictate sales reports to the satellite dictation system, where secretaries produce final reports as well as various form letters for customers.

Recently, the Corporate Services Department linked the satellites to the word processing center with Wise, a Wang intrasite OIS network for systems dispersed throughout a large facility.

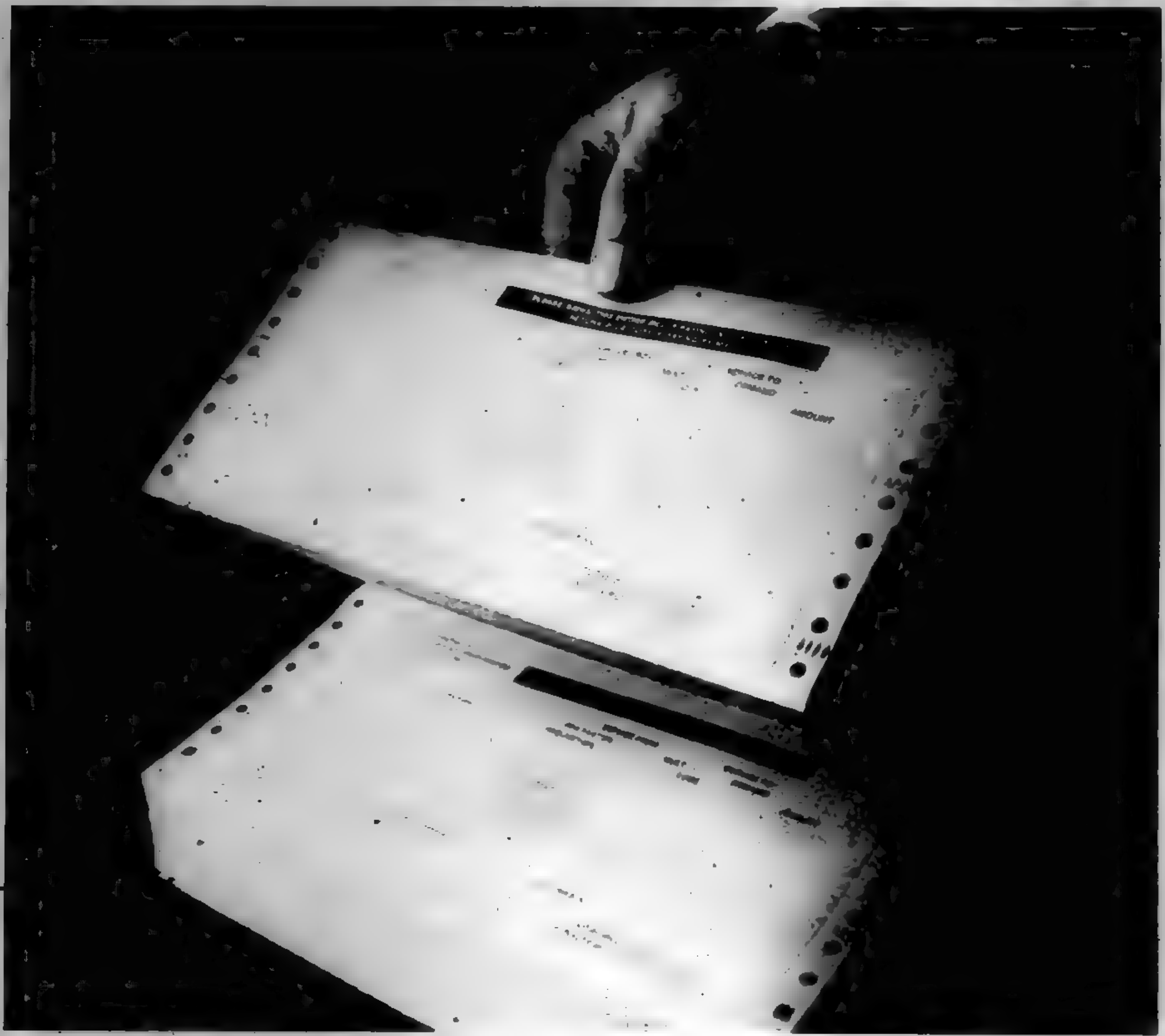
MIT AI Papers Offered by RIA

DEARBORN, Mich. — The Robot Institute of America (RIA) and Comtex Scientific Corp. have released a complete collection of key documents from the MIT Artificial Intelligence Laboratory.

The collection, which is assembled on microfiche and covers the period from the lab's inception in 1958 to 1979, includes key papers, reports on robotics and information on robotic vision and related fields, a spokesman said. The lab is considered to be a pioneer in research on artificial intelligence and robotics.

The price for the collection is $2,450 from RIA Headquarters at One SME Drive, P.O. Box 1366, Dearborn, Mich. 48121.

HOW TO MAKE MONEY IN ONE EASY STEP.



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Airfreighter Opts to Buy, Switches Vendors

SEATTLE — Increased productivity and monthly savings of at least $4,000 resulted when an airfreight business switched from computer leasing to buying.

Wits, Inc., with annual sales of approximately $25 million, shipped nearly 22 million pounds of freight during 1981 using guaranteed cargo space on commercial airlines' domestic and international flights. The company, which offers door-to-door service, picks up freight at the airport, then delivers it by truck to its final destination.

"The airlines give us a much better rate when we consolidate a lot of freight for a flight between, for example, Seattle and Los Angeles," explained Dick Voorhees, vice-president for DP. "Our profit margin really comes from how much business we can attract at a single point of origin."

Back in 1979, Wits was "spending hundreds of thousands of dollars" leasing a Burroughs Corp. B1726 computer. However, the B1729 "couldn't provide the reliable, on-line communications we were looking for," Voorhees recalled.

To handle the processing load of 12,000 shipments per month, the firm needed a computer that would operate around-the-clock and permit fast communications between the main office and airport stations. Casting about for the perfect machine, Voorhees considered systems from IBM, Digital Equipment Corp., Tandem Computers, Inc., Honeywell Inc. and Burroughs Corp.

Because of its cost and uptime reliability, Wits finally decided on a three-processor Tandem Nonstop computer with three power supplies, two disk controllers and four drives. "For the past three years, it has saved us money over and over," Voorhees said. "In addition, although our DP department has only a few employees, we are able to get an incredible amount of work done because of the equipment's flexibility.

"For example, we configured and helped build 40 of our own intelligent terminals and printers and easily adapted them to the Tandem system," he said. "Overall, the machine allows us to custom-tailor hardware that we have a specific need for, quickly and economically."

Wits world headquarters here uses the computer to keep track of where shipments originate, their destinations, when they will be picked up, if they are currently on the ground or in the air and which flight lanes are the most profitable.

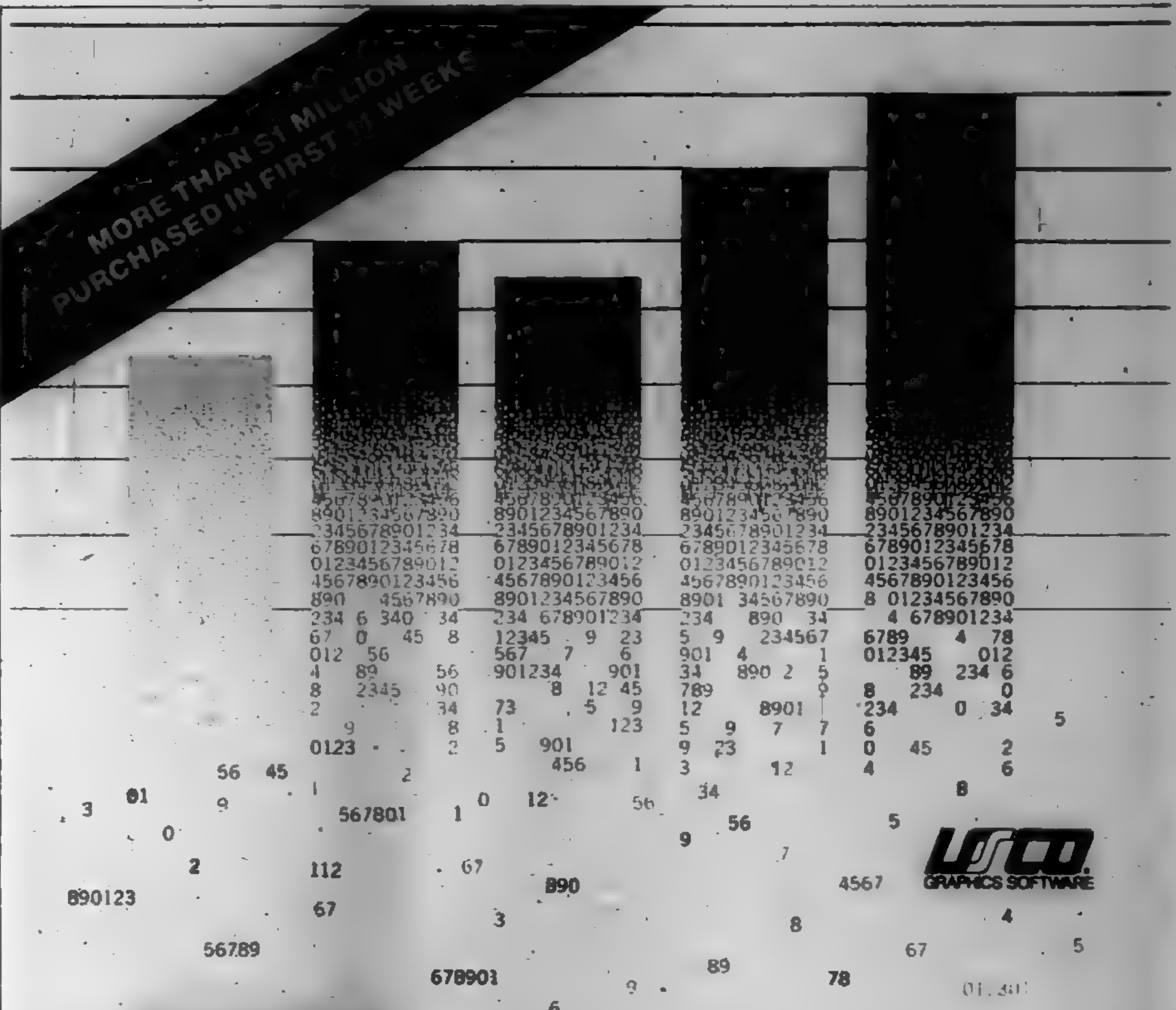
Before a flight lands, the main office transfers this information to airport stations via the system's automated message-switching network. Because station workers know ahead of time how much freight will be delivered, they can plan logistics.

"Edited messages can be sent between the main office and airport stations or from station to station using intelligent terminals," Voorhees explained. After keying in the message, the operator hits a button that transmits it to the Tandem system here, where it is analyzed and switched to the proper destination.

"An average message of 500 characters sent from New York to Los Angeles through Seattle takes only two seconds, so it's extremely fast," he noted. Typical messages include "alert manifests," telling stations when and from what airline to pick up freight, plus what boxes and weights to expect, and "reverse alert manifests," explaining what pieces were picked up from an airline and when.

Wits personnel also store and forward messages on the system to verify delivery or to solve billing problems. In addition, the accounts receivable application keeps track of million of dollars in accounts receivable and provides an "excellent" audit trail, Voorhees said.

"As a matter of fact, we've never lost a transaction and never been out of balance since the Tandem came online," he noted. The Nonstop system consists of multiple processors, each with its own work load, but each capable of taking over the load of any other processor that fails.



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Utility's Productivity Fueled by OA System

NEW YORK — At Brooklyn Union Gas Co., office automation — achieved with a combination of word processing and administrative work force concepts — is increasing the productivity and efficiency of the company's office staff, a company spokesman said.

To fill a need to process more sophisticated applications that require greater systems capability, the company upgraded its IBM 3730 host-based word processing system to the IBM 8100 information system. "With the 8100, we are able to obtain the additional features necessary for cost-effective growth," said Allison Haug, systems analyst.

Brooklyn Union Gas, incorporated in 1895, is an investor-owned utility serving an area of about 187 square miles here consisting of Brooklyn, Queens and Staten Island and a population of approximately four million people. The company's 1981 revenues of $716 million were derived primarily from the operation of 1,07 million active meters.

Of the company's 3,500 employees, nearly 140 are employed in the Corporate Data Processing and Systems Services departments. With a $6.8 million budget, these departments oversee the management, budgeting and planning of all data processing activities.

Brooklyn Union's office system is composed of IBM model 3732 terminals and model 3736 printers linked to two 8140 processors. The operating system is IBM's Data Process Control Executive. It runs with the Distributed Office Support Facility, which provides text functions, automated correspondence and column manipulation, as well as spelling verification, math calculations and records processing.

"The 8100 system simplifies document handling," according to Lucy Chencinski, methods analyst. "We can now string a whole series of commands together, so operators can enter one instruction to perform several tasks. This simplifies operator training and document processing."

"When we began thinking about implementing office automation, we also reevaluated our administrative organization structure," said William Feraudo, manager of the Systems Services Department.

"Our traditional pattern had been to assign one secretary to each executive and to link the secretary's career path to that of the executive served."

Support Team Developed

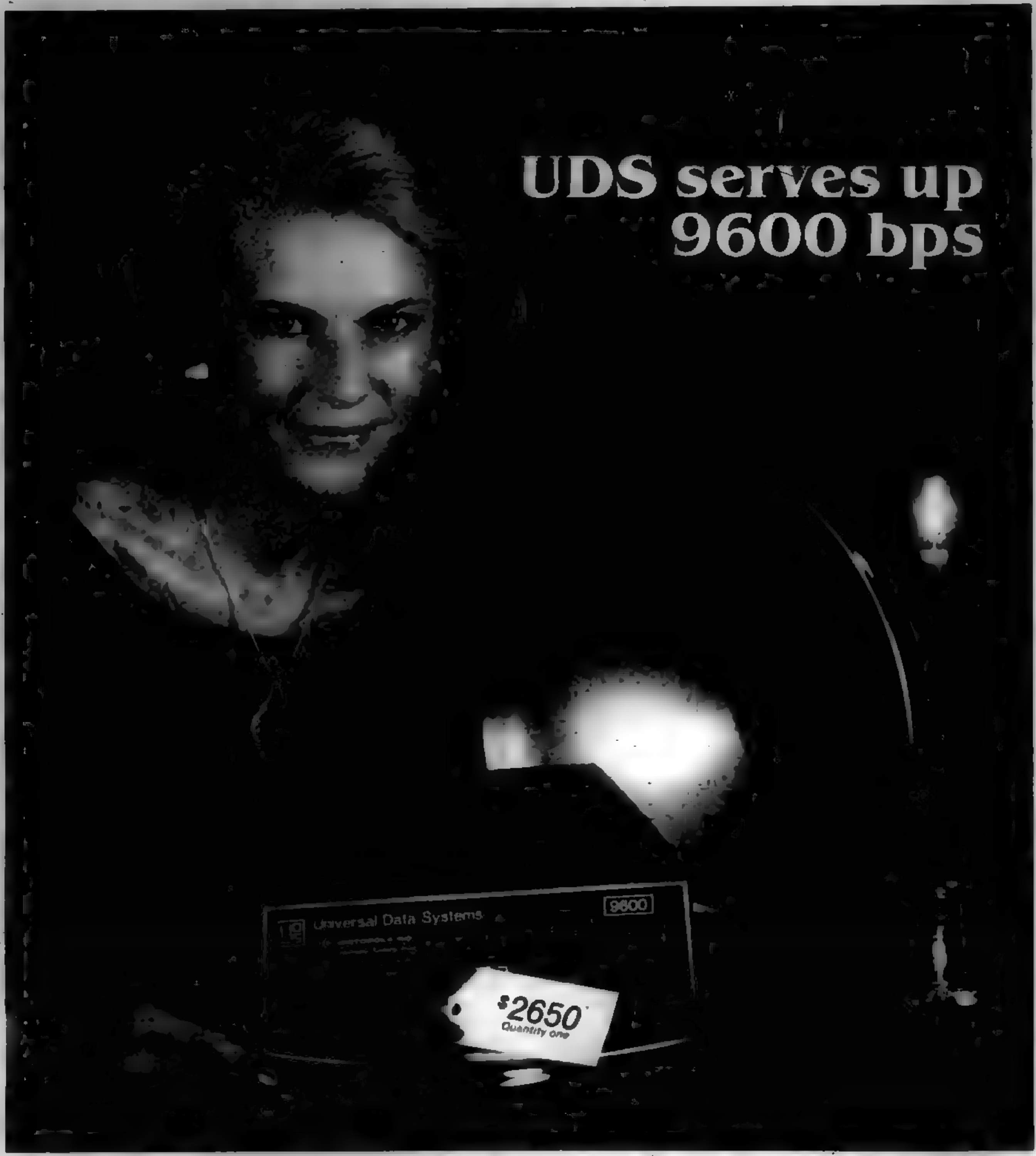
As the automated system was adopted; Brooklyn Union reorganized its administrative staff structure on a pilot basis. The result was the development of an administrative support team or cluster.

It consists of three word processing specialists and a supervisor. Projects for the administrative team come from several areas: marketing and advertising, corporate planning and two subsidiaries: Gas Energy Inc., which sells gas appliances, and Fuel Resources Inc., which engages in fuel exploration.

Word processing in conjuction with the administrative team concept has already begun to produce benefits.

"Although the cluster concept is still an experiment," said Maurice Shaw, senior vice-president of marketing and advertising, "we've seen enough to know that we're achieving genuine gains from word processing in that context. Efficiency has increased. We can now serve about 50 people with four administrators, rather than the 12 to 15 we formerly required. Job turnaround is faster. The need for filing space has also decreased."

'Power Failure! Everybody Think!'



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Zenith Cuts Delivery Time, Costs With E-Mail System

GLENVIEW, Ill. — Zenith Radio Corp. has established an in-house electronic mail system that reportedly provides faster communications than the Postal Service, lowers the cost of next-day delivery, provides verification of delivery and improves productivity by providing each of its distributors with a text management system and other business software.

According to Tom Buchsbaum, director of information systems with Zenith, the system also improves sales and inventory reporting in addition to sending messages automatically for less than 20 cents per message and less than 60 cents for immediate day-time delivery.

Called Zgram, the system is the answer to Zenith's search for an effective and inexpensive way to communicate sales, inventory, shipments, order entry and messages with its North American distributors, Buchsbaum said. Zgram is being used at 72 of Zenith's distributor sites in the U.S. and Canada, the company's 67 Heathkit Electronic Centers and 50 other locations.

Information exchanged between Zenith Radio and its distributors includes reports on sales to dealers, product inventory, replacement parts orders, shipment notifications and credit claims. That information used to come in through the U.S. mail, telephone, telegram, mailgram, Telex and messenger services.

The system uses software written by Zenith's Information Systems staff, small computers sold by its Zenith Data Systems Corp. subsidiary and GTE Telenet, Inc.'s Telemail electronic mail service, which operates over GTE Telenet communications network.

"Zgram allows the desktop computer to be used as a word processor or data processor during the day and an unattended communications terminal at night, when costs are at their lowest," Buchsbaum said.

At Zenith's end, Zgram is linked to the company's mainframe computers. "Data that used to be received in the mail, keypunched and proofread now comes into the computer directly, saving the company more than $40,000 per year," he noted. "We have greatly reduced data handling, forms, long-distance telephone charges, telegrams and postage costs, but the greatest benefit is the timeliness and accuracy of the information."

The software, in conjunction with the Telemail network, is the heart of the system. The software is written in Cobol.

The menu-driven system is easy to use because it includes a help key, extensive training and reference materials and an intensive two-day training and consulting session.

It reduces operation costs from telephone charges and time-sharing computer time because all message compostion is done off-line. It uses the unattended night-time hours, and Telemail service and GTE Telenet computers are available through local numbers in many cities.

"Reliable data transmission was a necessity because the system is used to collect customer orders and sales and inventory data from our distributors for processing directly on the company's mainframe computers," Buchsbaum said.

In order to ensure reliable data transmission, every character is examined and retried for data integrity, three telephone numbers are available, an unattended restart feature acts as a backup in case of power failure and the system monitors the quality of telephone lines, transmitting on another line if warranted.

All messages are also encrypted for security and the Zgram software has the ability to send data, programs or graphics as easily as text.

Computer operator Susan North discusses with Bernie Erlich, president of Zenith Distributing of Kansas, a memo that she is preparing.

Slated for March 22

IDMA to Sponsor Pick Users Meet

SAN DIEGO — The International Database Management Association (IDMA) will sponsor "Pick Spectrum '83," a users' conference for users of the Pick operating system, which runs under equipment from Honeywell, Inc., IBM and other vendors. The conference will be held on March 22 in the Lake Tahoe, Nev., area.

About 35 software vendors are booked to demonstrate new Pick-compatible applications packages. In addition to tutorial clinics on the use of the Pick operating system, registrants are offered sessions ranging from "How to Set Up Local User Groups" to "Humanistic Design."

The registration fee is $150 for IDMA members, $200 for others. More information is available from IDMA, located at 22982 La Cadena, Laguna Hills, Calif. 92653.

Users Group Forms to Support Vector Graphics

OKLAHOMA CITY — A users group has been formed for users of computer systems from Vector Graphics, Inc. The Vector Graphics Users Group lists among its services:

- The promotion of a wider usage and acceptance of Vector Graphics computers in the home and in small businesses.
- A monthly newsletter containing update information about hardware and software products that are available.
- An information interchange for bugs and fixes.
- A software library for users.

Subscription to Vector Graphics Users Group costs $25/year and includes the monthly newsletter, software library index and free copies of user-supplied software. A copying charge of $8 will be made to cover the cost of the diskette and mailing charges.

More information is available from Vector Graphics Users Group, 10201 E. North Finley, Oklahoma City, Okla. 73120.

QED Establishes Education Center

SEATTLE — QED Information Sciences, Inc. and City University-Seattle are formally establishing a regional computer education center here. The sixth in QED's national data processing educational network, the center is located on the Bellevue campus of the college.

The center will offer a full curriculum of courses on systems development, data base, data communications, software support and project and systems management.

Further details are available from QED at QED Plaza, Wellesley, Mass. 02181.

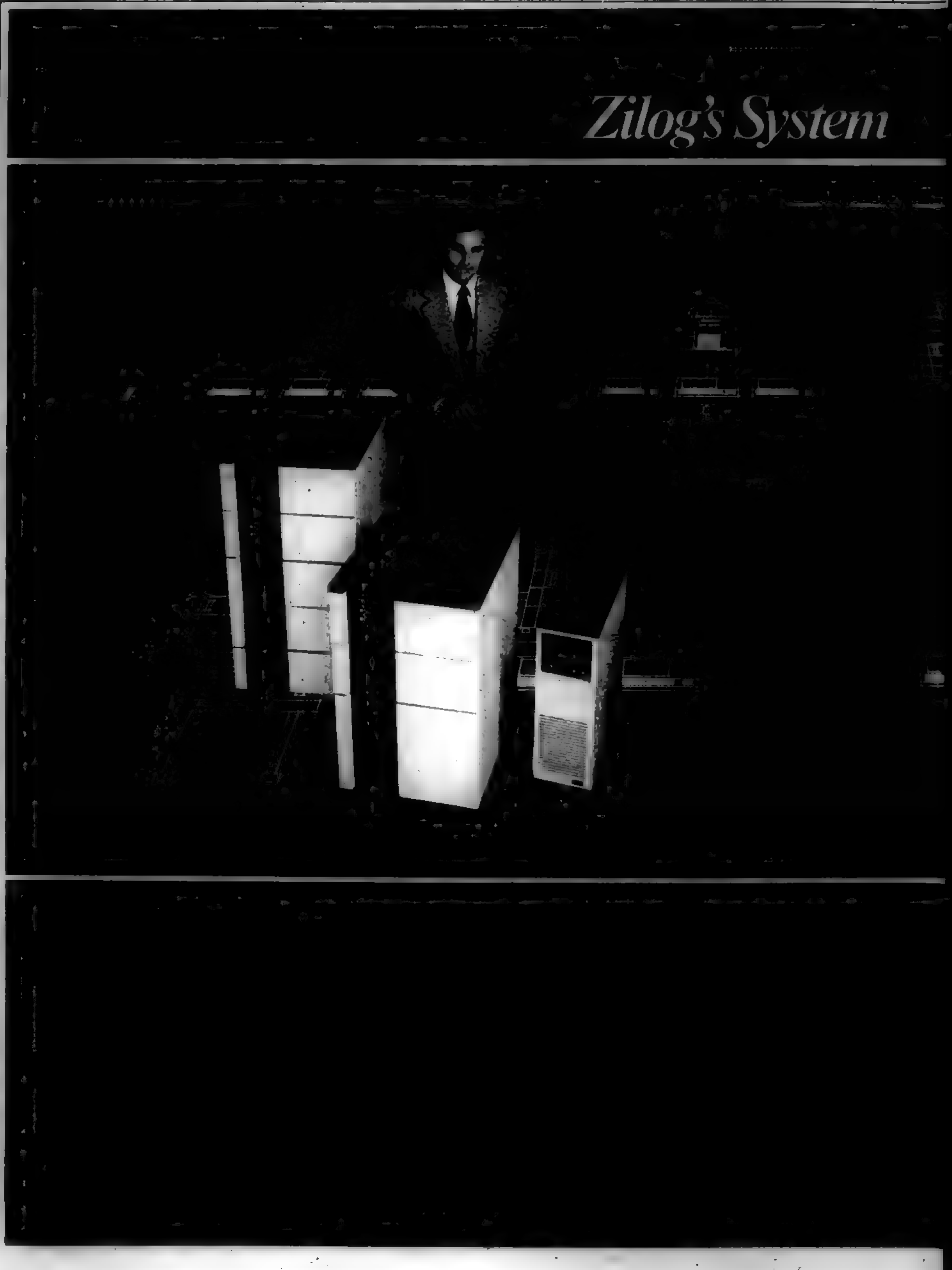
'Let's See How Well My Computer Plays Now That I've Evened Up the Odds a Bit.'

AIM Seeks Nominations For Three Awards

WASHINGTON, D.C. — Associated Information Managers (AIM) is seeking nominations for three awards to be presented at its Second Annual Meeting at the Mayflower Hotel, which is being held here May 2-4.

AIM will present its fourth annual William T. Knox Outstanding Information Manager Award and two other awards: the 1983 AIM Product Award and the 1983 AIM Technology Award. Prof. Jon A. Turner of New York University's Graduate School of Business Administration is in charge of the awards committee.

Nomination forms are available from AIM, Suite 400, 316 Pennsylvania Ave. S.E., Washington, D.C. 20003.



Software Handles Firm's Employee Relations

WILMINGTON, Del. — Combining 11 separate employee relations software systems into one system saved both time and money for ICI Americas, Inc., a $1 billion diversified chemical corporation based here.

The independent systems, which handled such functions as skills inventory, employee benefits and job history, required redundant input and programming in order to gather information from more than one data base, a spokesman said. Employee relations managers often waited over two weeks for a report.

The backlog was an outgrowth of rapid growth at ICI, which grew from a small company in 1972 to a present 15,000-employee conglomerate. In 1976, management saw the necessity to maintain personnel data in a more efficient manner.

"The free-standing systems would not withstand the weight of future demands," said Robert Marceluk, manager of personnel systems and records. "In addition, the information was being collected and retained, but management could not receive complex reports soon enough to meet its needs."

One difficulty was that the systems in place required complex technical knowledge from both DP personnel and users. "If we could find a way to get the end user closer to the data, we knew that we could achieve significant time and cost savings," Marceluk said.

While evaluating various time-sharing and software options, the employee relations department heard about Infodata Systems, Inc.'s Inquire resource management system, which was in use in ICI's clinical research department. The referral led them to test and subsequently buy Inquire.

Less MIS Effort

"Inquire proved to be more efficient than ever expected," Marceluk said. "The management information systems [MIS] effort to create an on-line retrieval capability was 25% less than originally anticipated. Even some enhancements not originally planned, such as password security and multifile capabilities, were installed with little difficulty."

Marceluk said Inquire also proved to be more user-friendly than the department had expected. "We posed questions we never dreamed of asking before," he said. "Because Inquire was powerful in its multidata-base retrieval capabilities, employee relations personnel were able to get information from multiple systems that never were designed to be accessed simultaneously.

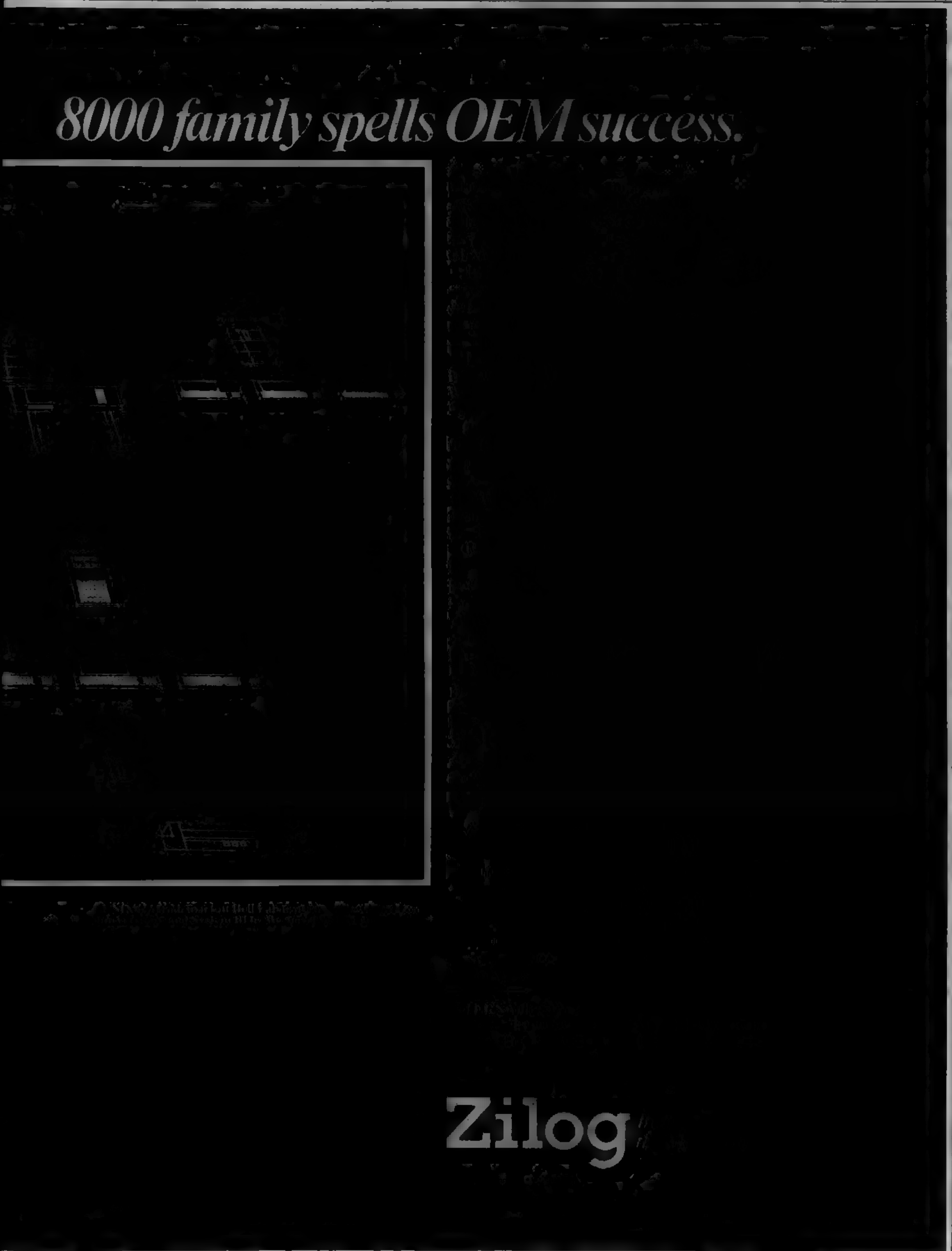
"For the first time we had a powerful tool to cross-reference and check the accuracy of data in multiple systems."

Cost/Benefit Analysis

Marceluk said that a cost/benefit analysis found that it would take seven user-generated reports each year to justify the incremental cost of on-line Inquire retrieval. However, during the first year the department completed 20 major personnel reports without DP assistance.

Employee relations and MIS made a joint recommendation to develop a human-resource information system to centralize control within the employee relations department and to custom design the system using Inquire as the data base management system. However, passage of the Employee Retirement Income Security Act in 1976 required management to integrate payroll and benefits/pension information.

Employee relations redefined its project goals to include integration of a benefits and personnel package from Management Sciences America, Inc. "Even though we met our data maintenance requirements with the packaged personnel/payroll/benefits system, we didn't want to sacrifice the Inquire retrieval and multidata-base capabilities, so we married the two systems," Marceluk said. "Now we run a more powerful and comprehensive system."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Airline Guide to Go On-Line May 1

OAK BROOK, Ill. — Dun & Bradstreet Corp.'s Official Airlines Guide will go on-line May 1. Anyone with a terminal capable of accessing a dial-up network will be able to use the system for a $50 start-up fee plus an average $2.50 per-time usage charge, the company reported.

The electronic guide will present the same basic information available in the printed versions of both the North America and worldwide travel guides. Initially, only U.S. flight schedules and fares will be listed, according to David H. Shaffer, vice-president at the firm's Official Airlines Guide Group.

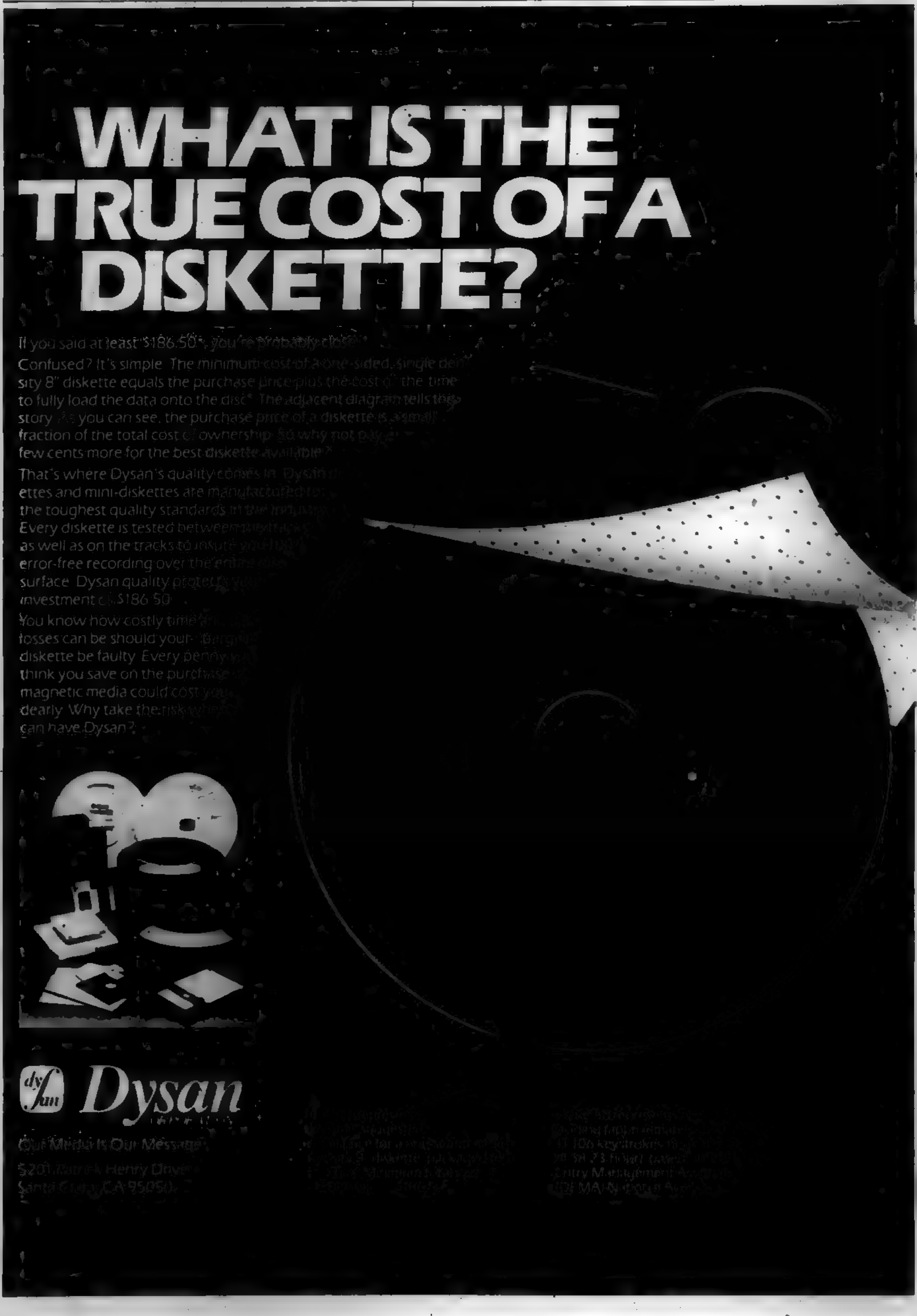
Aimed primarily at people who fly frequently, the electronic service can also be used by private and corporate travel agents and small airlines. Fare coverage is updated daily and scheduling information is updated on a weekly basis, Shaffer said.

Users can poll the system either by the time they want to leave for a particular destination or by how much they want to pay to get there. In the case of fare-driven inquiries, the system lists the least expensive flight first.

The service only provides a listing of scheduled flights, fares and other airline information. Users must make reservations either directly with the airlines or through a travel agency, Shaffer said.

More information about the on-line service is available from Dun & Bradstreet's Official Airlines Guide Group, 6000 Clearwater Drive, Oak Brook, Ill. 60521.

'This May Take a While — I Don't Know How to Type.'



WHAT IS THE TRUE COST OF A DISKETTE?

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Dysan CORPORATION

Warns of Potential for 'Visisnowing'

IRD Exec: Micro Boom to Spark False Assurance

By Marguerite Zientara
CW Staff

NORWALK, Conn. — Companies must become aware of the increasing potential for "Visisnowing" inherent in the skyrocketing use of business microcomputers, warned Stephen Caswell, president of Network Innovations, Inc. of Ottawa and a project director for International Resource Development, Inc. (IRD) here.

"Visisnowing" is simply a "snow job" as applied to microcomputing, Caswell explained in a recent interview. A recent IRD report asserts that "because [financial spreadsheet and scheduling] programs produce highly polished output, at least in terms of appearance, they can easily give the impression that the level of assurance surrounding the projection is far greater than in reality."

The 265-page "Non-Vertical Business Markets for Microcomputers and Software," which notes that microcomputers are being shipped at an annualized rate of four million machines worldwide, also projects that the 1982 estimate of $3.7 billion spent on microcomputers and peripherals will swell to $18 billion by 1986 and $45 billion by 1991.

With such a volatile and burgeoning market, "we've seen a great amount of information about how these machines will be everywhere," Caswell observed. "But there's been very little discussion about what they'll actually do in organizations in terms of impact."

One of the major impacts will call for adjustments in the way we regard computer output, according to Caswell. "Today, typically the cost of producing a lot of charts and graphs and the time required to do market projections is such that very few people really go out and actually do it on a regular basis," he noted.

Currently, before numbers are transformed into graphics form, "they've been consulted on by a team of people and the group involved in producing the report has all pretty much signed off on it," he continued.

Therefore, the graphs and slides produced constitute an "official view of the company, although they may not be accurate in relationship to the real world," he noted.

With a microcomputer, on the other hand, Caswell pointed out, "any one individual who happens to be working with a personal computer will be able to go out and produce the same official-looking [product] and these official-looking graphs and charts will be entered into the [planning] process before everyone agrees upon them."

While the past 20 or 30 years have conditioned business people to regard computer-generated charts and graphs as output of the planning process, "with the personal computer's charts, what you're really looking at is the input," he added.

One of the major advantages of computerized scheduling and accounting is, of course, that relationships and projections that could not normally be handled in one's head or with pencil and paper can now be undertaken, IRD noted. However, these programs are only as good as the relationships that they correlate and the information supplied by the managers.

"I don't want to say that people's view of numbers will become more jaundiced, but they'll have to become more aware of the source of numbers," Caswell warned. "The computer allows enormous flights of 'what-if' fantasy, and it becomes increasingly easy to crank out official-looking but entirely hypothetical documents."

The report also identifies the procurement patterns and applications of personal business computers, estimates the markets for these devices and their peripherals and discusses the key vendors in the personal business computer market. The report costs $985 from IRD at 30 High St., Norwalk, Conn. 06851.

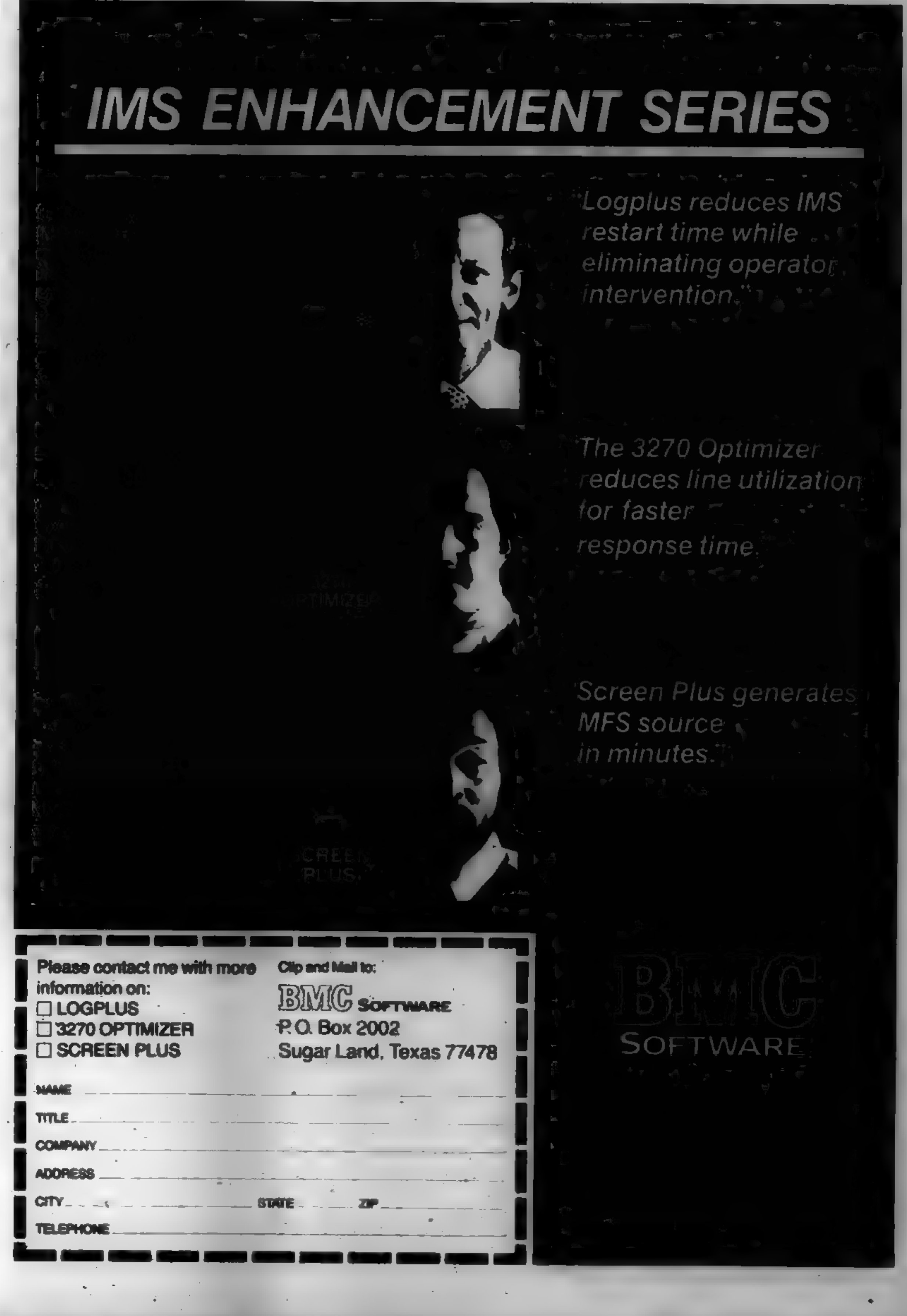
Series Offered On DMF, SPF

NAPERVILLE, Ill. — A seven-part video journal series for application programmers entitled "SPF (Structured Programming Facility)/MVS Dialog Management Facility (DMF)" has been announced by Deltak, Inc.

Series No. 18-4XX includes one part to acquaint managers with DMF capabilities and six parts for technicians who will develop working applications to run under SPF, a spokeswoman said. The series may be self-administered or presented on a group basis.

Courses include introduction to dialogue management, basic panel coding, additional panel specification and dialogue testing, coding dialogue functions, advanced dialogue preparation, file tailoring facility and table handling, the spokeswoman said.

Purchase price is $1,750 per course from Deltak at 1751 W. Diehl Road, Naperville, Ill. 60566.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Cincinnati's Most Sophisticated
Automated Stock Exchange Replacing Humans

By Tom Henkel
CW Staff

CINCINNATI — Can computers perform traditional human jobs that involve quick, abstract analysis and some good old-fashioned hunch playing?

Officials at the Cincinnati Stock Exchange are betting that its automated stock exchange, dubbed by some as the most sophisticated in the world, can do just that. Other exchanges, however, believe that a highly automated securities trading system just can't replace humans when it comes to making the subtle judgments carried out daily by auction floor specialists.

Most stock exchanges agree that some form of computerization is a good thing. The question is how much. Major exchanges such as the New York Stock Exchange, Philadelphia Stock Exchange, Midwest Stock Exchange in Chicago and the Pacific Stock Exchange have automated routing and execution systems that allow brokerage houses to transmit relatively small orders from their offices to the exchange floor. In addition, most major exchanges belong to the computerized Intermarket Trading System (ITS), which links seven exchanges and over-the-counter dealers.

But the Cincinnati system is different. Called the National Securities Trading System (NSTS), it offers an automated trading market in addition to automated routing and exchange features. The advantage of the system, Cincinnati officials claim, is that the investor is placed directly into the auction arena through a terminal, which can be located in the broker/dealer's office. When an asking price and bid are equal, the system automatically executes an exchange on a time priority basis — in other words, the first broker to bid a price gets the deal. This makes the system more equitable to smaller brokerage firms, according to Ken Eber, vice-president of marketing at Electronic Trading Services (ETS), the division of Control Data Corp. which runs the system.

Furthermore, Eber noted, NSTS is easier to use than other stock exchange systems because member brokerage houses do not have to place representatives on the auction floor. In fact, little of the Cincinnati Stock Exchange is actually based in Cincinnati. The ETS processors are located in Jersey City, N.J., and the bidders are located in various parts of the country.

Administrative offices and what remains of the physical auction floor are all that are located in Cincinnati, Eber said.

Traditionalist's View

However, James Gallagher, president of the Pacific Stock Exchange, believes the traditional auction floor is more effective than its automated counterpart. Gallagher claimed that most stock exchanges have determined that face-to-face dealings on the auction floor are more conducive to bargaining than watching bids flash across a CRT screen.

Specialists on the traditional auction floor can often save — or, critics would note, lose — money for their clients by using their experience to analyze the buying and selling atmosphere on the auction floor. In an automated system, sellers deal directly with buyers and may be unaware of factors influencing the market at a given time, Gallagher said. For that reason, the Pacific Exchange deliberately built a 30-second delay into its automated routing system, Scorex, to give floor specialists some discretionary power.

Kenneth Rosenblum, executive vice-president and general counsel for Chicago's Midwest Stock Exchange, agreed that his stock exchange's decision not to seek further automation is more an emotional than technical issue. "Efficiency becomes counterproductive" when automation becomes too complete, Rosenblum said, adding that the Midwest Automated Exchange automated routing system provides just enough automation.

More Strings

But the emotional issue of man vs. machine may not be the only string attached to Cincinnati's NSTS. With NSTS, a deal is automatically struck when bidder and seller reach a common price. According to Eber, big brokerage houses fear losing some of their clout to smaller firms that could be faster with a bid in an automated auction situation. In the traditional stock exchange setup, floor dealers have more discretion on when bids are entered and when the seller's price is lowered, Eber said.

Chicago's Rosenblum disagreed, pointing to the fact that the biggest NSTS user is the giant Merrill, Lynch, Pierce, Fenner and Smith.

Regardless of whether an automated system is better than the traditional system, the Securities and Exchange Commission (SEC) gave the nod to NSTS in December when it granted the system a "permanacy" status. Since it began operation in 1978, the SEC considered the Cincinnati Stock Exchange an experimental project, which means Cincinnati had to reapply for permission to use the system each year.

Richard Neihoff, president of the Cincinnati exchange, said the experimental classification made it difficult for the exchange to attract new brokers, since brokerage houses must buy IBM 3270-type CRT terminals to use the system. Furthermore, Niehoff maintained, it was difficult to justify improvements to the system when there was no guarantee the system would be used the next year.

The SEC, which in the past has been accused of downplaying and sometimes flatly ignoring attempts at automating securities trading, appears to have changed its course. Following on the heels of the permanency ruling for NSTS, it recently gave the ITS an indefinitely extended charter so the operating authority of the SEC-ordered system does not have to be renewed every year. ITS was not given a permanency classification, Rosenblum theorized, because the SEC wants ITS improved to handle a heavier volume.

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Prompted by Need for Color Graphics

Bell Exec Predicts Data Rates of 50M Bit/Sec

By Bruce Hoard
CW Staff

NEW ORLEANS — The "great need" for color graphics will lead to high-speed data transmission rates of up to 50M bit/sec in the near future, Victor A. Vyssotsky said recently.

Speaking at the Communication Networks Conference & Exposition, sponsored by CW Communications, Inc., the executive director of research for Bell Laboratories' Information Services Division also discussed how disparate technologies are combining to enhance future communications.

The need for graphics goes beyond such common applications as mapping, according to Vyssotsky. For instance, sketches of circuits are very expensive, a problem that can be alleviated through the use of graphics. The increased graphics demand will lead to the use of more bit map displays in stand-alone terminals and network workstations, he commented.

High data rates will be necessary for graphics use because of the "bursty" nature of graphics use, the research director said. While 1,200 bit/sec was fast enough before, higher speeds of 9,600, 19.2K and even 56K bit/sec are now more appropriate because users become impatient if they have to wait for results. "If you're loading 100K bytes of data to a terminal, it takes a long time at 1,200 bit/sec, but at 19.2, no problem."

Vyssotsky called the cost of design the primary obstacle to the widespread development of very large-scale integration (VLSI) chips required for small-scale products. Currently, VLSI chips are cost-effective only in mass-produced commodity products, he maintained.

The remedy to that problem is better computer-aided design tools for VLSI technology design. If those tools are not forthcoming, VLSI technology may stagnate, he said. But, he added, "I have confidence the tools will be there when we need them."

Software Development

Software development is not proceeding fast enough to suit Vyssotsky. "Here, unfortunately, I'm pessimistic," he said. Software inadequacies are compounded by the demand for external software needed to support and maintain primary packages, he explained.

Vyssotsky did not predict any software breakthroughs, although he did point to computer literacy as a hopeful trend. Lots of software would be better if it was designed by the people who will use it and computer literacy will make that more likely. That scenario would please both users and vendors, he said.

The biggest changes Vyssotsky sees coming over the next five to 10 years involve the introduction of sensors and controllers on user premises. These devices will perform such building management tasks as energy control and fire detection.

Vendors will have two choices in availing themselves of this market. First, they will be able to "climb on the bandwagon" and supply products developed by users, or second, they may provide generic interfaces that allow the new generation of products to interface with each other, he said.

"Once we have the ability to hook up relatively arbitrary sensors and controllers, and we do now, the users can take over and it will change the way we think about telecommunications," Vyssotsky declared.

The area of photonics is providing users with lightweight optical fiber technology. He noted how the diminutive bulk of glass fibers alleviates the "gunk" and congestion that older wiring causes under city streets. Optical fiber may run all the way to user premises in five to 10 years if the electronic consumer market burgeons.

IWP to Change Name to Aisp

WILLOW GROVE, Pa. — The International Information/Word Processing Association (IWP) will have a new name June 1, when it will be known as the Association of Information Systems Professionals (Aisp).

A spokesman said the new name "more closely identifies the professional expertise and aspirations of our members as a whole."

The association will create and market new products and services such as newsletters and audiovisual projects that are consistent with the current developments in the DP industry, the spokesman said. Those products and services will be targeted at several special interest groups or divisions of professionals involved with various aspects of information systems, including word processing, integrated systems, technical specialties and education and training.

The International Information/Word Processing Association is located at 1015 N. York Road, Willow Grove, Pa. 19090.

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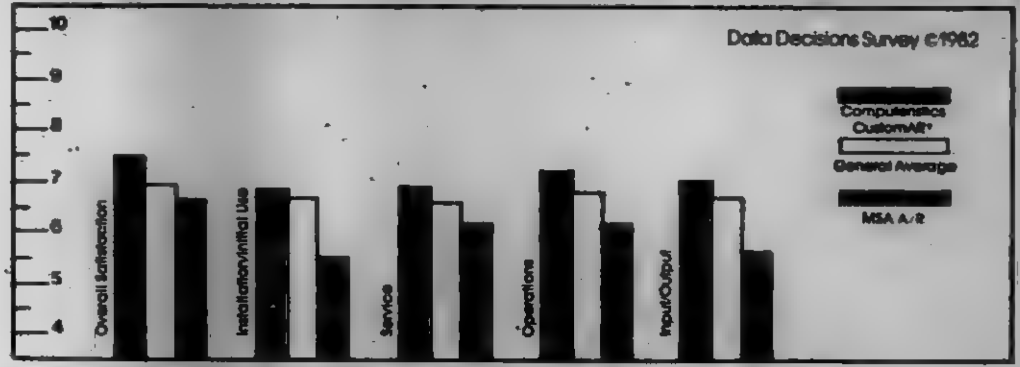

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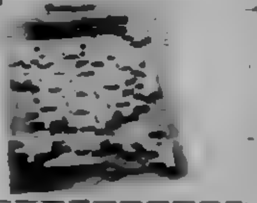

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Cami QA Interest Group To Meet March 22

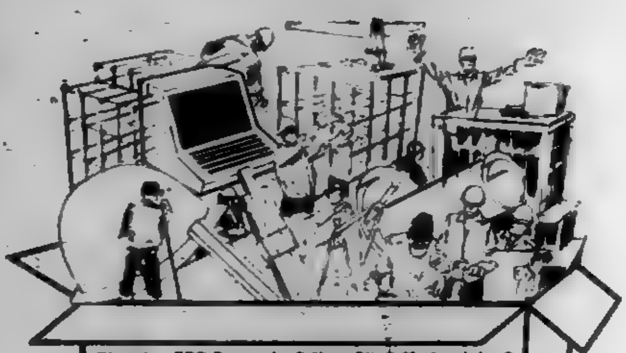
DALLAS — Computer-Aided Manufacturing-International, Inc. (Cami), a nonprofit research group sponsored by industrial, governmental and educational members, will hold an open meeting of the Cami Computer-Aided Quality Assurance Interest Group here March 22-25.

Participants at this meeting will identify and define specific quality assurance (QA) areas for jointly funded development work.

Also, the group will address the development of specification requirements for a universal high-level language for QA equipment and make plans for interfacing with other standards organizations to promote the establishment of a language standard.

Registration for this conference is $175 for Cami members and $195 for nonmembers, according to a spokesman.

Further details are available from Cami, which is based at Suite 1107, 611 Ryan Plaza Drive, Arlington, Texas 76011.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Buchsbaum to Keynote

Optic Meet Scheduled for Feb. 28

WASHINGTON, D.C. — The annual meeting on Optical Fiber Communication (OFC '83) will be held in New Orleans Feb. 28 to March 2. Cosponsored by the Optical Society of America and the Quantum Electronics and Applications Society of the Institute of Electrical and Electronics Engineers (IEEE), the show will feature 100 technical papers on the subject of fiber optics and more than 60 exhibits of hardware in operation.

The keynote speaker will be Dr. Solomon J. Buchsbaum, executive vice-president of Bell Laboratories and chairman of the White House Council on Science and Technology.

The registration fee for the conference is $150 for members of the Optical Society of America or the IEEE. Fee for nonmembers is $170. The charge for students is $50.

Further information is available from John Rhea at the Optical Society of America, 1816 Jefferson Place N.W., Washington, D.C. 20036.

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Does DP Function Separation Work?

Turnaround Time

By Larry E. Long

Q As manager of the applications software maintenance department of a major corporation, I take exception to your comments in regard to DP functions (maintenance and development) being separate. I have worked on both sides of the issue and am convinced that the only way to control the maintenance function is to divorce it from development.

A separate maintenance department lends uniformity and structure to new systems, standards and documentation. How many DP shops have we all seen, heard and/or read about who never quite get around to documentation? How many DP shops accomplish very little, if any, new development work because their entire staff is performing maintenance?

It takes a special type of person to handle the pressures and rewards of maintenance. These individuals are not merely looking for a soft data processing cubbyhole in which to write code, but a challenging career and a learning experience.

Where would you want to be when a company (any company) begins to have bottom line problems: working in new development on the next crackerjack whizbang "state-of-the-art" market evaluation system or maintaining the accounts receivables system which monitors all monies into the corporate coffers?

A Your argument has not convinced me to reverse my position that "maintenance is simply a post-implementation extension of development." An information system is by nature dynamic — constantly growing and maturing. A system may be implemented, but it's never finished.

There should be instilled a sense of responsibility on the part of the creators. I feel that the mere existence of a maintenance staff causes development people to be relaxed in this important responsibility.

Members of the development project team gain insight and in-depth expertise in the area of the system. Even the most competent team of maintenance personnel may never have the opportunity to acquire this overview knowledge and apply it to the maintenance function. After implementation, the documentation is transferred, but a substantial investment in system awareness stays with the development team.

Your organization has had enough foresight to push aside the "stigma." It is, however, a real career consideration and must be viewed in a broader context than your organization.

These are a few of the reasons why I believe the development and maintenance functions should be integrated. I would be interested in hearing how others have resolved the maintenance/development organizational issue.

Q When reading "How to Get the Entry-Level DP Jobs?" I found it amusing that even in the high-growth DP industry, employers are still not interested in college graduates or anyone without two or three years of "experience."

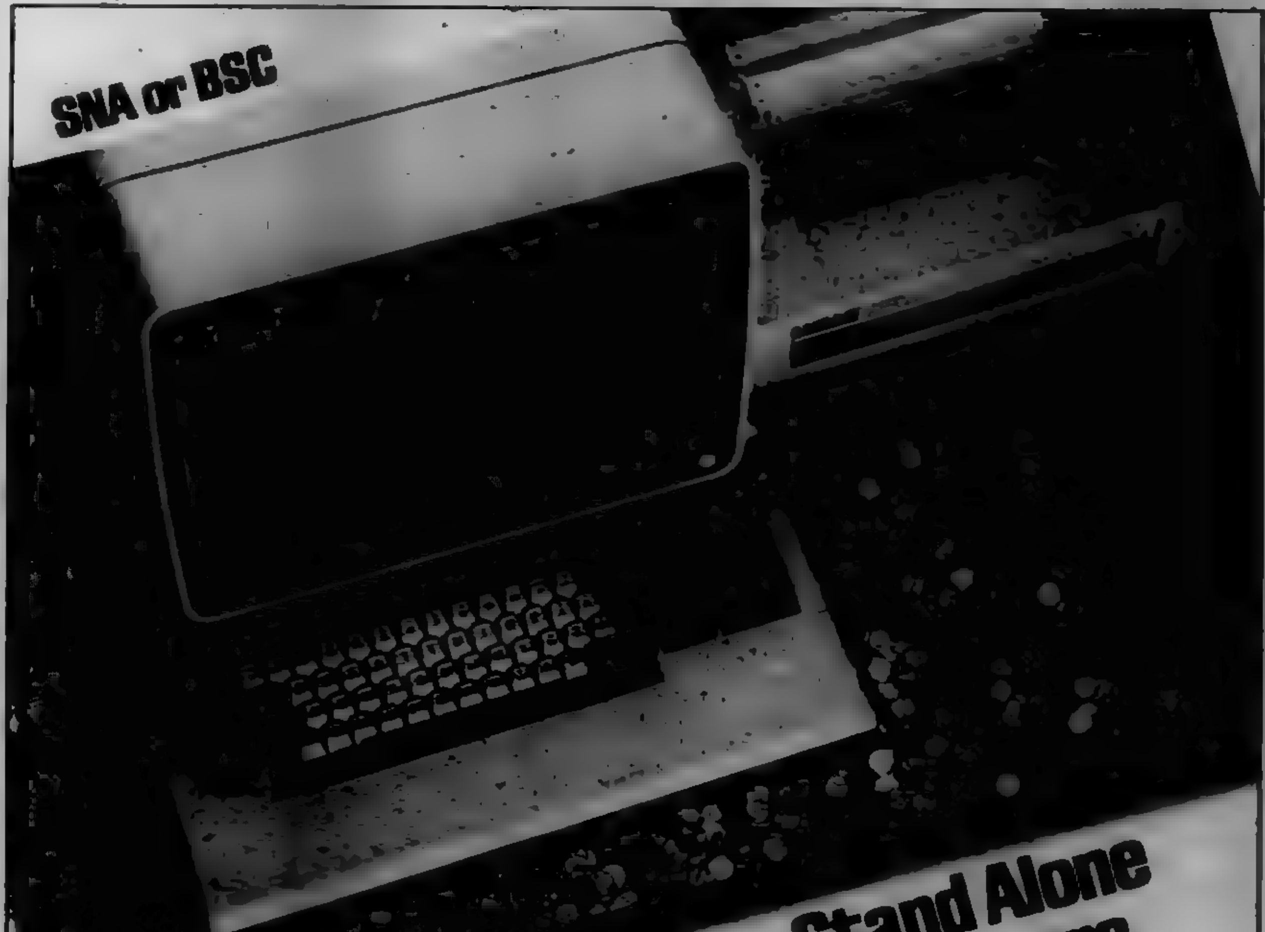
I entered the DP field about four years ago when I returned to college. I attended classes during the day and worked in a management information systems department during the weekends. When no one else applied for a job opening after six weeks of advertising, I got the job. The ad read: "two years' minimum college experience, two years' experience minimum need only apply." I was in the first semester of a two-year course in college. The "experienced" people already had jobs.

A I am no longer amused that employers are overlooking recent graduates. Industry has an implied responsibility to contribute to the pool of experienced workers. Unfortunately, many companies are reneging on this responsibility and the "experienced" pool is dwindling.

There exists a large pool of quality information systems and computer science graduates that need to be fed into the system to generate this all-important experience. Moreover, it's downright cost-effective to hire quality entry-level people.

To cope with a dwindling pool of experienced workers, employers have lowered their standards. For 60% to 80% of the cost of a mediocre programmer with two years' experience, a company can recruit a top graduate that, within a few months, can easily outperform a marginal employee with experience.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*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Firm Installs DBMS, Clears Way for Info Center

SANTA MONICA, Calif. — General Telephone of California (GTC) wanted to institute an information center early — before the demand from DP users for such a system became overwhelming. However, getting senior management behind such a program and finding the right data base management system (DBMS) to make that information possible was the problem.

According to Arvin Mayberry, manager of information access at GTC, the software would have to run on-line with the company's IBM 3033 and Amdahl Corp. VS mainframe systems. It would also have to be compatible with ASI Co.'s ASI-ST software.

Other criteria for the DBMS were general applicability, a user-friendly interface and a proven track record, Mayberry explained.

Extensive Evaluation

After an extensive evaluation and comparison of systems, GTC selected Ramis II from Mathematica, Inc. Mayberry said Ramis II was chosen because of its "cost-effectiveness and because it provided all of the features that the company required."

These features included ease of use, ability to develop applications quickly and ease of training users, Mayberry said. "In addition, the software had already achieved a record of success at GTE Automatic Electric," a sister company.

That success helped Mayberry get a commitment from senior management for the information center project, he added.

The pilot project GTC selected used existing data from the company's corporate personnel system. New capabilities for departmental position budgeting were added with Ramis II's application prototyping features. With the help of Mathematica's Product Group, GTC was able to bring the new system up in less than three weeks and demonstrate it successfully to senior management, Mayberry said.

Benefit of DBMS

"The benefit offered by a DBMS should be that it permits horizontal activity — the sharing of data across normal departmental boundaries," Mayberry remarked. "GTC's previous production systems were developed using [IBM's] IMS data bases, but they were still essentially vertical in nature, developed by and for specific departments.

"With Ramis II, the company expects to be able to relate data across multiple sources and relate applications across multiple departments," Mayberry concluded.

Fose Slated For March 14

WASHINGTON, D.C. — The seventh annual Federal Office Systems Expo (Fose '83) will be held here March 14-17. The conference and exposition will feature 700 exhibit booths and 150 companies.

The conference theme is "Office Systems Integration: Myth or Reality?" It will feature 61 technical sessions, a keynote address by Joseph L. Laferrera Jr. of Bell Laboratories and an address by James Martin, noted computer and communications authority.

The registration fee is $225 before Feb. 10 and $250 after that date, according to the conference sponsor, National Trade Productions, Inc., 9418 Annapolis, Md. 20706.

Book Covers Atari 400, 800

LOS ANGELES — The Book Co., a division of Array, Inc., has announced *The Book of Atari Software*, a 349-page review of Atari, Inc. 400 and 800 processors.

The book consists of reviews of Atari packages, conducted by independent reviewers on a scale of A to F, the firm said.

The book costs $19.95, the firm said from 11223 S. Hindry Ave., Los Angeles, Calif. 90045.

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Enters New Age

Electric Co-Op Beats Backlog With System

QUITMAN, Texas — As East Texas grew over the past four decades from a collection of small farms to an area of subdivisions, factories and refineries, so also did the customer base of the Wood County Electric Cooperative.

The power lines that once carried electricity almost exclusively to milking machines and low-wattage light bulbs now criss-cross nine counties. Billing for electric usage and managing the increasing power loads can no longer be handled with a pencil and adding machine.

By 1969, the co-op's work load expanded into the computer age, and it began using a computer service bureau to meet its billing and power management requirements.

"That didn't work out, so we leased an IBM System/3," said Tom Hollingsworth, the co-op's data processing manager. "But we outgrew it, and put in a System/38 in 1980."

Hollingsworth, who was a long-haul trucker for six years before taking over the DP chores at the co-op, described the System/38 as "darned near idiot-proof," explaining that its ease of use was the primary reason for the co-op's buying the system.

"It enables us to have big computer power without paying big computer prices," he said. "The operating system was designed for the [System/38], thus making it relatively simple to operate."

Customer billing is a major DP function at the co-op, where the billing department sends out monthly statements but staggers the mailings so that only 4,000 of the nearly 16,000 bills are mailed each week. The billing calculation run is performed at night on the computer and saved or spooled so that the bills and related reports need only be printed the next morning. As a result, users in various departments never have to queue for computer time to transact normal, everyday business, Hollingsworth said.

By processing long batch jobs at night, the DP staff avoids a situation where a customer comes in during business hours to see how much he owes and cannot get the information he seeks because the system is tied up, Hollingsworth remarked.

For example, in the precomputer days, a co-op customer might come in inquiring about a refund check he said he never received. "We'd have to search through the canceled checks. If the check was written 15 or 20 years ago, it might take a week, but we'd find it," Hollingsworth said.

"Now, in a response time of three seconds or less, the computer tells the clerk the check number. The clerk can pull not only the canceled check, but also a complete billing history on the account. That's satisfied many an angry customer in a hurry and left him feeling better about the way his co-op is being run."

The computer system tells the co-op how much electricity is crackling down which power lines, enabling maintenance crews to reroute certain lines during peak load times. The system also showed the co-op that the small, gas-saving pickup trucks the company had used are not as efficient as full-size trucks when faced with the pounding they get on the gravel back roads and pastures of East Texas.

In all, the System/38 suports 23 CRT terminals and two matrix printers. Mass storage is accomplished by two IBM 3370 disk drives, with total storage capabilities of 2M bytes of memory.

Training Classes Cover 4300, CICS

BOSTON — The Education Services Division of Rendeck Corp. has developed a range of on-site training courses for both new and experienced IBM 4300 and CICS users.

All the courses except one are held on-site. Each course may have up to 20% of its content customized to meet the specific needs of the user site, Redneck notd.

The courses are "Vsam for DOS/VSE Cobol Programmers," "Introduction to DOS/VSE," "DOS/VSE Job Control" and "CICS/VS Command Level Programming" for DOS/VS(E) or OS sites.

The courses range from one to five days and cost $1,200 to $4,750, Rendeck said from 5 Faneuil Hall, Boston, Mass., 02110.

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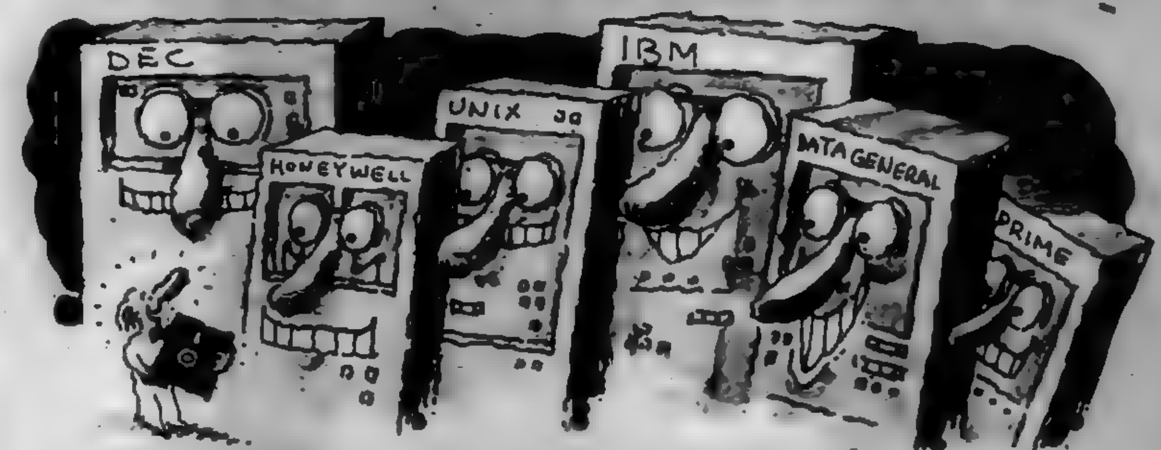

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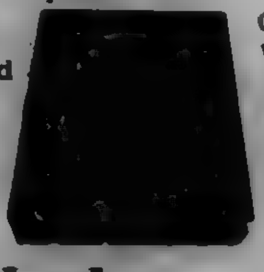

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Bank Tracks Progress With Reporting Service

PROVIDENCE, R.I. — "How're we doing?"

That is the question a bank here asks itself each month by using an automated reporting service of the same name. The system was installed to improve communication between the data processing system and its users and keep track of overall DP performance.

The service was part of an effort to institute management control systems and procedures begun by Mark Marcantonio, the bank's vice-president of data processing. In late 1981, Marcantonio and his managers met with representatives of Mathews and Co. (MCO), a Darien, Conn.-based DP management consulting firm. The latter firm's president, Dick Matthews, suggested the use of "How're We Doing?" which is being used by about 50 organizations nationwide.

Problems, Satisfaction

The service entails the documentation of problems and the reporting of satisfaction, reflecting users' assessments of the level (on a scale of 1 to 5) of DP service they are receiving.

Input from users is reviewed monthly by a liaison officer to confirm the ratings prior to forwarding the data to MCO for processing of the individual client and comparative statistical reports. The reports are sent to the liaison officer for distribution and review by designated company personnel.

Louis Buonaiuto, formerly assistant vice-president and head of computer operations at the bank, was assigned responsibility for implementing "How're We Doing?" and acting as liaison officer. Recently he has been put in charge of loan and investment services for the bank.

Survey Made

The MCO service was implemented in April 1982. Prior to that time, an improvement opportunities survey was made to reflect the existing performance of the DP department and thereby provide a base for later measurements in the use of the service.

The survey revealed that performance criteria received the highest number of complaints by users. In order of importance, these were response time, timeliness of reports, distribution problems and response to problems according to Buonaiuto.

The most significant part of the survey dealt with the bank's objectives for 'How're We Doing?" he explained. These goals included beginning the project with an above-standard rating of performance — a "3" — and working for improvement of this rating; increasing the quality of the report distribution function by at least 10%; and improving communication with users.

More than 60 bank employees were involved in a two-day orientation and training session for the project. They represented senior management, several user departments and data processing.

Personnel Assignments

Specific technical support personnel at the bank are assigned to individual applications, and individual systems analysts/programmers are designated as "owners" of the application systems for given users, Buonaiuto explained.

These personnel, as well as appropriate representatives from the user departments, were instructed in how "How're We Doing?" facilitates communication between DP and its users.

As the system was implemented, the reports produced were routinely reviewed at monthly meetings of representatives from applications support and the systems development staff and the primary user contact for each department. Buonaiuto noted that major agenda items acted on at these meetings included issues outstanding from previous meetings, matters impacting the efficiency of the user's operation, criteria showing low levels of performance and assignment of responsibility for the resolution of identified problems.

Goal Achieved

During the seven months the bank has been utilizing "How're We Doing?" it has achieved its goal of being above the standard satisfaction level of "3" from the beginning and has continued above that point for every month, equaling or outperforming the average of all other MCO banking clients for six of the seven months, Buonaiuto reported.

Distribution of output averaged 2.2 for the seven-month period, he continued, adding that this compared with a low of 1.8 that was reported during the first two months of "How're We Doing?" The increase of .4 on a rating scale beginning with 1.0 is equivalent to 50%, compared to the bank's goal of 10%, he noted.

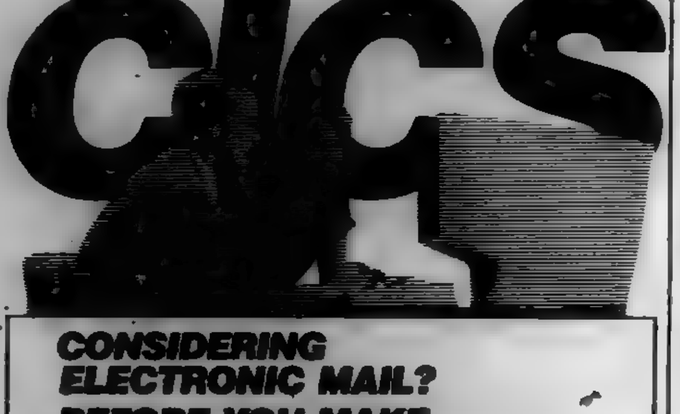
Based on these results, Buonaiuto has purchased a software package to attempt to improve further the quality of the report distribution function.

Other Ratings

DP's results in increasing communication with users can be seen by observing the high ratings given to the Response to Problems and Attitude & Cooperativeness criteria, which showed average ratings of 4.6 and 4.2, respectively.

According to Buonaiuto, these ratings are among the highest of any of MCO's clients within its separate banking and general industry files of data, as well as being significantly above the performance standard of 3.0.

Marcantonio said, "The most significant thing this 'management tool' does is to force communication between DP and users. In the process, it helps solve the biggest problem, which has to do with DP's understanding of the customer's business and the customer's understanding of our capabilities and limitations."



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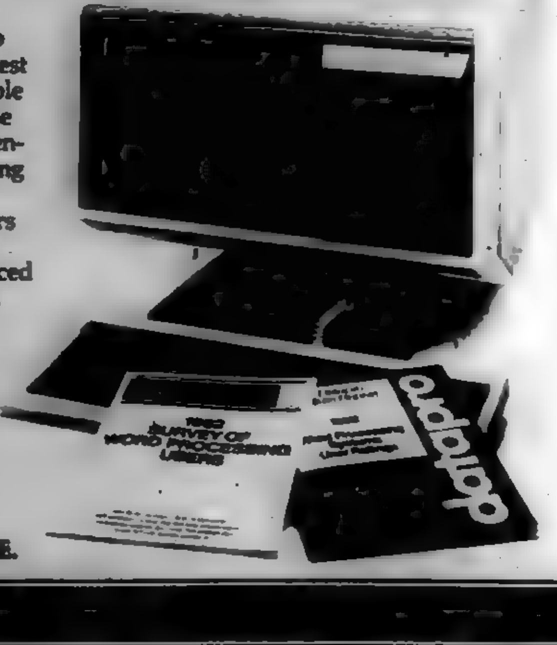

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Processing Language Expedites Auditors' Needs

MINNEAPOLIS — Auditors who need to check records and test facts and figures for consistency, always on the alert for exceptions, need reports too quickly to be able to stand in line until data processing reaches their request.

McGladrey Hendrickson & Co. here decided to install Informatics General Corp.'s Mark IV processing language to write, test and execute their own programs based on data services provided by the vendor.

"With high-level software from the data service and a little training, auditors in our local offices have been able to do their own data manipulation, rather than waiting for reports to come from the main office," Keith Phillips, director of information resource services for the firm explained. Auditors receive about 1½ weeks of training in the use of Mark IV, along with a short period of related computer training.

"Mark IV not only is a powerful language, but also can be simple to use. That's why we were able to do some customizing so that an auditor simply selects from a menu of functions," Phillips said. "The auditor doesn't need to know anything about the operating system and doesn't need to worry about the job control language. That's all handled automatically."

McGladrey Hendrickson usually conducts audits once a year for each of its clients — companies that range in size from small local retail stores to large publicly traded corporations.

In its search for exceptions, items selected from audits for financial institutions for confirmation are randomly chosen from the full file of information. The data is drawn from the client's files and processed at the Informatics data services operation in Fairfield, N.J. From this data, reports are generated for the auditors' inspection.

The Informatics data center processes information on a National Advanced Systems, Inc. AS/9000 mainframe that is linked to Digital Equipment Corp. Decwriter terminals in each of the McGladrey Hendrickson regional offices. In addition, a leased line connects Informatics data centers in Fairfield and Columbus, Ohio, directly with McGladrey Hendrickson's main computer, an IBM 4331 in Davenport, Iowa. This on-line connection acts as a high-volume entry journal to prepare reports from files on loans, savings accounts and sometimes on property and equipment.

McGladrey Hendrickson purchases remote computing services from Informatics based on a combination of the time connected to the data center computer, CPU runtime and the number of I/O operations processes.

"Currently we are looking for ways to execute more jobs on our own computer in Davenport while we continue to draw data from the Informatics services," Phillips said. "We have purchased a Mark IV package from Informatics for the in-house installation and plan to set up a system to distribute administrative information to the regional offices as well as audit files. That way each location will have more control over office management and internal accounting, functions which are presently handled only by the main office."

Tutorial Text Out From IEEE

LOS ANGELES — A tutorial text entitled *Structured Testing* by Thomas McCabe of McCabe and Associates has been published by the Computer Society of the Institute of Electrical and Electronics Engineers (IEEE).

The collection of technical papers describes structured testing and presents techniques and methods. Topics include the role and importance of testing, levels of testing, software complexity, measurement of software complexity, structured modularization, effectiveness and reliability of the testing environment and software maintenance.

The price is $15 for IEEE Computer Society members and $30 for nonmembers from the IEEE Computer Society, P.O. Box 80452, Worldway Postal Center, Los Angeles, Calif. 90080.

Common Designs Formal 4300 Project

CHICAGO — The IBM users group Common will formally develop a 4300 project within its organizational structure.

Formal structuring of the 4300 project will take place during Common's Spring '83 conference, scheduled April 10-14 at the Amfac Hotel and Resort in Dallas. Attendees who happen to be 4300 users will be asked to offer suggestions to help structure the 4300 program.

More information is available from David Lister, Administrative Director of Common, 435 Michigan Ave., Suite 1717, Chicago, Ill. 60611.

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Subcontractor Cuts Costs With WP-Based System

PARAMUS, N.J. — By taking a "bottoms up" approach, a worldwide government subcontractor here was able to cut costs and increase productivity by switching to a word processing-based telecommunications system.

Originally set up to service ITT equipment, ITT's Federal Electric Corp. (FEC) has grown into a worldwide service and maintenance organization with projects as far away as the North and South Poles. Its 5,000 engineering, technical and support personnel design, construct and manage projects that range from communications networks to DP systems to television and broadcasting installations.

Burgeoning communications costs and a need to transmit information quickly from one location to another were key reasons that led FEC to look into office automation, according to Willam D. Henry, FEC's manager of office information systems. Based on recommendations from company project managers, who suggested improved communications as a way of improving overall company performance, "we looked at word processor-based telecommunications to transmit data interactively so that people in Paramus could receive, modify and return documents without spending thousands of dollars on telephone calls and travel," Henry said.

At the time, FEC was using a facsimile copier system, which Henry described as "archaic and not cost-effective." Noting that copies were illegible 60% of the time and often had to be retransmitted, Henry said a 40- to 50-page report could take all day to transmit.

FEC turned to Wang Laboratories, Inc. primarily because ITT's world headquarters and several FEC subsidiaries already had Wang systems installed. The installation chosen, a Wang Office Information System (OIS)/140, handles WP at FEC's corporate head quarters here, as well as electronic document transfer to and from subsidiaries across the country.

The system consists of Wang's Telecommunications software; two terminals; eight archiving workstations distributed over eight locations; a 26.8M-byte system disk that stores up to 10,700 pages of text; and nine daisywheel printers — seven equipped with twin sheet feeders and two with wide carriages. The OIS/140 also includes a bisynchronous option and has the ability to tie into FEC's mainframe, an IBM 4341.

Before designing a cost-effective system tailored to FEC's communications and WP needs, Henry and information processing specialist Debi Gangone conducted an in-house feasibility study, which used two Wang word processors, a System 25 and a System 20. Due to the decentralized nature of FEC, Henry took a "bottom-up" approach with the study. He went directly to the potential users to identify those areas where WP could help them work more effectively.

Wang put on a demonstration for 23 clerical workers, who were then asked to fill out a questionnaire designed by Gangone and Henry to help them project whether WP would enhance the capabilities of a particular department. After prototype word processors were installed, all 42 secretaries spent at least half a day using the equipment in one-on-one sessions with Gangone. Survey results were 100% positive, said Henry, who said he had expected "some resistance to change, but there was none."

Henry attributes the success of the feasibility study to allowing end users to participate in the decision making process. "Not only did it allow us to gather more accurate and meaningful data, but it also led to a more positive attitude among the clerical staff.

Word processing has brought about a "definite increase in productivity," according to Henry, and the use of OIS for text editing has far outstripped earlier projections. The system's telecommunications ability has produced cost savings as well as reduced the amount of time required for some transmitted projects, he noted.

Duo Receive Cause Awards

BOULDER, Colo. — Carl J. Gochenour, retired director of administrative processing at the University of Iowa, and Joe B. Wyatt, chancellor at Vanderbilt University, are recipients of 1982 Recognition Awards from Cause, the Professional Association for Development, Use and Management of Information Systems in Higher Education, the organization announced.

Gochenour received the Cause Award for Professional Excellence in recognition of outstanding professional contributions to the administrative information services (AIS) field, a spokesman said.

Wyatt received the Cause Award for Exemplary Leadership for his advocacy and support of AIS in higher education.

The $1,000 scholarships which accompany the awards will go to the University of Iowa Foundation and to Vanderbilt University, the spokesman said.

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General Exposure Program The Rule at Prep School

CHATTANOOGA, Tenn. — Creating an environment in which students "can learn independently and personally how to converse with a computer to get useful work done" was the driving force behind the installation of a $150,000 computer system by a private boys' preparatory school here.

The Baylor School began its program with a Data General Corp. Nova 830 system. However, student demand exceeded the availability of terminals and disk storage space for programs. The school decided to upgrade and selected a Hewlett-Packard Co. HP 3000, with the help of T. Cartter Frierson, an independent consultant based here who also is an alumnus of Baylor.

Frierson urged the school "to strive for a general-exposure program for the entire student body, as opposed to a mathematics-oriented course for a few whiz kids and those interested in a data processing career." He stressed the importance of developing homework assignments and laboratory exercises to be conducted at a computer terminal.

The program, therefore, was designed to aid students in whatever college major they select and to prepare them for various career paths.

System Configuration

Baylor's new computer system has 14 terminals, including three dial-up ports and a terminal with the capability of transferring student programs to and from cassette tapes. Two line printers are available, one with a print speed of 400 line/min and the other printing at 180 char./sec. A magnetic tape unit for system backup and software updates also has been added. The system supports Basic, Cobol and Fortran, all of which can be learned by students through self-teaching programs on the system itself.

Daniel Kennedy, mathematics department chairman, coordinated the project along with mathematics instructor Lewis Rush. He explained that the school has undergone several years of preparation to achieve its current extensive computer program. He said that many schools that utilize computer programs make the equipment available only to students who sign up for it and pay a user's fee. At Baylor, all students can use the computer without special arrangement or fees.

"The goal is to have students comfortable in programming a computer for their individual purposes. For example, biology students are using the system for ecological investigations. Physics students are using it for experiments in astronomy and genetics. Writing composition classes are using it for construction and editing papers," he continued. "The possibilities are endless in all areas of learning.

"In addition to class assignments, lab projects and homework, the young men also gain a lot of valuable experience by using the system for entertainment such as writing programs for new computer games," he said, noting that some Baylor students experimenting with banking programs and other business projects have gone on to use this experience in writing programs for hospitals, schools and businesses.

"Controlling a computer by understanding machine 'thought' and being able to program its response is like mastering another language," Kennedy explained. "As in mastering French, Spanish and other languages, it has been proven that the younger the student is, the more easily he will learn the new vocabulary and the more fluent he will be in using it. It is exciting to see seventh graders becoming involved and very comfortable conversing in the various computer languages."

Shown with the HP 3000 Series 30 at Baylor School are (from left) Lewis Rush, T. Cartter Frierson and Daniel Kennedy.

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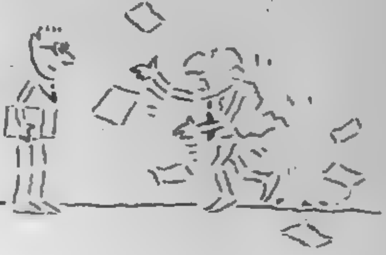

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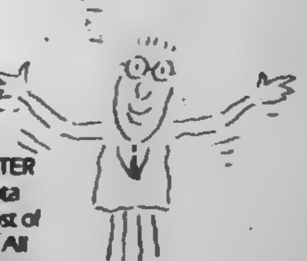

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Shared Library Beats High-Tech Tower of Babel

SACRAMENTO, Calif. — It might be compared to a latter-day, high-technology Tower of Babel.

Software updates, written in a variety of formats, were arriving at a service bureau here from a variety of vendors. The service bureau tried to keep up with these modifications, but had to integrate them into a number of home-grown modifications. The result: a headache for the firm's DP staff.

"For much of our purchased software we have a base version, modifications and updates from the vendor and modifications of our own," said Larry Ames, vice-president of FB Data Services, a DP subsidiary of the California Farm Bureau. But, "managing the source programs from vendor-supplied applications systems was our biggest problem." Ames said it is crucial for FB Data to keep the modifications separate for evaluation purposes.

The four-year-old service bureau employs 60 programmers writing applications on an IBM 3031 running VM and an IBM 4331 Model Group 2 under MVS. Source program management facilities are handled under VM/CMS in a time-shared mode.

Range of Formats

Maintenance problems were also complicated by the range of formats used by vendors, from Pansophic Systems, Inc.'s Panvalet to IBM's IEBUpdate to updates written on paper, Ames said. FB Data had adopted Panvalet for source-library maintenance, but found efficiency was hampered by dissimilar formats and the necessity to maintain it manually. Also, many Panvalet functions were available only in batch, Ames said, a fact that did not sit well with the programmers, who preferred the speed of CMS.

"Our central Panvalet libraries soon became out of synch with what existed in CMS because putting things back in these libraries was considered by the programming staff as an unnecessary extra step," Ames said. FB Data management decided a shared library management facility was needed.

"CMS has very good source program updating facilities, but IBM doesn't give us the capability of having a common library shared by several programmers," Ames said. "Under native IBM, there's nothing to prevent two programmers from updating and changing programs at the same time."

Not wanting to switch its CMS orientation, FB Data settled on RD/Share, a shared library facility from RD Labs of Sacramento. "This package allows us to establish up to 50 controlled libraries," Ames said. "It gives us checkout and check in control over programs and provides an audit trail of who is working on what."

Centralized Control

RD/Share centralizes control of shared facilities and prevents two programmers from working on the same program concurrently, Ames said.

"RD/Share runs as a disconnected virtual machine," he said. "All controlled libraries, file and directory formats, access methods and virtual machine protocols are completely standard so that CMS utilities, programs and editors can be used. Since it has been easy to learn and to use, our programmers use it extensively."

The most recent application of shared libraries for the company is for CMS-based date entry applications, such as their production backlog tracking system. "Each production manager and supervisor uses programs that run in CMS to enter daily work-in-process information," he said. "This distributed data entry system uses a shared library to collect and control the transactions."

Source management has been a constant problem in DP shops, he said. "That's particularly true as users move toward more vendor-produced software in which you have updates and changes coming from more than one direction."

"Tools like RD/Share are helping us to build a base for continued use of CMS."

Credit Goes to Indoor ATMs

Bank Claims 80% of Transactions Automated

SAN FRANCISCO — An automated banking facility in which computers perform almost 80% of teller window transactions? While it may sound farfetched, such a system is currently being tested here by the Crocker Bank.

The automated branch, located on the ground floor of a downtown office building, consists of two IBM 3624 automated teller machines (ATM), a customer-operated terminal to check account balances and a two-member staff equipped with display terminals linked to computer records at the bank's main office.

Bank officials said the new concept was designed to expand service and convenience, reduce customers' waiting time in lines, while at the same time hold down some of the rising costs of doing business.

Crocker Plans

Crocker plans to launch nine more automated facilities of similar design in the near future, each one tailored to the population needs of its geographic area.

"Only by aggressively seeking customers, determining their needs and providing the kind of service they demand can today's banks stay competitive," said Kacy Calden, assistant vice-president and product manager at Crocker.

"Our research indicates that people enjoy pushing buttons and being their own banker when it comes to teller functions," Calden continued. "The ATMs, in service from 6 a.m. to 1 a.m., provide about 80% of teller window activities. They are fast and accurate and provide clear audit trails."

Besides Cash

Besides dispensing cash, the ATMs accept deposits, allow withdrawals and give balances on savings and checking accounts and transfer funds from one account to another. Credit card and loan payments are also processed.

While Crocker has 250 ATMs installed in outdoor locations performing basically the same functions, those in the automated branch are indoors in a regular banking atmosphere.

The banking specialists that man the otherwise computer-driven branch work weekdays from 9 a.m. to 4 p.m. Using IBM display terminals, they help customers open new accounts, quote current money market rates, take loan applications, assist with the ATMs and discuss the bank's services and product offerings.

Ethel Daly, Crocker vice-president and manager of electronic banking, claimed the machines have made new teller careers possible and have led to enhanced job descriptions.

"For example, human tellers, freed from the often tedious task of dispensing cash to long lines of customers, can learn more about the growing list of the bank's products and services," she said. They can also spend more time helping customers with specific problems without feeling pressured by others waiting in line, she said.

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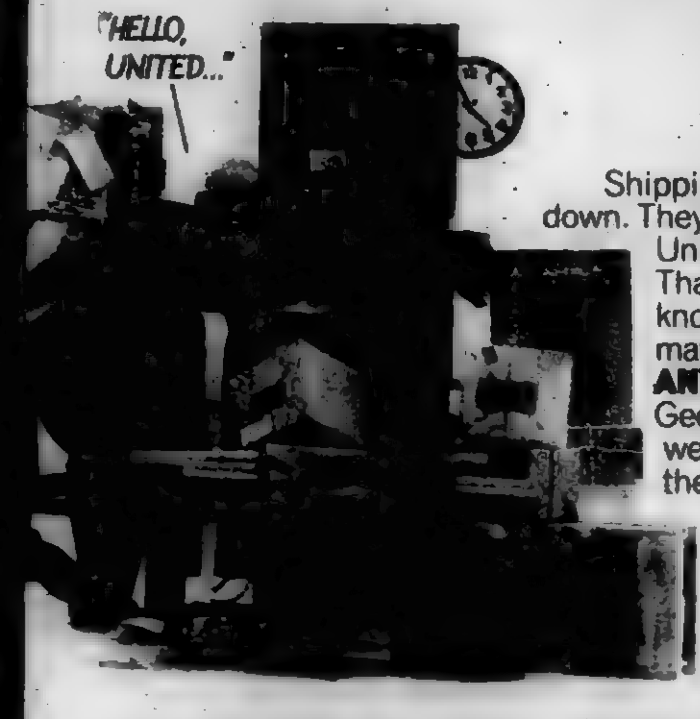
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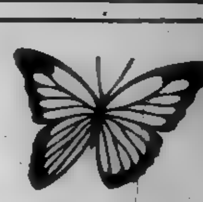

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Laundry Firm Cleans Up With Financial System

HOUSTON — Running a cleaning business isn't all solvents and soap. With that in mind, a laundry and dry cleaning establishment here has turned to automated data management in its efforts to reach projected annual sales of $5 million by the mid-1980s.

The second-largest single-plant cleaner in Houston, Imperial Laundry & Cleaners, Inc., decided to install an interactive data processing system to streamline most of its business operations within a year, despite a sluggish economy and soaring interest rates. However, to make the kind of growth he was aiming for both feasible and profitable, company President Gayle Page felt tighter controls were needed for financial management, daily operations and planning.

Imperial had taken some steps toward automation with NCR Corp. Imos software in 1978, when an NCR 8231 minicomputer was installed. A need for expanded data processing capabilities, along with more sophisticated programming tailored to the firm's specific needs, led Page to begin working with a local software organization on the development of general accounting and management information programs. The systems developed include payroll, accounts receivable and payable and fixed assets, all of which interface automatically with the general ledger system.

NCR 6420 Printer at Imperial Laundry & Cleaners

In December 1981, Imperial upgraded to an NCR I-9020 mini with increased disk capacity, which provided greater compatibility for interactive data entry and retrieval. This configuration included three NCR Model 7900 CRT terminals, two Model 2950 general-purpose terminals with integrated cassettes and a Model 6420 300 line/min printer, all running on an Imos-V operating system.

Program Development

Page personally developed the programming in addition to selecting the DP system. Criteria for the latter included migration path engineering to allow Imperial to expand its computer system to meet its changing needs. The system was built in accordance with generally accepted accounting principles, according to Page, but with Imperial's own peculiarities built in. "I . . . wanted to be able to develop software programs that suited Imperial to a 'T' and not [have] to modify general packages as was being done initially," he explained, adding that he "wanted complete flexibility and total control, which I now have."

The NCR system is used to process the 2,000 tickets written daily, as well as the over $1 million payroll. The minicomputer provides detailed information on labor costs per department. Because the system works programmatically, arithmetic, keying and clerical mistakes are all but eliminated. In fact, the system handles everything from choosing cost-effective delivery routes to automatic pricing and invoicing to financial reports.

Page stressed that sophisticated accounting and information management control systems are critical when planning to expand. "A company needs controls to ensure that its work force is being utilized in the most productive way." He estimated that three to four more people would be needed to handle accounting functions without the system. On that basis alone, Imperial will recover its full investment several times over during the next five years.

Also, the number of shipments sent in error has been cut, with resulting claims running at below one-tenth of 1%, considerably less than the industry average.

The real payoff, however, is enhanced management, Page noted. "The NCR I-9020 is invaluable when it comes to forecasting needs and inventory management. Computer systems should enable management to best capitalize on its cash flow," he said.

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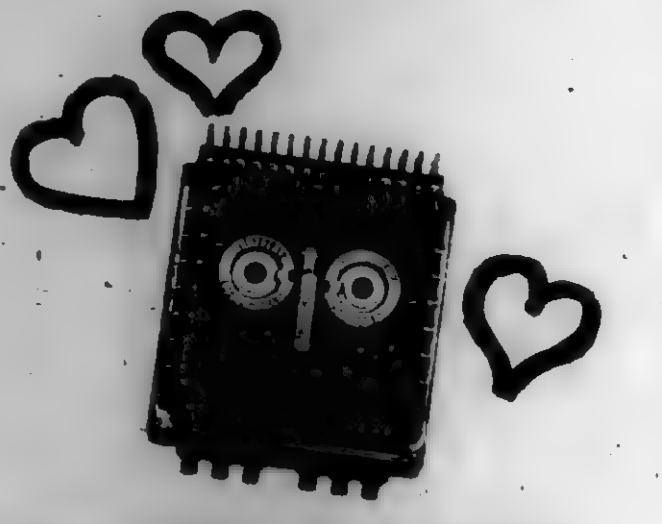

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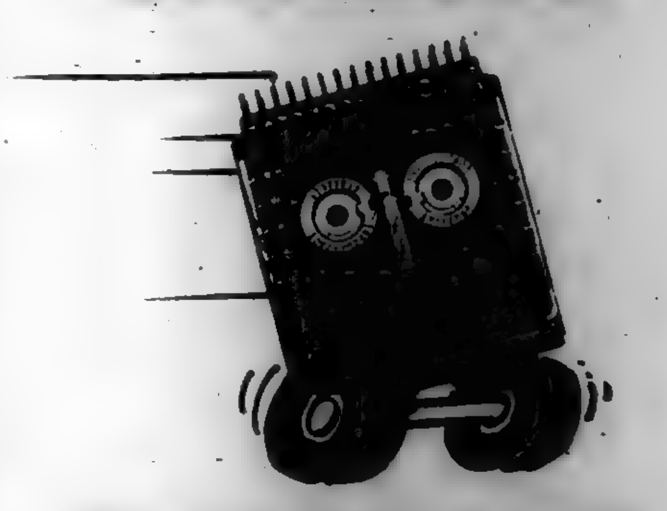

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Law Firm Adds Interface, Printer to In-House Net

NEW YORK — In the office of a major Wall Street law firm an attorney busily prepares a brief for an upcoming case. As part of the research, a secretary uses a computer terminal to call up documents from similar cases the firm has handled.

Based upon instructions from the attorney, the secretary chooses, modifies and merges several paragraphs from the documents selected with the copy already written, then enters the command to print.

Scenarios like this are commonplace at the law firm of Davis Polk & Wardwell, which uses a Xerox Corp. 9700 electronic printing and data processing system. The firm has used computers since the late 1960s, and was among the first to employ magnetic card and tape typewriters in its operations. In the mid-1970s, the firm became one of the first to install an in-house shared-logic minicomputer word processing system.

By the late '70s, however, the limits of this equipment were apparent. The magnetic typewriters were swamped and the minicomputers were overworked. The law firm began mapping its move to an extensive in-house computer network for the 1980s in which the Xerox printing system now plays a prominent role, according to Robert Hendel, the firm's director of operations.

The Xerox system is built around a core of five interconnected minicomputers. Its components are driven by Bell Laboratories' Unix operating system and supported by Interactive Systems Corp. Unix allows programs to be written for a range of applications from accounting to manuscript editing. On any one of 250 terminals, any one of 350 lawyers and paralegals at the firm could file a document or call up past or current work for reference, Hendel said.

The firm took delivery of its first Xerox 9700 system in 1980. Merging it with the rest of the system was an unexpected challenge. "We discovered that it 'talked' to IBM computers, but not to our own Digital Equipment Corp. PDP-11/70 minicomputers," Hendel said. "We could still use the 9700 system by simple mag taping documents and loading them into the machine's tape drive. This was not enough for us."

So the firm's systems programmers and two outside contracting groups developed a hardware and software interface that has been online for 18 months.

The firm continues to enhance their automated system while watching new technologies. Since the system was assembled, the firm's New York and Washington, D.C., offices have been linked through a communications network. Several employees now have CRT terminals in their homes so they can access any part of they system, Hendel said.

Davis Polk & Wardwell is now waiting for the delivery of a Xerox 1050 graphics input station, which uses a scanner to crop, scale screens for photographs, compresses data, prints labels and transmits graphics to the Xerox electronic printing system where the graphics are merged with text and composed.

Basic Coding Guide Out for Managers

ESTILL SPRINGS, Tenn. — Associated Technology has introduced a coding guide for programming in Basic designed to aid software managers wishing to standardize their department coding practices.

The 42-page guide reportedly provides a comprehensive set of company standards and examples of their application.

The coding standard guide costs $20 from Associated Technology, Rt. 2, Box 448, Estill Springs, Tenn. 37330.

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Firm Trims Program Development Time

SANTA CLARA, Calif. — Rolm Corp.'s data processing staff has reduced the number of Cobol programs it had to write from 78 to 14 and cut in half the development time for its Project Accounting Reporting (PAR) system.

It reportedly accomplished this by installing and using a transaction processing system for use with the firm's many Hewlett-Packard Co. HP 3000 computer systems scattered about the country.

Rolm's difficulties were typical of many fast-growing companies. Typical management problems accompanying rapid growth and frequent new product introductions burdened Rolm as it grew from a standing start to half-billion dollar revenues in a decade. A series of new products fueled the growth. Over $24 million was spent in 1982 and $30 million-plus is planned for 1983, based on annual revenues that could exceed $500 million.

The task at hand was to budget, control and manage long, complex, high-value developments involving large engineering and support teams, with thousands of material line items to be accounted for and controlled.

The firm had been using a monthly batch program on its IBM 4341 to analyze project costs, said Ernie Pope, Rolm project programming manager. "To get data in, all our accounts payable supervisors were required each month to 'redline' items from the payables report for manual transfer into the general ledger by keypunch, proof listing, verification and repunching."

That meant taking managers away from their supervisory roles for a week each month.

The accounts payable problems went beyond batch processing. They also reflected the inconvenience of using entirely separate batch purchasing and receiving systems, operating independently from disparate data not referred to or reconciled via a common data base or activity code.

"Our 4341-based system had simply run out of steam," Pope commented.

After considering several alternatives, Rolm decided to implement the Insight transaction-oriented development system from Computing Capabilities Corp. and designed to run on the HP 3000, of which Rolm had 23 around the country.

Those systems were established specifically to share data base resources and permit managers online, real-time inquiry and update of financial data throughout the organization. Relevant data was passed routinely to the corporate 4341 for batch processing.

"We found that Computing Capabilities had developed a payables package using their own Insight," Pope said. "Because of the nature of the development system, the package was extremely modular, using a single set of transaction protocols. Analysis convinced us that modification of this package, using Insight itself to make the changes, would be cost-effective."

He said that Insight cut the number of Cobol programs that had to be written from scratch from 78 to 14 and let Rolm design and create the other 64 transaction/inquiry systems without programming of any kind. That cut the PAR system creation time in half, Pope added.

"With the newer Insight II, which we received just after the PAR system was complete, we would have had to have written only one of those programs," he said.

Rolm used Insight II for its new accounts payable system, which was completed in about half the time required by the lowest cost alternative, at about half the cost and with the same kind of economies Insight provided on the PAR project, he said.

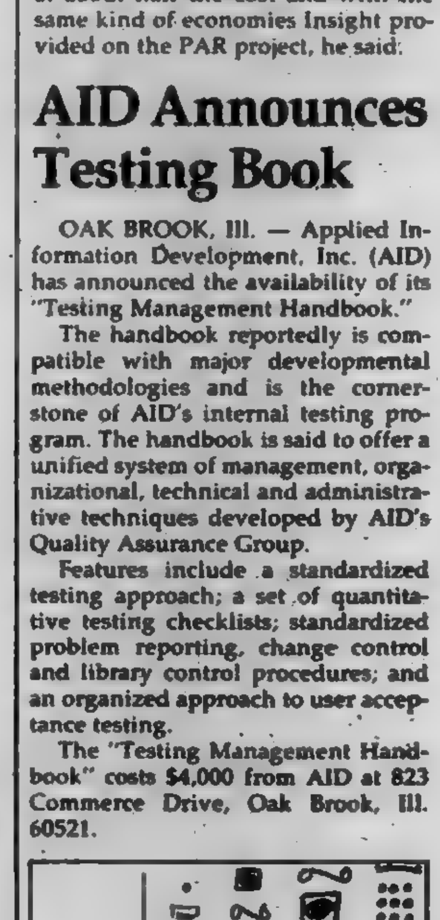
AID Announces Testing Book

OAK BROOK, Ill. — Applied Information Development, Inc. (AID) has announced the availability of its "Testing Management Handbook."

The handbook reportedly is compatible with major developmental methodologies and is the cornerstone of AID's internal testing program. The handbook is said to offer a unified system of management, organizational, technical and administrative techniques developed by AID's Quality Assurance Group.

Features include a standardized testing approach; a set of quantitative testing checklists; standardized problem reporting, change control and library control procedures; and an organized approach to user acceptance testing.

The "Testing Management Handbook" costs $4,000 from AID at 823 Commerce Drive, Oak Brook, Ill. 60521.



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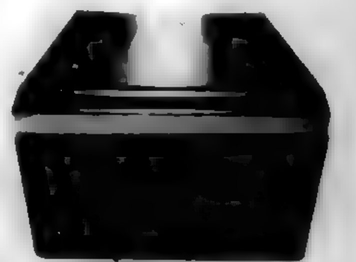

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Packaged System Cuts Publisher's DP Costs 69%

WHEATON, Ill. — A packaged computer system turned out to be a blessing for a publisher of religious materials here. After two disappointing attempts to computerize its ordering and billing operations, Tyndale House Publishers, Inc. bought a packaged system from STC Systems, Inc. of Waldwick, N.J., and cut computing costs by 69% the first year.

Tyndale House is best known for the *Living Bible*, a modern paraphrase of the Bible which is sold in 22,000 stores around the country, according to Operations Manager Brad Jones.

Tyndale first computerized its operations in 1973, contracting with a service bureau that proved to be too small to handle the growth brought about by the popularity of the *Living Bible*. By 1978, the service bureau was charging too much for too little processing, Jones said.

"Management pushed for an in-house system," Jones said. "In our rush, we made some ill-fated and hurried business decisions."

The company bought a Burroughs Corp. B3700 mainframe and an order entry program that was originally designed for the tobacco and candy industry, Jones said. The package and hardware proved unsuitable for Tyndale's needs. Within a year, the company was back in the market for an information system.

"We hired consultants who came up with a whole series of recommendations," Jones said. "One was to set the Burroughs up properly for our needs. But the expense was nearly as high as buying another system."

Another Recommendation

As part of another recommendation, Jones contacted STC Systems, a seller of packaged computer systems for the publishing industry, and arranged to visit some successful publishers, including G.P. Putnam & Sons, Harvard and MIT Presses and observed the STC systems at work. "I was impressed that STC salesmen didn't accompany us on the tours of Harvard and MIT," Jones said. "One person said that indicated they either had a lot of confidence in the product or they were awfully dumb."

Believing the reason to be the former, Tyndale chose Pubs-Data, a packaged system from STC. The package includes a Data General Corp. Nova 4/X, two 80M-byte Control Data Corp. disk drives, a Storage Technology Corp. tape drive and a Dataproducts Corp. drum printer with packaged software developed by STC.

"In both other situations we had to teach the vendors the publishing business," Jones said. "Here, STC already knew publishing. At first I was opposed to changing our way of doing business to conform to a software package. But as I looked into it I found the package had almost everything we were trying to accomplish with the other systems."

Jones said the decision to write off the Burroughs system was difficult, but the cost savings have justified the investment. The department budget for hardware, maintenance, programs and salaries fell to $110,000 in 1981 from $361,000 in 1980, a decrease of 69%. For 1982, the department budget rose to $114,000. The figures include the cost of the system amortized over five years.

Package Applications

The company uses Pubs-Data for order entry, inventory control, accounts receivable, sales analysis and royalties, Jones said. The package's reporting procedure is especially efficient, he added.

Tyndale has now undertaken two projects to speed remote order entry. Within two months, Jones said, two of the company's biggest customers — Waldenbooks and B. Dalton Booksellers — will handle ordering and billing on magnetic tape. Orders from the 1,500 affiliate stores will be entered in each company's central billing office and the tapes sent to Tyndale for processing and order shipment. Each month, Tyndale will send a tape back to the central offices containing the month's billing information. "This will speed up collection and ensure accuracy while greatly reducing paperwork handling," Jones said.

Tyndale is also working on a plan to provide its national sales force of 12 representatives with terminals to allow daily order entry by phone.

MIC Reports Grade DBMS for Micros

CHERRY HILL, N.J. — Management Information Corp. (MIC) has evaluated four data base management systems for microcomputers in its "Packaged Software Reports."

The evaluations focus on Ashton-Tate, Inc.'s Dbase II, Micro Data Base Systems, Inc.'s MDBS-III, Condor Computer Corp.'s Condor Services 20 and Stoneware, Inc.'s DB Master data base management systems.

"Spotlight on Microcomputer Data Base Management Systems" can be obtained for $79 from MIC at 140 Barclay Center, Cherry Hill, N.J. 08034.

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Sharing their insights on OA planning, integration and implementation issues are, among others: Dr. Michael Hammer, associate professor at MIT; Dr. John McQuillan, assistant to the president of BBN Information Management Corp.; Patty Seybold, principal editor of The Seybold Report on Office Automation; and John Walsh, Communications director of Avon Products, Inc.

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Agency Tracks Legislation With On-Line System

CHICAGO — Providing timely information on the approximately 130,000 bills that are introduced and 250,000 actions that take place nationwide each year is a Herculean task for the Commerce Clearing House.

This agency has been tracking legislative activity in the 50 states and Congress for more than 50 years, using General Electric Information Services Co. (Geisco) CPUs on a time-sharing basis for compiling data for daily distribution to clients. However, even this computerization was not enough to handle February and March, the "heavy bill introduction months," when the firm averaged 50,000 computer-generated lines of output per day on 35,000 bill introductions and 100,000 individual actions.

Accordingly, Commerce Clearing House decided to enable its clients to access the entire data base for on-line inquiry through an on-line system available over Geisco's international computing service called the Electronic Legislative Search System (ELSS).

This added service enables the firm to prepare introductory notices of new bills and action reports on ongoing legislation overnight via Geisco's teleprocessing network. Users can select and print only the particular information needed. The data generated by the system during the night is sorted and distributed each morning.

"This is the first time that we have been able to prepare and deliver our products electronically," Donald J. Hill, assistant vice-president of Commerce Clearing House, said. "The system gives our customers a good deal more flexibility, greater opportunity for information and capabilities we couldn't offer until now."

The system was designed and implemented by Geisco's systems development and consulting staff working with Commerce Clearing House personnel. The task comprised close to six man-years of development effort, he explained.

Commerce Clearing House solicited system design proposals from Geisco's Chicago office, as well as from two other external computing services vendors. According to its vice-president, Arnold Coleman, the firm selected Geisco because of the experience of its custom applications staff and its ability to apply the necessary staff resources to assist Commerce with both system planning and implementation.

"The custom applications staff virtually camped out in our offices during the initial design phase. Within a month or so we had a much clearer idea of where we were headed," Coleman recalled, adding that within eight months the first portion of the system was up and running.

Using the new on-line system, Commerce Clearing House customers can define their own searches using a wide range of English-language commands, he explained. Specific bill numbers, subject codes or ranges of subject codes, states, Congress, bill sponsor, dates or activity can all be used in varying combinations.

A user can search the data base using only the subject areas he has subscribed to or use the entire data base, ignoring subscription restrictions. They range from a simple listing of bill number, name and sponsor up to introductory identification and complete bill history.

Customers can further define their searches by excluding both electronic and paper information on a given number of bills, Coleman continued. One customer requested information on 20,000 different bills. A review of his needs, however, showed that tracking just 5,000 bills would accomplish his objectives.

He noted that using ELSS is saving money for Commerce Clearing House clients. If they request their searches overnight, they save 60%. By deferring processing up to three hours, they can save 40%, he said.

Previously, using the "paper product," customers had to post manually all actions to the introductory notice in order to maintain an action history for any bill, Hill said. Searches covering various states and/or subject areas had to be done manually. "Now, with ELSS, these searches can be accomplished in minutes for a fraction of the previous costs," Coleman said.

Gale Releases Edition Of Data Base Guide

DETROIT — Gale Research Co. has announced the third edition of its "Online Bibliographic Databases: An International Directory."

The publication is a specialized directory of bibliographic data bases offered by on-line suppliers throughout the world. The 250-page book provides details on 200 data bases from 40 on-line service suppliers.

The book costs $90 and will be available in March from Gale Research, Book Tower, Detroit, Mich. 48226.

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Announcing Avatar™ TC1, the first Universal Terminal Converter: turns any dumb terminal into a desk-top computer in minutes. And saves money while doing it.

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Bank Cures Downtime Woes With Data Recovery System

DENVER — The fourth largest commercial bank here in the Mile-High City recently installed a data recovery system that it said has overcome many of the problems resulting from hardware and software failures.

Central Bank of Denver (CBD), which has $950 million in assets, implemented the system to protect its critical on-line financial operations against downtime, Steve Kostiuk, CBD's assistant vice-president in charge of data processing, explained. If a "customer comes in and wants to buy a $500,000 certificate of deposit, the customer's not going to stand for someone telling him to come back later because the system is down — he'll go around the corner where another bank will be on-line and waiting for him."

Kostiuk is also looking to the future: "Some banks in the U.S. are already either in production with, or testing, home banking via personal computers . . . When that happens in a big way, no bank that's really serious about providing service to customers will be able to afford being down. They'll lose business, and they'll be seriously handicapped."

Outages cause basically two problems, according to Kostiuk. First, the outage period itself stops processing and interferes with schedules. Second, once a service interruption has been fixed, it takes time to restore data bases and repost earlier transactions.

To alleviate these problems, Kostiuk is relying on Integrity/Data Recovery System (DRS) from Integrity Solutions, Inc. of Englewood, Colo. This system runs with the bank's IBM 4341 Model Group II processors. It reportedly operates as a totally transparent front end to all of the bank's systems, logging each incoming transaction that causes a change to any data base or file.

In the event of a system crash caused either by a hardware or software failure, Integrity/DRS allows the bank to recover without the need for the traditional time-consuming backup, reloading and reporting. "The usual answer is to periodically dump all your data bases to tape, use off-line reportings and so on," Kostiuk explained. "We'll probably still do some of that, but even that's not foolproof."

By transparently storing every incoming transaction for any system, Integrity/DRS provides dynamic step-back, an almost foolproof method of backup that eliminates many elaborate and error-prone restore procedures, Kostiuk said.

"For some reason, system crashes always seem to occur at peak customer service times or in the middle of the night," he observed. "That means a programmer has to spend valuable time driving to the data center.

"It takes time for the programmer to figure out what happened in the first place, he continued, "then hang around while the operations department takes the first steps in recovering.

"With Integrity/DRS, we'll be able to recover by over-the-phone instructions much more rapidly with minimal operator intervention," he concluded.

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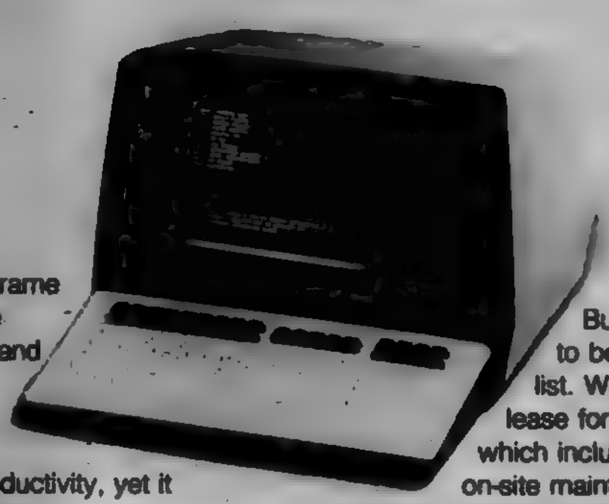

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Firm Stores Seat Styles and Saves With System

BURBANK, Calif. — What is the fashion-conscious airplane seat wearing these days?

Believe it or not, airplane seat covers go in and out of style just like everything else. Weber Aircraft, a division of Walter Kidde & Co., which designs aircraft interiors, decided it might be a good idea to hold onto old seat cover designs by storing them in an IBM 4341 processor.

The company has amassed about 1,750 different styles of seat covers. While only about 300 of those designs are regularly used, the company gets orders from about 15 different airlines each month for seat covers, according to R.V. Greenshields, director of systems and data processing.

In order to produce seat covers, the firm uses cardboard patterns. But storing those patterns was a problem. Because they tend to be large and bulky, the cardboard patterns were hung on long poles, where they could be easily damaged, Greenshields said.

Storing the specifications for the patterns solved the storage problem, but in order to use the computer-stored patterns, Webber needed a way of converting the specifications back to the original cardboard patterns, Greenshields said.

With the current system, a manufacturing engineer traces the pattern with a Numonics Corp. hand-held digitizer, which sends the information to a Cadam, Inc. graphics terminal. From there, the data is converted into a special software package and stored in the 4341, Greenshields explained.

"There is virtually no limit to the number of patterns that can be stored electronically for instant recall. And with the accuracy that the computer provides when duplicating or modifying a pattern, there are tremendous labor and cost savings," Greenshields said.

So far the idea has paid off. Early airplane seats were small and firm. With the advent of super-size jets, seats became more luxurious and more cushioned. Now, Greenshields explained, with more concern for fuel economy, seats are getting smaller again, but have more padding.

"If you look at a wide-bodied plane with nine seats across, you'll notice that the designs are more colorful and varied. You'll see florals mixed with geometrics, all coordinated for a visually pleasing effect," Greenshields said.

Videoconference Set for April 19

NAPERVILLE, Ill. — "The Information Center Revolution," a three-hour videoconference, will be conducted here by Deltak, Inc. on April 19.

This conference will be broadcast live via satellite from Deltak headquarters to audiences in 14 U.S. cities. It will feature a "how-to" discussion on information centers led by industry guru James Martin. Interactive questions and answers between Martin and audience participants around the country via telephone communications will also be featured.

Interested parties may register for the videoconference in Atlanta, Boston, Chicago, Cleveland, Dallas, Detroit, Houston, Los Angeles, Morristown, N.J., New York, Minneapolis, Philadelphia, San Francisco and Washington, D.C. The fee for attending this closed-circuit session is $195. Further details are available from Deltak at 1751 W. Diehl Road, Naperville, Ill. 60566.

Courses Offered On IMS, VM

NAPERVILLE, Ill. — Deltak, Inc. has announced two new series of courses for IBM users.

"IMS/VS Master Terminal Operations" (No. 32-7XX) is designed to prepare lead operators with two to three years of experience for master terminal operations in an MVS environment using IBM's Advanced Communications Function (ACF)/Vtam. Material in the four-course series covers conceptual ideas of the IMS/data communications environment and related hardware. Students learn how to start, control, monitor and halt the network including restart, recovery and security procedures, a spokeswoman said.

"The VM/SP CMS Series" focuses on IBM's Xedit full screen editor. The seven courses in the series include creating files with Xedit, maintaining files with Xedit, searching and multiple file techniques, display and file formats, compiling and executing programs and using VM utilities.

Purchase prices for each course in both series is $1,750 from Deltak at 1751 W. Diehl Road, Naperville, Ill. 60566.

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School's On-Line System Halts Abuse

Meal Tickets Keep Second Helpings in Line

ST. LOUIS — There is no such thing as a free lunch at St. Louis University, thanks to a computerized admission control system in the school's dining halls.

"We have five widely dispersed dining halls on campus, but they're not so widely dispersed that a student on a meal plan couldn't eat in one, go to another and eat the same meal again," explained John McGuigan, director of information systems for the university.

"College students will be college students," observed Gary Meyer, systems manager. "A couple of years ago, if one student was on a meal plan but his best buddy wasn't, he could eat a meal, then give his card to his friend, who would then eat in another dining hall."

Such violations led to a search for better admission controls, not only for the dining halls but also for a new $5.9 million recreation facility slated to open in November 1981. University officials wanted to find a way to guarantee that the urban facility was used only by those for whom it was built.

To help solve these problems, McGuigan first considered contracting with a commercial computerized admission service used on many university campuses nationwide.

Careful study, however, showed that it would be more cost-effective to develop an on-line verification system on the school's Honeywell, Inc. computer system, using the vendor's data collection terminals.

"We found that approach would also give us greater control over the program and allow us to tailor the application to our specific needs," McGuigan said.

Enthusiastic Response

McGuigan took his case to the management of the recreation facility, the campus housing authority and the Food Service Co., which has a concession to supply meals at the dining halls. The response was enthusiastic,and in September 1981, the plan was implemented.

Today when a student registers at the university, he receives an identification card resembling a credit card. The back of the card has a magnetic strip imprinted with his social security number.

If he is one of the 2,000 or so students on a meal plan, he opts for one of three weekly plans during registration. This choice is entered in his master file, which is resident on the university's large-scale Honeywell DPS 8/44 computer.

The ID card becomes the student's meal ticket and entry pass to the recreation facility. When the card is run through data collection terminals in these areas, terminal operators can see instantaneously on the CRT whether the student is entitled to enter.

As the card passes through the dining hall terminal, the system marks that meal as eaten. This guarantees that the card will not be used more than once for the same meal, even in a different dining facility.

The six desktop terminals are directly connected to the university's DPS 6/48 minicomputer, which holds data on each student's meal plan and the number of meals already eaten that week. The DPS 6 draws this information from the student's master file on the DPS 8 and updates the master file at the end of each weekly meal period.

What if a student forgets his ID card? The terminals allow keyboard data entry so that a terminal operator can key the Social Security number to determine whether he is entitled to enter.

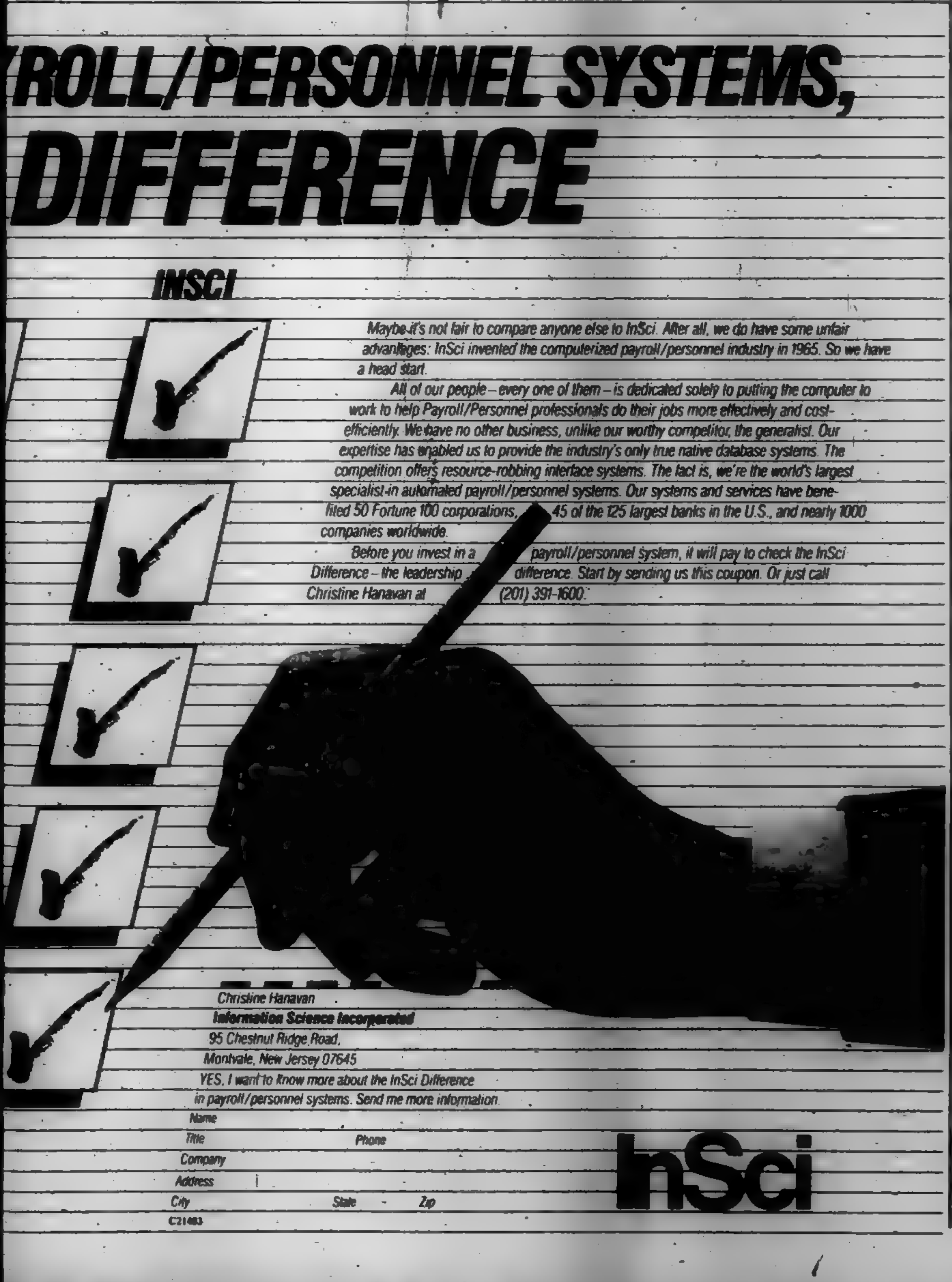
The system provides other controls as well. If a card is used twice within a designated period of time at the recreational facility, the terminal screen instructs the operator to match the photograph on the card with the person using it. This is designed to prevent a user from entering with a card, then dropping it from a window to someone not eligible to use the facility.

Each ID card is imprinted with an extra digit following the last digit of the Social Security number. The number is "0" on a student's first card, "1" on his second card, "2" on the next, and so on. This system lets the university invalidate lost cards, as well as charge students the appropriate fee for replacement cards.

The system has also resulted in tracking services for the Food Services Co., scheduling benefits for the recreation facility and accounting benefits for the university.

The DPS 8/44 has 2M bytes of main memory, a Datanet 6661 front-end network processor with 32 communications lines, two MSU 501 disk drives with 2G bytes of storage capacity, two MTU 500 tape units and a PRU 1201 1,200 line/min printer, all from Honeywell.

The DPS 6/48 system has 750K bytes of main memory and currently supports seven data entry terminals, five office automation workstations, three letter-quality printers for those stations and the six data collection terminals.



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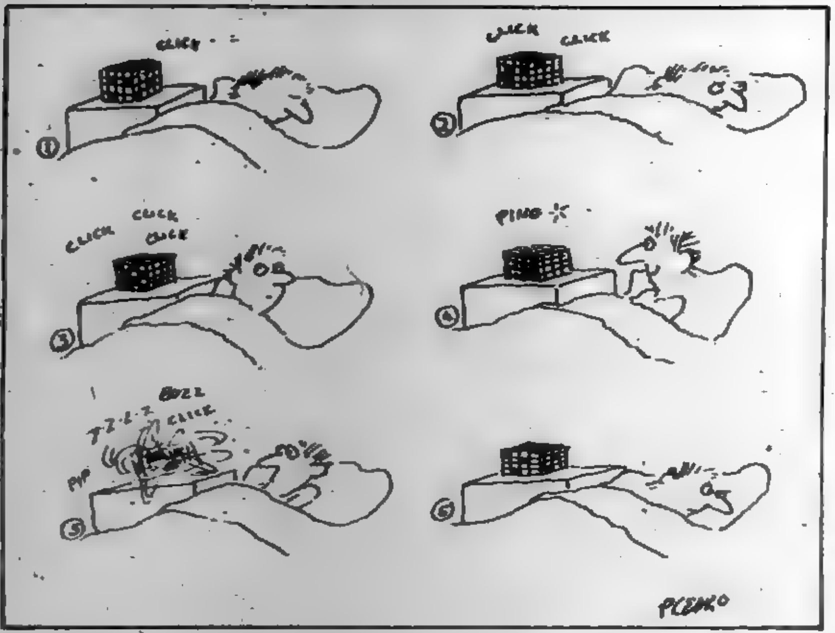

Calendar

Week of Feb. 27

Feb. 28-Mar. 1, San Francisco — **Local Networks: Promise Into Practice.** Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55424.

Feb. 28-March 2, San Diego — **Local-Area Networks: Design and Management.** Contact: Center for Advanced Professional Education, 11928 N. Earlham, Orange, Calif. 92669.

Feb. 28-March 4, Palo Alto, Calif. — **C Programming: A Hands-On Workshop.** Contact: Institute for Advanced Professional Studies, 55 Wheeler St., Cambridge, Mass. 02138.

Feb. 28-March 4, New York — **CICS Internal Architecture.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10015.

March 1-4, Los Angeles — **The 1983 National Data Base Management Symposium.** Contact: Software Institute of America, P.O. Box 97, Lynnfield, Mass. 01940.

March 2-4, Los Angeles — **SNA and Teleprocessing Access Methods.** Contact: Center for Advanced Professional Education, 11918 N. Earlham, Orange, Calif., 92669.

March 2-4, Denver, Colo. — **SAS Basics Course.** Contact: SAS Institute, SAS Circle, P.O. Box 8000, Cary, N.C. 27511.

March 3-4 Piscataway, N.J. — **IMS/Data Communications Applications Programming.** Contact: Rosa Roseto, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036.

March 4, Monroeville, Pa. — **Office Automation.** Contact: Chris Locklin, Computer Specialists, Inc., Suite 800, Jonnet Building, 4099 William Penn Highway, Monroeville, Pa. 15146.

March 4-5, Providence, R.I. — **Conference on Computer Technology: The Challenge to Business and Industry.** Contact: Association Internationale des Etudiants en Sciences Economiques et Commerciales, Box 1930, Providence, R.I. 02912.

Week of March 6

March 7, Columbus, Ohio — **Vsam Foundations.** Contact: Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

March 7-8, Washington, D.C. — **Satellite Telecommunications Technology.** Contact: Phillips Publishing, Inc., Suite 1200N, 7315 Wisconsin Ave., Bethesda, Md. 20814.

March 7-8, Washington, D.C. — **Satellite Communications Technology for Managers and Executives.** Contact: Phillips Publishing, Inc., Suite 1200N, 7315 Wisconsin Ave., Bethesda, Md. 20814.

March 7-9, Washington, D.C. — **Decision Support Systems.** Contact: U.S. Professional Development Institute, Department ABCDEF, 12611 Davan Drive, Silver Spring, Md. 20924.

March 7-9, Las Vegas — **Disaster Recovery Preparedness.** Contact: Devlin Associates, Inc., Suite 795, 1150 First Ave., King of Prussia, Pa. 19406.

March 7-9, New York — **Introduction to On-line System Design.** Contact: Rosa Roseto, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036.

March 7-9, Farmington, Conn. — **Vsam Programming Workshop.** Contact: New England Data Services, P.O. Box 92, Guilford, Conn. 06437.

March 7-9, Washington, D.C. — **Audit Methodology for Data Base Systems.** Contact: MIS Training Institute, 4 Brewster Road, Framingham, Mass. 01701.

March 7-9, San Francisco — **Data Dictionaries: Concepts, Contents and Uses.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

March 7-9, Columbia, Md. — **MVS/SP3 Differences.** Contact: Amdahl Education Center, 1250 E. Arques Ave., M/S 302, Sunnyvale, Calif. 94086.

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Calendar

March 7-9, San Francisco — **DP Project Management: A Practical Approach.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 7-9, New York — **The Personal Computer: Strategies for Managing.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 7-10, Chicago — **Systematic Software Design.** Contact: Eduteach, Inc., Suite 907, 162 N. State St., Chicago, Ill. 60601.

March 7-10, New York — **Computer Auditing.** Contact: Jeanne M. Nash, Information System Resources, Inc., 1444 Balsam St., St. Paul, Minn. 55122.

March 7-10, Dallas — **CICS/VS Applications System Design.** Contact: Rosa Roseto, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036.

March 7-11, Piscataway, N.J. — **CICS/VS Command-Level Applications Programming.** Contact: Rosa Roseto, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036.

March 7-11, Clearwater, Fla. — **Long-Range Data Processing Plan.** Contact: Keston Associates, 11317 Old Club Road, Rockville, Md. 20852.

March 7-11, Santa Clara, Calif. — **Job Control Language/OS Utilities.** Contact: Amdahl Education Center, 1250 E. Arques Ave., M/S 302, Sunnyvale, Calif. 94086.

March 7-11, Columbia, Md. — **VM Installation Workshop.** Contact: Amdahl Education Center, 1250 E. Arques Ave., M/S 302, Sunnyvale, Calif. 94086.

March 7-11, Atlanta — **MRP II: Manufacturing Resource Planning.** Contact: Oliver Wright Video Productions, Inc., 85 Allen Martin Drive, Essex Junction, Vt. 05452.

March 7-11, San Francisco — **Manufacturing Resource Planning.** Contact: Oliver Wright Education Associates, Inc., P.O. Box 313, Newbury, N.H. 03255.

March 7-11, New York — **Advanced OS/MVS Debugging.** Contact: Software Education Corp., 1114 Ave. of the Americas, 37th Floor, New York, N.Y. 10036.

March 8-9, New York — **CICS/VS System Problem Debugging.** Contact: Telecommunications Technology Corp., 548 Fifth Ave., New York, N.Y. 10036.

March 8-9, Columbus, Ohio — **Vsam Performance and Tuning.** Contact: Educational Coordinator, Goal Systems International, 5455 N. High St., Columbus, Ohio 43214.

March 8-9, Baltimore — **Trends and Economic Factors Influencing the Computer Business Outlook for 1983.** Contact: Mary Gockowski, Newton-Evans Research Co., 13382 Grinstead Court, Sykesville, Md. 21784.

March 8-9, Austin, Texas — **ACM Sigcomm '83 Symposium on Communications Architectures and Protocols.** Contact: Rebecca Hutchings, Honeywell/FSD, 7900 Westpark Drive, McLean, Va. 22102.

March 8-10, London — **Local Networks.** Contact: Meetings Systems, Inc., Suite 809, 286 Fifth Ave., New York, N.Y. 10001.

March 8-10, Boston — **Data Network Design: Techniques for Systems Analysis and Design.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

March 8-10, New York — **Computer Operations Management and Data Control.** Contact: Franks/Monahan Systems, Inc., 132 Baxter Lane, Milford, Conn. 06460

March 8-10, London — **Local Networks.** Contact: Meeting Systems Inc., Suite 809, 286 Fifth Ave., New York, N.Y. 10001.

March 8-11, Teaneck, N.J. — **Leadership: Managing and Influencing People.** Contact: Priscilla Goudreault, Education Coordinator, Q.E.D. Information Sciences, Inc., 180 Linden St., P.O. Box 181, Wellesley, Mass. 021181.

March 8-11, Cary, N.C. — **Introduction to Data Processing Using SAS Course (OS).** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

March 9-11, Baltimore — **Local-Area Networks.** Contact: Center for Advanced Professional Education, 11928 N. Earlham, Orange, Calif. 92669.

March 9-11, New York — **Data Communications for Microcomputers.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

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EDITORIAL

Buying Certification

While any attempt to bolster professionalism is commendable, some efforts are more laudable than others. Consider, for example, the Data Entry Management Association (Dema) and the Bank Administration Institute (BAI), which recently announced markedly different certification programs.

BAI, which has launched a certification program for bank DP auditors (see story on Page 17), promises nothing but a "practical educational experience," so much so that perhaps "certification" is a misnomer. It readily admits that a bank DP auditor, with 10 years' experience probably has little to gain by taking its program.

Instead, the program, made up of three five-day courses, is geared toward entry-level bank DP auditors. BAI encourages them not to take the courses one after another, but to give themselves a chance to apply between sessions what they have learned. As a result, even though the courses total three weeks of instruction, it will take from one to three years to complete the program. Some care obviously has been taken here to ensure that candidates incorporate their educational and professional experiences.

BAI "is not out to deceive people," according to a spokeswoman, and does not promise professional recognition or salary differential, merely continued education. The program is not cheap — courses cost $750 each — but for the entry-level DP auditor, it may be well worth it.

Dema recently began promoting a professional exam [CW, Feb. 7]. Others that promote this type of exam are the Institute for the Certification of Computer Professionals, which offers the Certificate in Data Processing (CDP) and Certificate in Computer Programming, and the EDP Auditors Association, which offers the Certificate in Information Systems Auditing (Cisa).

Managers wishing to sit for the Certificate in Data Entry (CDE) must take a brief, 1½-day workshop sponsored by Dema before taking the 90-minute exam. A three-day conference of which the workshop is but one part costs $470. Attendance at only the workshop costs $285; the exam costs another $35.

Unlike some certifying exams, there are no prerequisites to taking the CDE. In fact, Dema President Norman Bodek noted that anyone who takes the course "should be able to pass the exam," which follows the workshop.

Other professional DP certificate programs seem to require a little more of their candidates. CDP hopefuls may sit for the five-part exam at any time, but must have five years of experience in their field before the certificate will be awarded.

However, most DP certification programs require neither periodic recertification nor any other measure of keeping technologically current. The one exception is the EDP Auditor Association's Cisa.

Industry educational associations that recognize the necessity for updating their certification exams every two years should certainly be able to go one step further and see the wisdom in requiring certificate holders also to keep pace with new developments. After all, this is the difference between a professional exam and an educational program. Anyone can take a course and then either remain at that level or venture onto more difficult work.

Professionals do not have a choice. It is imperative, particularly in technology-related fields, they keep current with rapidly changing technology in order to serve their users to the best of their ability. This is what keeps professionals professional. And this is not possible without a minimally recognized level of knowledge in the field.

Educational programs and certificates can be purchased. Professionalism must be earned.

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LETTERS

Death Knell for Developers

The lead paragraph of the article "Injunction Issued in First Test of Copyright Law" [CW, Jan. 17] seems false.

The permanent injunction issued by a district court judge against a processing house that was charged with copying a program it administered and using it to compete directly with the program's owner should not, as the article maintains, "please" software developers and owners. Rather, it should have them quaking in their shoes; they can now be sued for their products, unless they have no competitors. The only ones who should be pleased with the decision are the original developers, who, as a result of the decision, can now go to court and obtain a court-sanctioned monopoly.

My company is a direct competitor of all parties to the case to which the article referred, and I was employed by the defendants to analyze the systems in question and testify in court about my analysis.

In this particular case, all the input is supplied by the user (the counties), as is the output and the computations to be used in ascertaining the tax. As data processing systems go, this was a relatively simple system with absolutely no complexities involved.

In this case, the petitioners successfully exploited the fact that the defendants acquired knowledge of the counties' needs as a result of being employed by the petitioners.

The petitioners then convinced the district court judge that because of having that knowledge, the only way the defendants could have developed a competing system was by copying theirs.

Although I have nothing to gain or lose as a result of the outcome of this case, I am scared to death of the precedent it would set.

If this decision is permitted to stand, the only software one can feel safe developing and marketing is in areas of which one has no prior knowledge. Should one develop and market software in an area one has knowledge of, then one is liable to be sued by the company from whom such knowledge was learned.

How many developers of software could successfully market their products if they were required to develop software in only those areas about which they had no previous knowledge?

In any other business, the value of a person's services is measured by his prior knowledge. If this decision is not overturned, the "value" of developers of software will be their lack of knowledge in an area. This is surely a death knell for developers of software.

In what other industry is an employee barred from terminating his relationship with his employer in order to go into business for himself and compete against his former employer if he feels that he cannot only improve the product/service of his former employer, but do so at a significantly lower price to the consumer/user?

In what other industry is competition prohibited and the free enterprise system short-circuited?

Sharlie Pender
President
Select Programming, Inc.
Kansas City, Mo.

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. Letters may be edited for purposes of brevity and clarity. Letters should be addressed to Editor, *Computerworld*, 375 Cochituate Road, P.O. Box 880, Framingham, Mass. 01701.

SOFTLINE /Werner L. Frank‡

What's Going On Down Under? — A Forecast

Datec Computer Services Pty. Ltd. is Australia's largest privately owned software company. Founded in 1966 by Harry Douglas, its managing director to this day, the company has 200 employees engaged in providing professional services, marketing software products and operating a modest data center.

Datec's growing reputation as an innovative company can be largely attributed to the imagination of Douglas. Under his leadership, Datec embarked on an impressive annual undertaking in 1974 to collect nationwide information concerning the management of data processing within organizations with revenues over $5 million and a minimum of 200 employees.

Using a succinct well-organized four-page questionnaire, DP centers are solicited for statistics based on the current year's operations and are invited to take a look forward into the next two years. Thus, 1981 and 1983 information comes from the 1981 survey, and the 1982 questionnaire contains results for 1982 and 1984. Over any two-year period, this interesting interweaving of data provides a four-year picture taken in two snapshots. With this continuity of measurement, it is possible to see both long-term trends, by looking forward, and short-range changes, by looking backward.

Datec performs the forecasting task as a service to the user community, as well as for its own promotional interests. As Douglas stated in the five-city forecast launch for 1982, "We don't expect to surprise the intended audience with startling new facts. Rather, we are confirming trends." Datec surveys 3,000 installations and typically receives qualified responses from 600 centers.

Five Areas Covered

The survey covers five areas of interest: use of hardware, software trends, budgets, personnel and new developments.

First, with respect to hardware usage, it was seen that the already established trend away from batch processing has continued, displaying a drop from 60% of total processing in 1981 to 34% in 1984. There has been a shift away from batch and a move toward on-line inquiry and on-line processing; these move from 13% to 34% and 27% to 42%, respectively. The changes here are consistent with U.S. movements, except for a time delay of about two to three years.

Another statistic, usually not found in the U.S., is the tendency toward free-standing, decentralized computing. This stood at 10%, with no change in sight, whereas the purchase of outside data services continues to show a decrease from 10% to 5% over the next two years.

This is not a happy signal to the computing services industry vendors. The remaining 80% of today's processing is split between pure centralized and distributed processing, with the former at 75% and the latter at 5%. These modes of computing will further shift in favor of distributed processing in the next few years, with a forecast split of 67% and 17%, respectively. Thus, distributed processing seems to be growing significantly.

DP Budget Components (%)

	U.S.*		Australia	
Staff	45%		37%	
Hardware	31		29	
Communications	8		4	
Supplies	4		7	
Outside Services	7		16	
Miscellaneous	5	(overhead)	7	(other)
Total	100%		100%	

*From International Data Corp.

Figure 1

Growth in categories of computers is similar to the pattern now exhibited in the U.S. Mainframes will increase at a modest 5%, whereas minicomputer and microcomputer shipments are expected to increase by 15% and 65% per annum.

Comparing DP Budgets

A significant quantitative difference between computing in the two countries is found when comparing the figures for a DP budget in terms of a percent of an organization's sales. In Australia, about 50% more (in the range of 1.2% to 2.7%) is expended than in the U.S. Since personnel costs are probably not more than 15% under American rates and imported hardware bears a premium, these cost differentials tend to balance each other out.

Perhaps the difference in expenditure rate can be accounted for by the greater efficiency of operation by the larger U.S. companies resulting from their economies of scale. This undoubtedly affects the comparison of our statistics with those of much smaller organizational DP centers found in Australia. The typical Australian DP budget is expected to increase by 20% from 1982 to 1983, reflecting real growth of about 8%.

Especially interesting is the total DP budget by component (see Figure 1). Expenditures for staff costs and those for outside services are significantly different in the two countries, although their respective sums are about equal. The 7% for outside services in the U.S. is made up of two components: 4% software and 3% services. The 16% for Australia includes three pieces: systems software at 6%, application packages at 5% and external staff at 5%.

We cannot easily account for this difference. We know, for example, that in the U.S., end users spend at least 150% to 200% more for outside computing services than is included in the DP budget. It is not clear from the Australian survey how much, if any, of this type of buying is included or ignored by respondents to the Datec survey. Now that this factor has been identified, Datec will survey it specifically in the 1983 cycle.

(Continued on Page 60)

HUMAN CONNECTION /Jack Stone‡

Unrealistic Expectations Haunt DP Collegians

This is the fifth article in a six-part series, "Computers and the Collegians," coauthored with Joanne Barker.

The vast disparity between what many new users of data processing systems expect in terms of computer services and what they actually receive is well known. In recent discussions with college students, several other areas of DP in which expectations are often unfulfilled were uncovered.

Bob Stewart, a philosophy major at a private college, talked about students who want to have computer savvy in a hurry.

"A surprisingly large number of muddleheaded students choose computer-related courses, blindly thinking that a few Basic programs under their belts will qualify them for high-paying computer jobs after graduation," he said. "I think they are influenced by success stories of recent graduates who use computers daily in their work. Basic courses are open to anyone, so everyone is taking them."

Unrealistic Expectations

"But many students, particularly the younger ones, are unrealistic about how well they will do in the course," Stewart said. "These individuals expect to expand their minds instantly merely by plugging in a machine.

"You know, there are no courses quite like those dealing with computers. Computer education requires a entirely new approach to study because it involves unfamiliar terminology, unique logical expressions and powerful equipment. The students have no idea of the work that is required to complete homework assignments and lab exercises on time. So what happens? They wind up failing their courses or dropping them, and these students suffer as a result.

"Do you want to know how bad it can get? Ten people out of 35 dropped the Introduction to Computers class that I was in!"

Family Expectations

Tony Charles, a business major at a large state university, described the situation of many students who take computer courses because of unrealistic expectations on the part of their families.

"Bob talked about students who made their own decisions about a computer-oriented curriculum and found the going very rough. But there's another group that has even more of a problem, namely, the group of students who are goaded, or even coerced, into the DP field by well-intentioned parents with high, but often unjustified, hopes for prosperous careers for their college kids.

"These people don't understand that they're being victimized by a modern-day myth surrounding computers and perpetuated by all the publicity about the machines. This is the notion that 'everything' will be computerized and that unless students are 'into' computers, job prospects will be bleak and they will walk off the graduation platform with their diplomas in hand and head straight for the local bread line.

"As if parental forces aren't enough, students are also on the receiving end of intense pushing and shoving from other family members. I suppose that college students have always been subjected to such pressures, but today's parents are a lot wiser. They no longer have to foot the bill for seven years to make their children physicians or lawyers; they've learned that four years worth of college in a computer-related science is enough to get the kid a decent job."

The Message Is Heard

"The message is being heard. Many students start their computer education by signing up for seemingly elementary courses," Charles said. "Then they have to send the tragic word home about dropping the computer courses, claiming that the work load was just too much to handle.

"I would think that much of this anguish could be avoided if all concerned took a cold hard look at a student's scholastic record and study habits and made some realistic assessments about his success before tossing him into the computer arena.

"But asking families to exercise reason on this subject may be akin to barking at the moon, particularly when millions of parents see a computer on the cover of *Time* magazine's 'Man of the Year' issue for 1982."

DP Forecast: What's Going On Down Under?

(Continued from Page 59)

With respect to software, a number of questions were posed about the penetration and use of application packages. The Datec survey revealed that 69% of the reporting organizations now use commercially available application packages, with a 46% increase in the number of application packages in use from 1981 to 1982.

Overrunning Budgets

Of some significance, was the revelation that most of these organizations spend considerably more of their budgets in introducing such software than was planned. In fact, 71% of the respondents overran their budgets, 26% were right on and 3% underspent. The overruns ranged from 20% for 38% of the respondents to more than 60% for 13% of the replies.

Another aspect of the software situation was investigated by questions concerning backlogs in developing applications. It was found that there is an average wait of seven months for new projects to be undertaken and that the average number of new applications to be started in the next two years was just under six, a decrease of 17% from earlier forecasts.

These statistics translate into a 16% two-year manpower shortfall, which is a substantial reduction from the previous year's forecast of a 27% deficiency. But these reductions are undoubtedly due to the negative economic situation prevailing in Australia, where the inflation rate is still rising from its current 12% rate.

Personnel Training

One area of interest often overlooked by U.S. surveys is personnel training. Here we receive some insights that may help American DP management. Of all reporting companies, 44% have formal programming training courses for new personnel. In addition, classroom training and self-study courses are available for all DP personnel, split almost evenly for a total of 14 man-days per annum for each such employee.

In the new development area, two questions were presented. First, the impact of the so-called fourth-generation languages was studied. Among the respondents, 23% indicated that they were currently using such technology, 36% were investigating such use and 40% were currently not considering it.

Of additional interest, the actual use to which these language systems were put included 57% for query and 47% for application development. An overwhelming 87% of the users of fourth-generation languages are satisfied with such use.

Computer Graphics

In the area of computer graphics, the survey indicated that 20% of respondents are currently using graphics, 33% are investigating such use and 47% are not currently considering it. Those reporting such use apply graphics as follows: 38% to business, 34% to engineering and 28% to miscellaneous areas.

In addition to the survey results, three interesting points were made during the forecast discussions. The first was described as Douglas' "new theory of infrastructure vs. device technology."

This theory was developed during a friendly argument about the status of computing in Australia as compared with the U.S. One protagonist asserted that Australia was on a par with the U.S., but Douglas observed that while devices and components are readily available in Australia at about the same time they come to market in New York or Los Angeles, actual usage of integrated systems in Australia lags years behind use in America.

In other words, the structure of the society into which the computer is introduced affects both the speed and degree of its utilization by that society. This phenomenon appears not only in computing in Australia, but also in other high-technology sectors such as telephone, satellite communications and cable TV.

Special Tip

A second point of interest brought out during the forecast discussions was the special tip Datec gave to the attending managers on making a decision to buy software packages.

Buyers were advised to generate carefully their own lists of software requirements for a given system or application area and then to compare these lists with off-the-shelf products that purportedly satisfy the need. Counting the "yes," "no" and "maybe" responses for each line item by product, the buyer was urged to reject any offering for which the "yes" responses were fewer than 80%.

Finally, Datec observed that there is a continuing problem in personnel training and manpower shortfall. To help solve this problem, Datec announced the formation of the first commercially sponsored "summer" computer camp for teenagers to begin in January 1983.

Frank is an independent consultant and president of the W. L. Frank Computer Group located in Calabasas, Calif.

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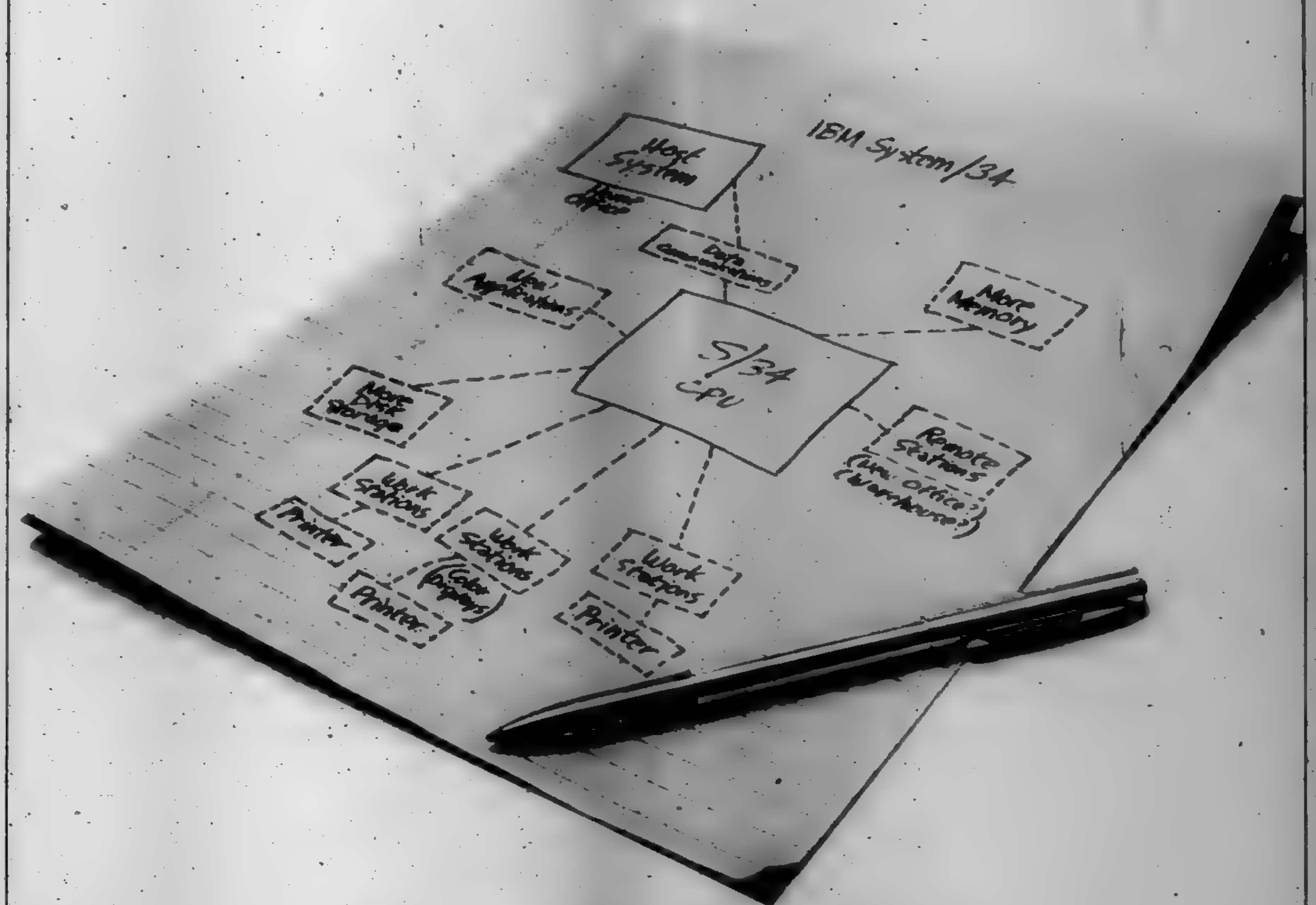

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GETTING AHEAD IN DP /Donald J. Berardo‡

The Hidden Benefits, Risks of Promotions

A promotion is a promotion is a promotion, right? Wrong. Some promotions are more desirable than others, some carry hidden risks and some mean one thing to you and something else to your fellow workers or your boss.

The topic of promotions is politically loaded, and just as you can't tell who the players are without a scorecard, you can't tell what promotions mean without a guide. Without a guide to the differences between them, they may all look alike to you and you could miss part of the action.

Let's start with the most familiar type, the "pure promotion." This translates into more money and usually means more responsibility and a new title. The company rewards you financially and acknowledges you as a valuable employee. And what's more, everybody knows it, which is always gratifying. Your name and picture may appear in the company newspaper and you may get a larger desk or office. The point is that this promotion is public and highly visible, bringing you prestige, as well as more money.

These advancements are usually part of a structured pattern called a career path. This means that you are progressing step by step up the ladder within your DP specialty, for instance, moving from trainee to junior programmer or from senior programmer to project leader. This sort of promotion usually comes on your anniversary, after an annual review.

To measure the strength or weakness indicated by your promotion, determine whether your progress is faster or slower than the norm. Has it taken you three years to achieve what took others only 1½ years? Or has your progress been faster than the progress of your peers?

Some Disadvantages

Some disadvantages of a pure promotion are that your increased responsibilities and authority may be more than you bargained for, or your fellow workers may envy your success.

When office politics or awkward timing requires hush treatment of a promotion, the result is often a "silent promotion" or "blind promotion." Silent promotions are usually career path promotions, but without any public hoopla. In place of public prestige, this promotion offers — in addition to money and a new, though hidden, job level — some advantages:

- By moving up quietly, you don't encounter public hassles and resentment from your fellow workers.
- You realize how important you are to upper management, which gives you leverage. (Take care to note whether the circumstances that caused your silent promotion may have also created any resentment on the part of management if they feared losing you.)

'Power Promotion'

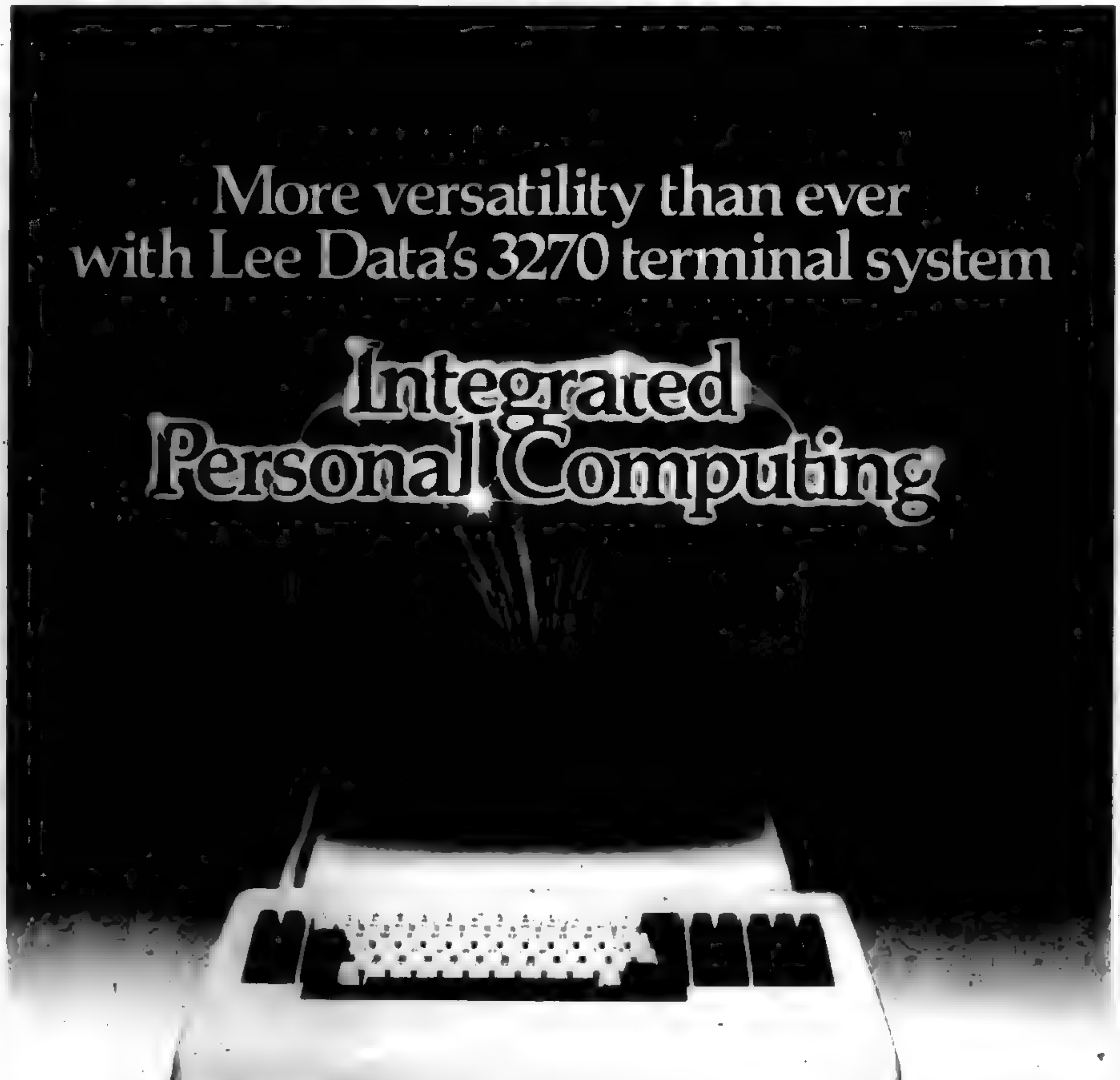
Using your leverage to rise through the corporate structure results in a "power promotion."

Such a promotion can be either public or silent and is achieved by telling management, either directly or indirectly, "Give me more money and power right now or goodbye." This tactic is not recommended and rarely succeeds.

But power promotions also include some disadvantages. Provoking management into giving you a promotion may make them resent you and regard you as a complainer or as a manipulator who isn't a team player. A power promotion may hurt you later on.

In contrast to the silent

(Continued on Page 65)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Examining Promotions

(Continued from Page 64)

promotion, which gives you more than what meets the public eye, there's the "cosmetic promotion," which gives you less than what meets the eye. This is the sort of promotion people are referring to when they say, "So-and-so got kicked upstairs" or "They're promoting so-and-so right out of the company."

The cosmetic promotion can result from a major reorganization. Though this sort of promotion usually includes a new title, new duties and may even include a raise, it's really a nonpromotion; it involves less power and less responsibility.

Really a Trade-Off

The "lateral promotion," like the pure promotion, can increase your prestige and authority, but not your salary. It's really a trade-off. You take the same pay in exchange for more complicated or interesting duties, or a better title, or a nicer department or more visibility. But this may mean that your position has diminished in the eyes of management.

Finally, there's the "self-investment promotion," which may look like a backward step, but is actually part of a long-range plan to move two steps ahead.

For example, taking a cut in pay to accept a job in data base management systems is a move you might make today "for the experience," expecting greater rewards tomorrow. It's a case of promoting yourself.

Ask Yourself

To help you find your way through the corporate maze, you should investigate these areas:

- What does your company's manual on personnel policies and practices say about promotions?
- How and where does your company post internal job openings?
- How much internal mobility is allowed in your company? One change every six months? Only one change in the first year?
- What are the elements of your company's appraisal system?
- Are merit promotions given, or does promotion depend strictly on an annual review?

Part of getting ahead is knowing how you're getting there.

Berardo is a management counselor and career therapist. He is a vice-president with the Meld Group in West Hartford, Conn., publishers of a monthly newsletter on management development.

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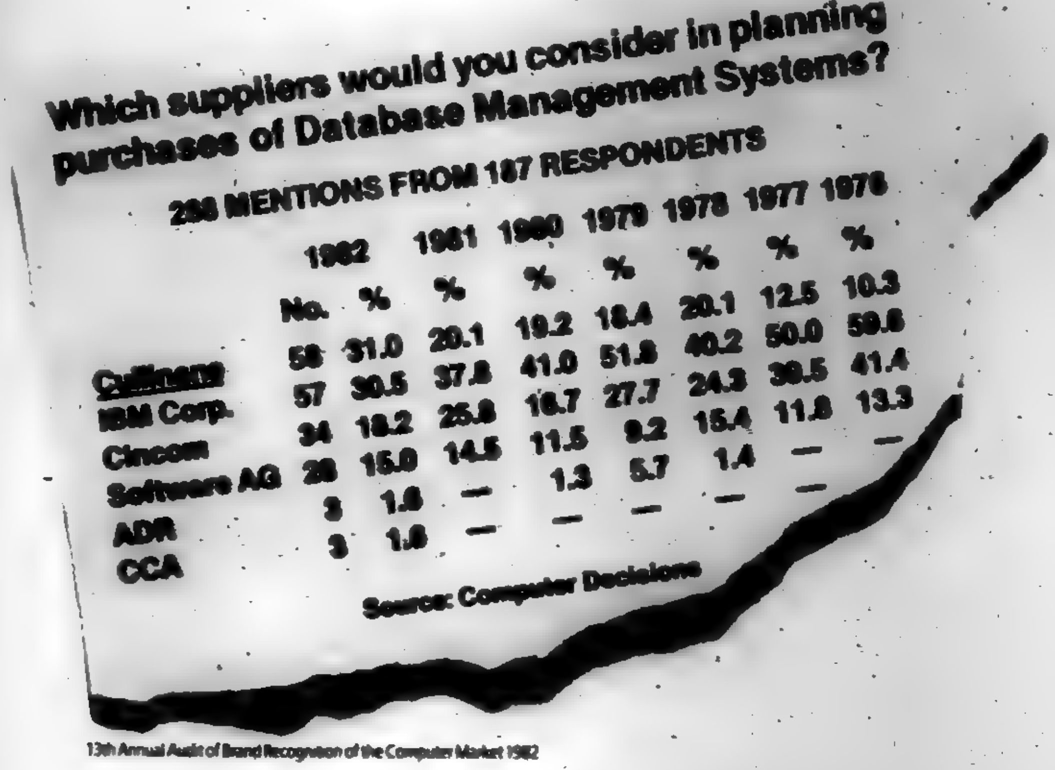

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298 MENTIONS FROM 187 RESPONDENTS

	1982 No.	1982 %	1981 %	1980 %	1979 %	1978 %	1977 %	1976 %
Cullinane	58	31.0	20.1	19.2	18.4	20.1	12.5	10.3
IBM Corp.	57	30.5	37.8	41.0	51.8	40.2	50.0	59.6
Cincom	34	18.2	25.8	16.7	27.7	24.3	30.5	41.4
Software AG	28	15.0	14.5	11.5	9.2	15.4	11.8	13.3
ADR	3	1.6	—	1.3	5.7	1.4	—	—
CCA	3	1.6	—	—	—	—	—	

Source: Computer Decisions

13th Annual Audit of Brand Recognition of the Computer Market 1982

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'Best Features' of Competitors

Second User Pleased With Stratagem DSS

By Paul Gillin
CW Staff

SAN FRANCISCO — It was an unusual choice for a bank to make: the upstart over the sturdy reliables, the anonymous new contender over the known standard-bearers.

Nevertheless, when Wells Fargo Bank's Management Reporting and Analysis Department started looking for a decision support system (DSS) in 1981, it passed by Management Decision Systems, Inc.'s Express and Chase Econometrics/Interactive Data Corp.'s Xsim to become the second user of Integrated Planning, Inc.'s Stratagem.

"We thought it was a pretty bold move," said Tom Byrom, vice-president of financial reporting and analysis.

"Stratagem didn't have a lot of the features of the other two competitors — like statistical power and report writing — but it did have the best features of both," affirmed Byrom.

The department turns out the annual profit planning process and divisional profitability reports for 10 divisions of Wells Fargo Bank. Reports include basic variance, actual vs. planned and analyses of profit plans. "We handle a lot of data and a lot of applications," Byrom said. "The work of this department is very dependent on the DSS." The department runs Stratagem on an in-house IBM 3031 utilizing a customized report writer and on a time-shared system through Tymshare, Inc.

Stratagem features that appealed to Wells Fargo included modeling across an unlimited number of dimensions and a programming language that is unique to the package. Another factor was price, according to management information systems consultant Clarence Yee, who participated in the decision. At $50,000 in 1981, Stratagem was about one-third as costly as its direct competitors.

Yee said the specialized modeling requirements of the department made Stratagem's unique command language attractive.

"There is a core language for basic data manipulation, I/O and data management subroutines," he said.

"It's fairly primitive but, when combined with some logical repeat moves, it

(Continued on Page 70)

Development Aid Targets IBM CPUs Under OS, DOS

OKLAHOMA CITY — Progressive Software, Inc. has introduced Pro-Screen, an IBM CICS applications development system for IBM and plug-compatible mainframes running under OS and DOS.

The package reportedly enables users to access any system file, including files not defined to CICS. This includes performing inquiry and update on sequential files.

Pro-Screen consists of a screen-building facility and a file-handling facility, the vendor explained. The screen-building facility was designed to allow users to for-

(Continued on Page 74)

Compression System Out for DOS/VSE

CHICAGO — A data compression system for IBM DOS/VSE systems with Vsam has been announced by Database Technology Corp.

Com-Pres/Vsam Disk Resource Maximizer provides from 30% to 70% data compression, the company claimed, thereby cutting Vsam disk space needs. The package also was designed to reduce file backup and recovery time and the need for tape handling. Installation requires no changes to application programs or job control language.

The purchase price is $4,950 from Suite 110, 664 N. Michigan Ave., Chicago, Ill., 60611.

Bell Labs Offers Unix System V For DEC Systems

MURRAY HILL, N.J. — Bell Laboratories has unveiled Unix System V, an operating system that will be supported by Western Electric.

Designed to work on Digital Equipment Corp. VAX-11/780, VAX-11/750 and PDP-11/70 systems, Unix System V reportedly incorporates more than 1,000 modifications to previous Unix systems. Among these features are a 1K-byte block file system, performance improvements on VAX series equipment and additional interprocess communications capabilities. The larger block size is said to improve the file system throughput.

(Continued on Page 74)

Version of 'Intercomm' Monitor Uses 370-Compatible Software

NEW YORK — SDA Products, Inc. has announced Release 9.0 of Intercomm, a teleprocessing monitor for computer systems using IBM's 370-compatible systems software.

Release 9.0 includes an extended security system, an automated system modification facility, IBM Vtam 3270 support and more extensive documentation. The vendor claimed Release 9.0 offers a redesign of more than one-third of the existing package and offers 30 new modules.

The teleprocessing package also reportedly offers additional features including improvements in performance, reliability, problem resolution and installation.

Under Release 9.0, Intercomm can support a virtually unlimited number of teleprocessing devices, transaction codes, applications subsystems and data base files. By itself, Intercomm can reportedly handle an on-line computer system averaging 100,000 transaction/hour from more than 3,000 terminals.

Release 9.0 of Intercomm costs $75,000 for a perpetual license fee. This license includes installation of the software and two weeks of on-site customer training. Further information is available from the firm at 71 Fifth Ave., New York, N.Y. 10003.

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Productivity Tools Out for HP 3000

LOS ANGELES — Imacs Systems Corp. has released five programmer productivity tools for the Hewlett-Packard Co. HP 3000, designed to be used in conjunction with HP's Imacs-developed Rapid/3000 productivity tools.

Analyst/3000 is an interactive tool that uses Yourdon, Inc.'s structured analysis methodology to aid in the analysis, design and documentation of information systems. Analyst/3000 costs $5,000.

Programmer/3000 automatically generates Rapid/3000's Transact/3000 source code based on the data and data structures defined in Rapid/3000's Dictionary/3000. Programmer/3000 costs $7,000.

Cobra/3000 utilizes information gathered from Dictionary/3000 to produce copy-lib-type code for the data division. Cobra/3000 costs $2,500.

Lynx/3000 is a multidictionary support utility said to allow for the selective unloading of data from one dictionary to be merged to another dictionary. Lynx/3000 costs $2,500.

Colt/3000 is said to scan an existing Cobol source code file, extract data item, data set, file, program definitions/relationships and generate corresponding entries in the Dictionary/3000 data base. It costs $2,500.

Imacs is located at 3700 Santa Fe Ave., Los Angeles, Calif. 90058.

Enhancement Of 'Csar' Offered

ATLANTA — Software Concepts, Inc. has announced Version 2 of its Computer Scheduling and Reporting System (Csar), said to feature on-line updating with on-line tutorials.

Reportedly compatible with all IBM hardware and software, Csar features software monitoring facilities that provide automatic operational control while allowing on-line users access to operational data.

The DOS version costs $17,500, with lease plans available from the firm at Suite 1450, 250 Piedmont Ave., N.E., Atlanta, Ga. 30308.

For Systems Running MVS

SPI Enhanced for 370, 3080

PITTSBURGH, Pa. — Duquesne Systems, Inc. has added enhancements to its Systems Performance Interrogator (SPI) for IBM 370 and 3080 series systems running MVS.

Cylinder mapping reports display the total activity for each data set display. New commands provide step, job, TSO and I/O time and byte counts, a spokeswoman said. Others display CPU, I/O and total time in percentages of elapsed time for jobs and TSO users. Common storage area and system queue area displays show, by subpool, how much space is free or occupied in each area.

New displays include page rate for address spaces and for the entire system and transaction counts by address space and performance groups. Active and elapsed transaction and total session time have also been added, the spokeswoman said.

SPI can be run in a batch job mode. The Automatic SPI Command Member allows start-up commands to be executed as soon as the session begins. A necessary component of SPI is the Quantitative Computer Measurement Performance Monitor, which includes event-driven I/O measurements, capacity planning, statistics data set placement and cylinder mapping capabilities.

The entire package costs $20,000, with SPI alone priced at $6,000 from Duquesne Systems at Two Allegheny Center, Pittsburgh, Pa. 15212.

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By using CYX to build the Fully Integrated Reservation System for Travel (FIRST), Tymshare, Inc. cut months out of their production schedule — time that would have been spent developing their own untested transaction processing system.

Union Carbide's new Material Acquisitions Data Processing System is relying on CYX to economically distribute transaction processing capabilities to chemical plants across the country.

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For more information about how CYX can work for you, call or write Nik Kirkeng.

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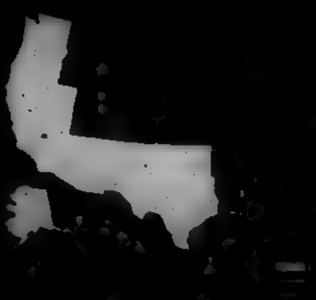
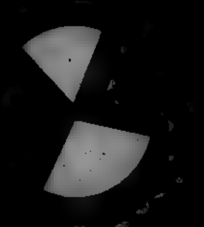


Choropleth Map of Product

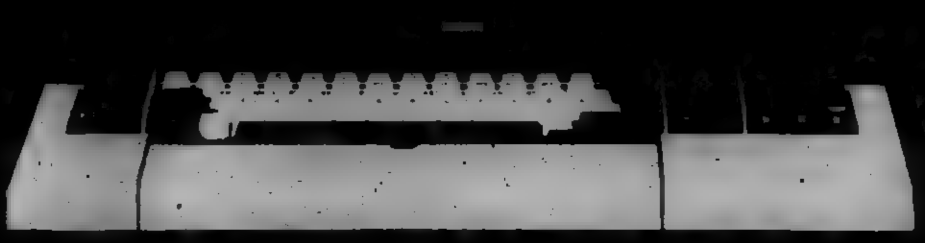


Pie Chart of Revenue

Plot of Funds/Year

Telephone Expenditures

[illegible] Times



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Security Packages Target Micros

MOUNT HOLLY, N.J. — Structured Software Systems, Inc. has announced two software security packages for use with Hewlett-Packard Co. desktop computers.

SEC36, for use with HP 9826/36 computers, protects Basic programs distributed on HP standard minifloppy disks by "fingerprinting" the minifloppy with special security codes. These are checked by an assembly language subroutine appended to each application program.

Dsec87, for use with HP-86 and HP-87 computers, is said to prevent listing, tracing, merging or any other revealing access to secured programs by any system routines. Encryption is accomplished using a two-part fingerprint.

SEC36 costs $4,000 and Dsec87 costs $1,500 from the firm through P.O. Box 1072, Irick Road, Mount Holly, N.J. 08060.

User's Manual on Modula-2 Announced by Volition Systems

DEL MAR, Calif. — Volition Systems, Inc. has issued a loose-leaf "Modula-2 User's Manual" describing Niklaus Wirth's programming language.

The 264-page document contains a tutorial for Pascal programmers and sections defining library modules.

The manual comes with a copy of Wirth's 48-page technical report on Modula-2. The manual costs $35 through P.O. Box 1236, Del Mar, Calif. 92014.

Data Base Utilities Discounted

BUFFALO, N.Y. — Bradmark Computer Systems, Inc. is offering its line of data base utilities for Hewlett-Packard Co. HP 3000 systems at a 30% discount to nonprofit educational institutions.

The complete package (before discount) costs $4,750, according to Bradmark.

List prices for the individual components of the package cost $2,500 for DBcopy II, $3,500 for DBisam and $1,500 each for the DB-key-change and Base Builder packages, said the firm.

Bradmark is located at 4446 Main St., Buffalo, N.Y. 14226.

Second User Likes Its DSS

(Continued from Page 67)

becomes easy to build a system in which reports change as the structure of the company changes," he said.

The department has used the core language, Yee said, "to enable the system to be controlled by a system of tables that can be manipulated by people who don't know very much about computers. In essence, the system automatically reprograms itself."

Unique Package

The core language is part of a more comprehensive programming language that is unique to the package, Yee said.

"Much of Stratagem is actually written in Stratagem," he said. "That makes for consistency from the beginning. A user can write his own functions in Stratagem, which gives the language tremendous power."

While several languages have such a capability, Yee said, "Stratagem's is better than any I've seen."

The effects on the department, Byrom said, "have been pretty significant."

While users can learn basic I/O routines in a few hours, Yee said, fluency on Stratagem takes several months to develop. "It's not user-friendly in the sense of [Visicorp's] Visicalc," he said, "but none of the users are what I would call bits and bytes types."

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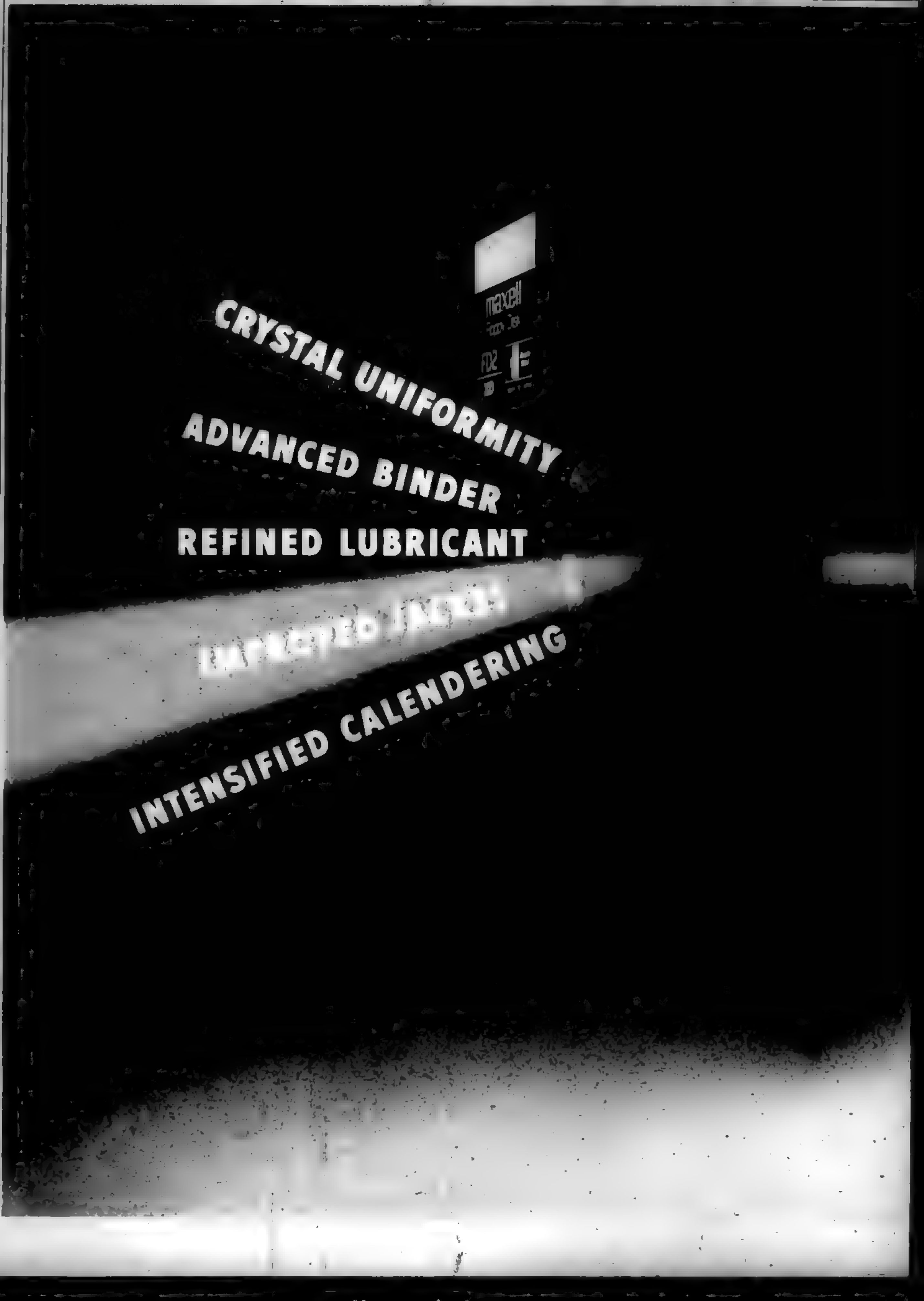


Utilization Reporting Tool Announced for System/38

SAN DIEGO — Integrated Systems Management, Inc. has announced a system utilization reporting tool for the IBM System/38.

The ISM Job Accounting System (Ijas/38) provides utilization information by user name, job name and assigned departments, a spokesman said. The system also provides necessary tools for costing out system usage to users.

Ijas/38 is priced at $3,500 until March 31, $5,000 after March 31, from Suite 344, 2515 Camino Del Rio S., San Diego, Calif. 92108.

In Case of Fire

Some Tips on Protecting Software

By Ed McGunn
Special to CW‡

Do you know how to properly store and protect software tapes in the event of a fire? Safety expert McGunn describes what he feels is an overlooked form of protection for DP resources.

Many businesses are savvy enough to store paper records in fireproof drawers, but do little to protect their software.

DP and micrographic media distorts at temperatures above 150°F — disks above 125°F — and at relative humidity over 85%. This is significant because, as the National Bureau of Standards reports, fires can reach approximately 800°F at the ceiling and 260°F at the floor in 1.45 minutes.

And according to the National Fire Prevention Association, nine out of 10 business fires result in loss of unprotected records, including those needed to settle insurance claims and resume normal operations.

When counseling businesses using DP and micrographic media, I specify a storage environment where:

- Temperatures will not exceed 125°F for disks and 150°F for other DP and micrographic media.
- Humidity never exceeds 85%.
- The material is protected from dust and exposure to sunlight and magnetic hazards.

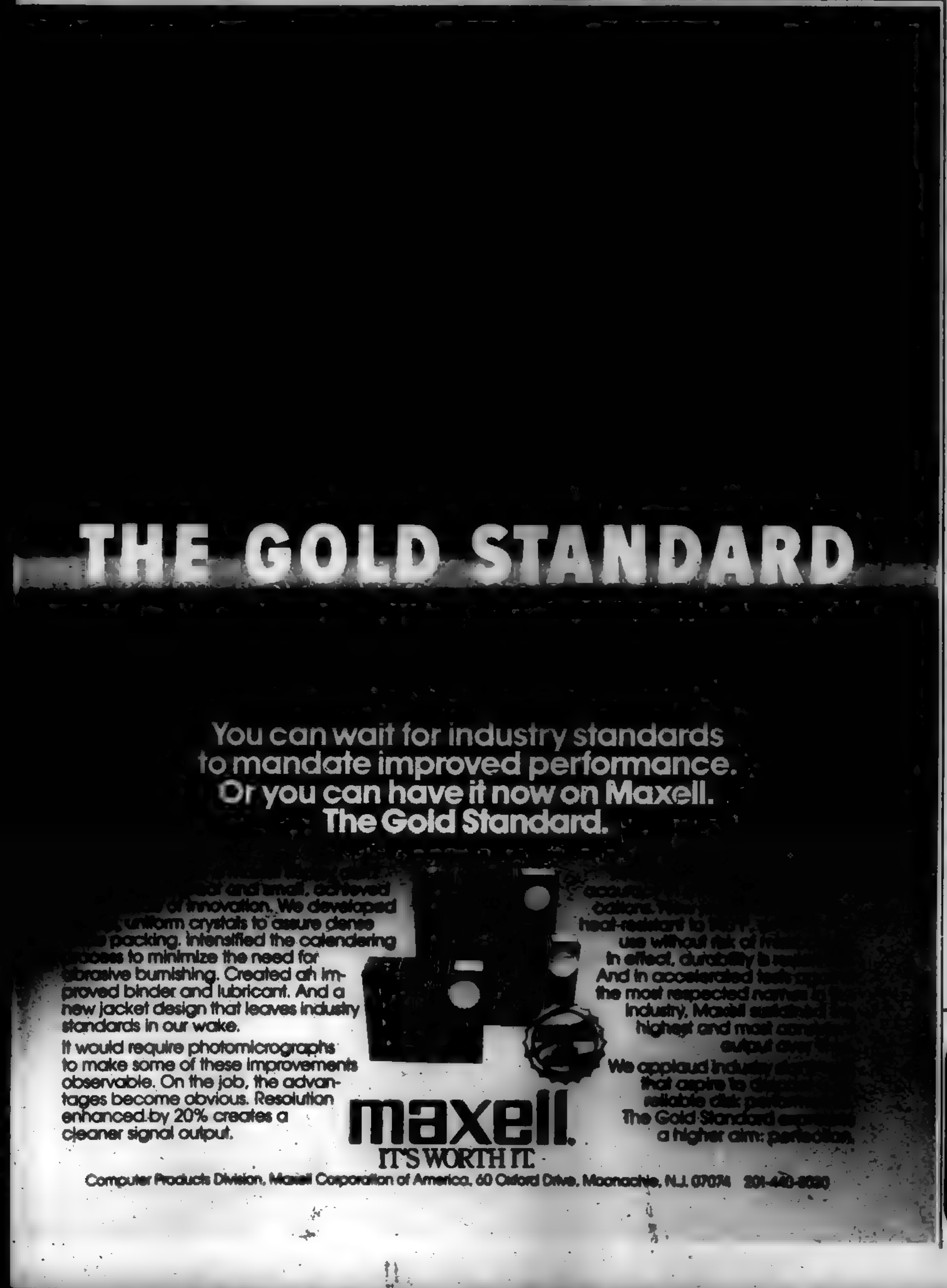
Most storage containers do not meet these standards. The best solution is a top quality safe created specifically for software storage and protection.

The key in selecting such a safe, which may run from $2,100 to $5,900, is to work with a manufacturer you trust and obtain documents or data that supports any product claims made. You need to know what kind of studies the manufacturer conducted and you need to see copies of test results.

Once a reliable source for the safe has been identified, the remaining decisions involve determining the size of the safe needed and the type and number of interior accessories or fittings required.

Most experienced suppliers will provide a special calculating sheet that takes into account the type of media and the quantity to be stored, and the amount each safe can handle.

McGunn, a safe manufacturer for more than 20 years, is now a distributor in Chicago for companies such as Israel Safe Distributors.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'Pacs' Management Tool Enhanced

GOLETA, Calif. — Signal Technology, Inc. has announced enhancements to its Process Accounting and Chargeback System (Pacs) management utility and its Ezlog login extension. Both products run on Digital Equipment Corp. VAX-11 computers under VMS.

Pacs provides management reports, system usage data and chargeback billing invoices, the vendor said. The enhanced version reads directly from the VAX/VMS 3.0 accounting file without use of the VMS conversion utility. It allows for accounting of third-party software and hardware by elapsed CPU time, frequency count or connect time. Terminal port accounting and three billing report options have been added.

Ezlog is said to provide project-based job accounting and an extra level of system security by prompting for a project name and second password. System managers can set up project accounting by account, project and user name levels of reporting or can have projects treated as accounts.

Pacs costs $4,900 and Ezlog costs $2,200 from Signal Technology at 5951 Encina Road, Goleta, Calif. 93117.

'TMS/3000' Out For HP 3000

AUSTIN, Texas — Tymlabs Corp. has announced the TMS/3000, a terminal usage monitoring package for Hewlett-Packard Co. HP 3000 processors.

The package collects port I/O data in real time and reports actual terminal usage by time of day. A systems manager can select which terminals are to be monitored through a configuration file. The TMS/3000 automatically initiates a report program for printing each day's terminal usage graphs. Daily files can be programmed to stay in the system or be purged automatically, the vendor said.

The TMS/3000 costs $600, the firm said from 211 E. 7th St., Austin, Texas 78701.

Prime Factors Cuts Prices On Encryption Subsystems

OAKLAND, Calif. — Prime Factors has cut prices on its software encryption subsystems that implement the Data Encryption Standard (DES).

Descrypt/FS was $950 and now costs $500. The Fortran implementation runs Electronic Code Book (ECB), Output Feedback and Cipher Lock Chaining modes of DES on any machine that supports a Fortran compiler.

Descrypt/CS was $950 and now licenses for $500. The Cobol implementation runs ECB mode of DES and is suited for encryption/decryption of automated teller machine personal identification numbers.

Descrypt, once $2,750, now costs $1,750. The high-speed IBM assembler implementation decrypts and encrypts in excess of 50K bytes/sec on an IBM 3033 or equivalent.

Prime Factors is at 6529 Telegraph Ave., Oakland, Calif. 94609.

HP 3000 Gets Resource Utility

CONSHOHOCKEN, Pa. — A project analysis and control system for planning and scheduling resources has been introduced by Meta Technologies, Inc.

Metapacs operates on the Hewlett-Packard Co. HP 3000 computer system in an interactive terminal environment. The software provides cost analysis, milestone reporting and project progress reporting.

Metapacs also provides a utility for user-defined reports. Prices range from $5,000 to $10,000 from the vendor at Suite 201, 15 E. Ridge Pike, Conshohocken, Pa. 19496.

P-Stat Version Fits DPS 8

PRINCETON, N.J. — P-Stat, Inc. has announced a version of its P-Stat data management system for Honeywell, Inc. DPS 8 computers with the CP-6 operating system.

P-Stat provides statistics, relational data management, data display and cross-tabulation abilities using a nonprocedural command language. Up to 500 on-line or batch users may perform a mix of activities concurrently. P-Stat runs in interactive or batch mode.

A license fee costs $8,000 for the first year and $3,000 for subsequent years through P.O. Box AH, Princeton, N.J. 08540.

For those who think Mohawk Data Sciences is another name for data entry...

Our name's been synonymous with key-to-storage data entry for 20 years. Ever since our first industry breakthrough.

But we haven't rested on laurels. We innovated the concept of distributed data processing with our *Series 21* product line. We made it reliable, flexible, expandable. In an industry where these features are often claimed but rarely found.

So take another look at MDS. Multi-divisional. Multi-national. A profitable company with multiple products for data processing. Word processing. Data communications. Electronic mail. Network management. And data entry.

For more information call one of our 300 sales and service offices worldwide, or our headquarters at 7 Century Drive, Parsippany, NJ 07054. (201) 540-9080.

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- **POWERFUL DIAGNOSTIC PANEL** Modem loop-back, unit self-tests, and terminal diagnostics

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CICS Development Aid Out

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More than 200 of the largest companies in the world are already using our VM products including 35 of the Fortune 50 (We won't tell whether number 38 is on the list). That's because we offer the best VM products available—anywhere. Call us, write us, but if you're looking at VM, you can't afford to ignore us.

**Call Us
703 821-6886
or Write**

**VM Software, Inc.
7777 Leesburg Pike,
Suite 220S
Falls Church, Virginia 22043**

Name
Title
Company
Address
City State ZIP
Phone ( )
CPU:

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Compiler Fits FPS-164

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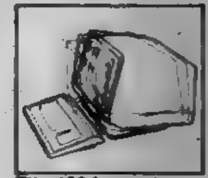

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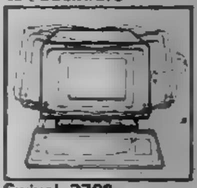

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or Write

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Falls Church, Virginia 22043

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CPU

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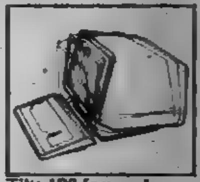

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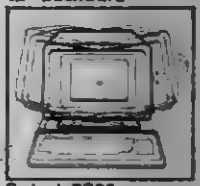

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WEST LAFAYETTE, Ind. — Pritsker & Associates, Inc. have introduced a time-sharing service said to provide access to its collection of simulation software products.

These products include Simulation Language for Alternative Modeling, Analysis and Identification of Distributions and Simchart.

Pritsker & Associates operates a Digital Equipment Corp. VAX-11/780 with dial-up service available at 300 to 1,200 bit/sec. The vendor's software, computing center and consulting staffs are available for telephone and on-site support. Service is billed on an as-used basis from the vendor through P.O. Box 2413, West Lafayette, Ind. 47906.

Docu/Text-200 Release Out for IBM

SAN JOSE, Calif. — Diversified Software Systems, Inc. has announced Release 3.0 of its Docu/Text-200 documentation package for IBM systems running the OS/VS operating system.

Major features of Release 3.0 are support for use of graphics capabilities of laser printer flowcharts and an on-line forms interface to Pansophic Systems, Inc.'s Panvalet and Applied Data Research, Inc.'s Librariam packages, the vendor said.

Docu/Text-200 produces flowcharts for single-job or multiple-job systems. Output is normally produced on an impact printer using characters to form symbols and connection lines. In addition, Release 3.0 takes advantage of the graphics capabilities of the IBM 3880 and Xerox Corp. 9700 laser printers, the vendor said.

Docu/Text costs between $14,500 and $28,500, depending on options. The vendor is located at Suite 205, 996 Minnesota Ave., San Jose, Calif. 95136.

For HP 3000 Users

Instruction System Released

CINCINNATI — Educational Computer Systems, Inc. has unveiled the CAI/3000, said to be a comprehensive computer-assisted instruction system designed for nonprogrammers that runs on the Hewlett-Packard Co. HP 3000 series under MPE IV or V/3000.

The system uses an instructional dialogue facility to guide the author through lesson creation and testing using step-by-step prompting, the vendor said. At any point, authors can run other programs.

Using an optional interface to HP's V/3000, data entry courses can be developed with the actual screens used by terminal operators. Also, Basic, Cobol or Fortran can be incorporated in a computer-assisted instruction course, a spokesman said.

CAI/3000 is priced between $7,500 and $11,000, depending upon options selected. Discounts are available for educational institutions. Further information is available from Educational Computer Systems, Suite 350B, 8234 Winton Road, Cincinnati, Ohio 45231.

Problems Because of Budget Cuts?

NEED MORE DASD SPACE
- but can't buy

NEED MORE PROGRAMMERS
- but can't hire

NEED MORE ANALYSIS
- but don't have the tools

For more information please
contact Software Module Marketing
Crocker Bank Building/Penthouse,
1007 Seventh Street, Sacramento,
California, 95814, or call Toll Free
800-824-8512. California, Alaska,
and Hawaii call collect
916-441-7234.

Let DMS/OS, the leading DASD Management System, solve your problems.

S.M. M.M.
SOFTWARE MODULE MARKETING

Financial Aids Fit Datamaster

DALLAS — Executive Technology Data Systems, Inc. has announced both financial planning and fixed asset accounting software packages for the IBM System/23 Datamaster.

Both the Finplan Financial Planning and Modeling System and the Fixed Asset Accounting System have been available for IBM's System/34 in RPG-II. They have now been rewritten in Basic for the Datamaster, the vendor said.

The fixed asset package costs $1,000 and the Finplan package costs $1,450 from the firm at 17440 Dallas Pkwy., Dallas, Texas 75252.

Device Driver Targets Graphics

WILSONVILLE, Ore. — Graphic Software Systems, Inc. (GSS) here and Digital Research, Inc. of Pacific Grove, Calif., have announced a device driver development program for makers of graphics peripheral equipment.

In the past, device driver software was often either developed by the peripheral supplier or developed by the end user.

The new program will allow device drivers to be developed by graphics software and operating system specialists and offered to customers through the Graphics System Extension for Digital Research's CP/M operating system.

To participate in the program, a peripheral manufacturer must contact GSS and pay a one-time development fee ranging from $10,000 to $25,000. In addition, the manufacturer must provide GSS with a standard version of its equipment.

There is also a yearly maintenance fee equal to about 25% of the development fee.

GSS is located at 25117 S.W. Pkwy., Wilsonville, Ore. 97070.

Pascal-2 Compiler Unveiled For DEC PDP-11s Under Unix

PORTLAND, Ore. — Oregon Software has announced a Pascal-2 optimizing compiler for Digital Equipment Corp.'s PDP-11 computers running under Bell Laboratories' Unix operating system.

The compiler includes an enhanced version of the firm's source-level interactive debugger.

It features a multipass operation and generates compiled code that is up to 40% smaller and twice as fast as the company's Pascal-1 compiler, a spokesman for Oregon Software said. The debugger allows programmers interactively to solve logic errors in applications.

An execution profiler identifies execution bottlenecks. Other development utilities are also provided, the spokesman said.

License fees begin at $3,950, according to the spokesman for the firm.

Oregon Software is located at 2340 S.W. Canyon Road, Portland, Ore. 97201.

'Info-990' Unveiled for TI Systems

EAST THETFORD, Vt. — Synergistic Systems has announced a new version of its Info-990 data base management package for Texas Instruments, Inc. Business Systems 200 and 300 and DS990 Models 1 and 2 computers.

The new version is said to be 50% faster and supports ascending or descending sorts.

It features field arithmetic during data entry, assorted data entry editors and a built-in text editor for letters and memos, the company said.

The package can sort on up to five fields with combined field indexes of up to four fields and dates in MM/DD/YY format as well as abbreviated format, according to the spokesman for Synergistic Systems.

The package costs $595, the spokesman added.

Synergistic Systems is located at Cobble Hill Road, East Thetford, Vt. 05043.

Eliminates CPU Seizures

Multiterminal Utility Out

ARMONK, N.Y. — A multiterminal, multitasking software utility said to eliminate the seizure of a CPU caused by different terminals making simultaneous updates at the record level has been announced by Exact Systems and Programming Corp.

GO reportedly provides an environment in which multiple terminals may perform different tasks, controls communications with the outside world and provides access to the firm's DNA Data Base Manager.

GO is available on a turnkey basis running on Data General Corp. Micronova, Nova and Eclipse systems, and the Rolm Corp. 1666. The software alone ranges in price from $1,800 to $10,000, depending on configuration, according to a company spokesman.

The vendor is located at One Labriola Court, Armonk, N.Y. 10504.

Sports Package Fits IBM 4341

WATERLOO, Ont. — A sports instruction software package for collegiate and professional applications was recently introduced by the Canadian firm Casi Technology, Inc.

Called Computer Aided Sports Instruction, the package was designed for use on the IBM 4341 and works in conjunction with a Ramtek Model 6211 color graphics terminal.

The sports package allows football, baseball, basketball, hockey and soccer team coaches and players graphics on-line interactive instruction in game fundamentals and strategies, according to the spokesman for Casi Technology.

The basic Casi configuration includes the software, Ramtek Corp. terminal, instruction manuals, training and consultation. Computer Aided Sports Instruction is available for $20,000, the spokesman reported.

Casi Technology, Inc. is located at 210-415 Philip St., Waterloo, Ontario, Canada.

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For information about MRS and SOLOMAN or other ISC products and services call or write:

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311 Maple Avenue West, Suite "B"
Vienna, VA 22180

Information Systems Consultants, Inc.
5812 No. 19th Avenue, Suite "A"
Phoenix, AZ 85015

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"VAX IS HELPING US OPEN UP A WHOLE NEW MARKET."

—LOUIS SCHURE, Vice President,
Computer Graphics Laboratory, Inc.

CGL's new VAX-based Computer-Aided Animation Systems (CAASII) help artists create TV commercials, movie special effects sequences, cartoons and graphics. Faster, cheaper and more efficiently than ever befor

“It takes three [illegible] make a [illegible] to an artist,” [illegible] Schure. “Enough power to [illegible] capture the exact idea he has in mind. Enough speed for realtime playback at every step in the creative process. And easy interfacing with the rather strange peripherals we use in this business. VAX™ systems gave us all three—and at a price that gave us a wide open market.

“The fact that VAX is a family of products with consistent operating and application code environments has also been very important. We sell VAX-11/780s for 3D modeling. VAX-11/750s for animation. And we'll have the new VAX-11/730s for our smaller systems. These products make us one of the leading OEMs in computer art and technology. With Digital's service and support around the world there's almost no limit to our market.

“With 32-bit addressability and virtual storage, VAX can create images you simply can't tell are computer-generated,” he says. “The artist can use an infinite number of brush strokes. Millions of colors. Any number of overlays. Each frame can be flopped, enlarged or reduced, zoomed, panned or erased in realtime.”

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Today VAX is many success stories. To learn more about the art of computing at Digital, call toll-free: 1-800-DIGITAL, extension 200. Or write: Digital Equipment Corporation, 200 Baker Avenue, Attention: Media Response Manager, CF01/M94, West Concord, MA 01742.

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Designed for Novice Users

Authoring System Announced

STILLWATER, Minn. — Phoenix Performance Systems, Inc. has released a computer authoring system designed for novice computer users.

The Author reportedly allows nontechnical, inexperienced users to create on-screen, interactive computer lessons in less than a day. Through menu-driven functions and screen prompting, users learn to produce menu screens, four types of question screens to provide for automatic branching to additional instruction and narrative instructional screens, the vendor said.

Software for the Burroughs Corp. B20 computer costs $600/CPU; for the Apple Computer, Inc. Apple II Plus, $195/CPU; and for the IBM Personal Computer, $195/CPU. Phoenix is located at Suite 1, 324 S. Main St., Stillwater, Minn. 55082.

Farming Aid Fits System/23

HOUSTON — Agridata Systems, Inc. has announced a cattle breeding inventory system that runs on the IBM System/23 Datamaster.

The system reportedly identifies each animal, retaining breeding attempts, expected calving data and last calf identification.

The cattle breeding inventory system costs $2,500 from Agridata at 8989 Westheimer, Houston, Texas 77063.

Modeling Aid Designed For Calcomp's IGS 400, 500

ANAHEIM, Calif. — The Systems Division of California Computer Products, Inc. has announced a three dimensional solid modeling software package designed for use on the firm's turnkey computer-aided design systems, the IGS 400 and 500.

Based on a plan, view or elevation, or a combination thereof, displayed on the IGS graphics screen, the model is built up interactively by the user. As the model is created, an isometric wireframe is displayed, allowing error-checking as the design progresses.

Once completed, the wireframe drawing reportedly can be converted automatically into solid models.

The software costs $12,500 from the firm at 2411 W. La-Palma Ave., Anaheim, Calif. 92801.

'Innopak' Announced

GREENSBORO, N.C. — The Innovators have announced the Datapoint Corp. Resource Management System (RMS) and 1500 releases of Innopak, its computer-aided design and development system for users of Datapoint systems.

Innopak consists of three primary programs plus supporting software. The system reportedly allows users to decide the types of methods, techniques, standards and features that should be included in their Databus programs. It is also said to provide a full-screen editor and several word processing features to help the user design data entry screens and report formats.

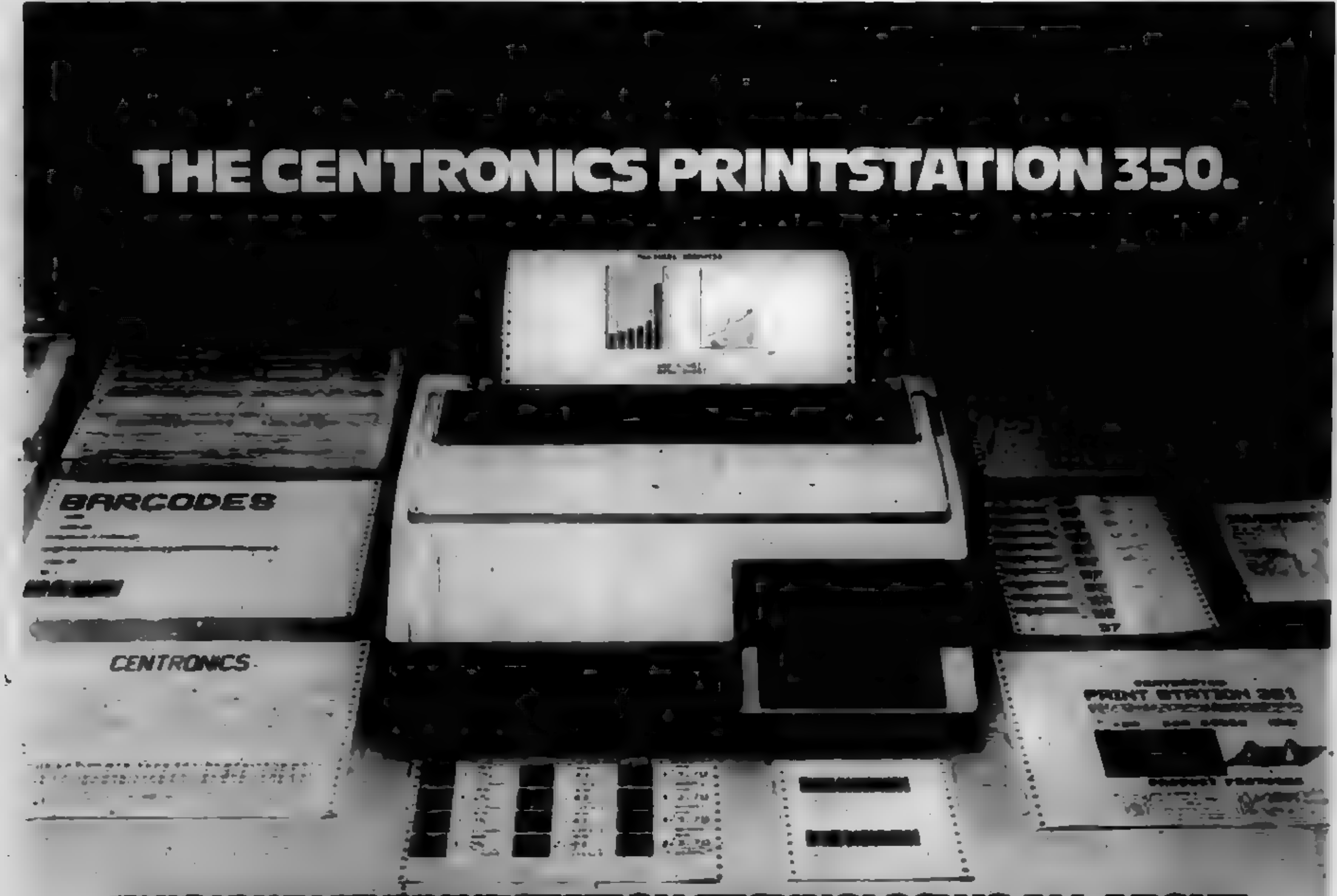
Innopak is priced at $5,000 for the RMS version, $4,000 for the Datapoint DOS version and $2,500 for the 1500 version, from the vendor located at 3407 W. Wendover Ave., Greensboro, N.C. 27407.

System/34 Users Get Apparel Aid

NEW YORK — Apro Systems, Inc. has unveiled a menswear apparel management package designed to run on the IBM System/34.

The package is a complete system, including order entry, allocation and billing, accounts receivables, sales analysis, finished goods inventory and production with piece goods inventory and accounts payable options available, according to the vendor spokesman.

The on-line, menu-driven package can be customized. The package prices start at $32,000. Apro Systems is located at 1400 Broadway, New York, N.Y. 10018.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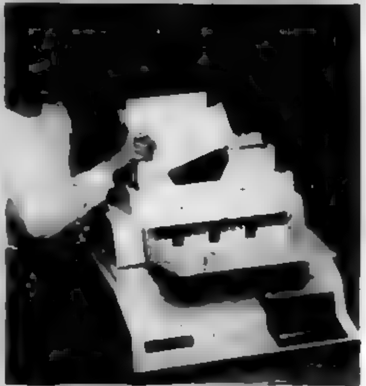

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Whether in an office or on a loading dock, whatever a business needs, a Printstation 350 will print: ▫ Bar code tickets ▫ Mailing labels ▫ Insurance forms ▫ Purchase orders ▫ Sales charts & graphs ▫ Invoices . . . on business cut sheet, instant tear-off and sprocket-feed forms . . . with graphics . . . and without afterthought options.

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System/34 Gets Test Generator

TOMS RIVER, N.J. — Creative Management Systems has announced the addition of the Data/34 interactive test data generator to its line of IBM System/34 software.

The menu-driven product is said to aid the task of building data files for program testing by providing 11 variations of data generation for both numeric fields and alphanumeric fields.

Using a series of prompts and screens, Data/34 reportedly allows the programmer to select files for which data is to be generated and define the type and value of data to be generated for each field in a record. Data/34 then builds a program that generates the test file.

Data/34 is available for a one-time, one-CPU charge of $500 with a 30-day money-back guarantee: Creative Management Systems is located at 230 Main St., P.O. Box 10, Toms River, N.J. 08753.

Documenter Out For System/38

CHICAGO — Advanced Systems Concepts, Inc. has introduced a documentation package designed for users of the IBM System/38.

The Abstract/38 is said to provide program and data base information using an interactive menu-driven approach. Program-level documentation includes procedure explosion reports and inquiries, "where-used" listings, sample report outputs and source code listings.

The data base structures are also documented through file dependency reports, usage reporting and record format documentation.

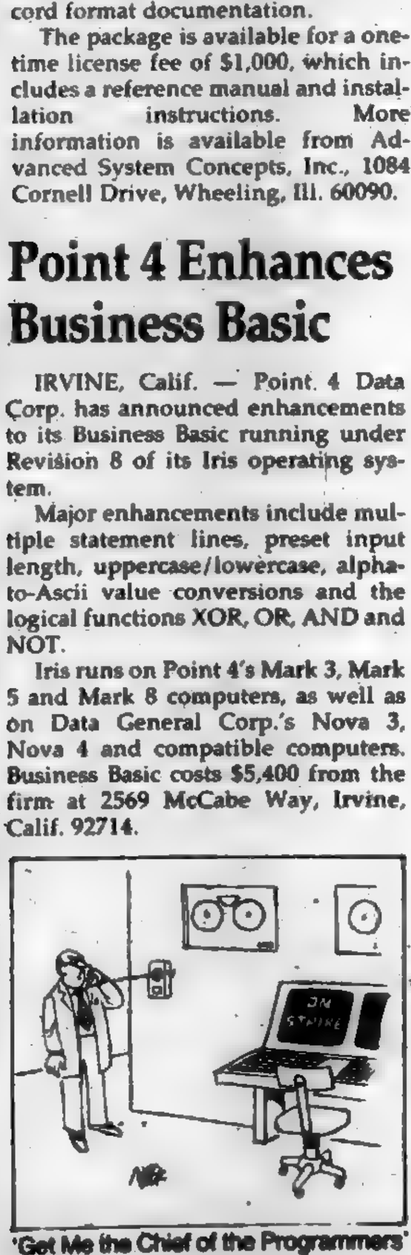
The package is available for a one-time license fee of $1,000, which includes a reference manual and installation instructions. More information is available from Advanced System Concepts, Inc., 1084 Cornell Drive, Wheeling, Ill. 60090.

Point 4 Enhances Business Basic

IRVINE, Calif. — Point 4 Data Corp. has announced enhancements to its Business Basic running under Revision 8 of its Iris operating system.

Major enhancements include multiple statement lines, preset input length, uppercase/lowercase, alpha-to-Ascii value conversions and the logical functions XOR, OR, AND and NOT.

Iris runs on Point 4's Mark 3, Mark 5 and Mark 8 computers, as well as on Data General Corp.'s Nova 3, Nova 4 and compatible computers. Business Basic costs $5,400 from the firm at 2569 McCabe Way, Irvine, Calif. 92714.



'Get Me the Chief of the Programmers' Union!'.

Production Aids Fit System/23, 34

SOUTHFIELD, Mich. — Intro-Logic, Inc. has introduced two self-installing Manufacturing Systems, one for the IBM System/23 and one for the System/34.

Modules included in the systems are inventory control, production scheduling, material requirements planning, vendor management and purchase order release management.

Each product comes in two versions: one for the Process Environment and one for the Repetitive Environment. Demonstration packages are available at $50 for the System/23 version and $100 for the System/34 version.

, Prices for the systems are $5,000 for the System/23 version and $7,000 for the System/34. The firm is located at 24700 Northwestern Highway, Southfield, Mich. 48075.

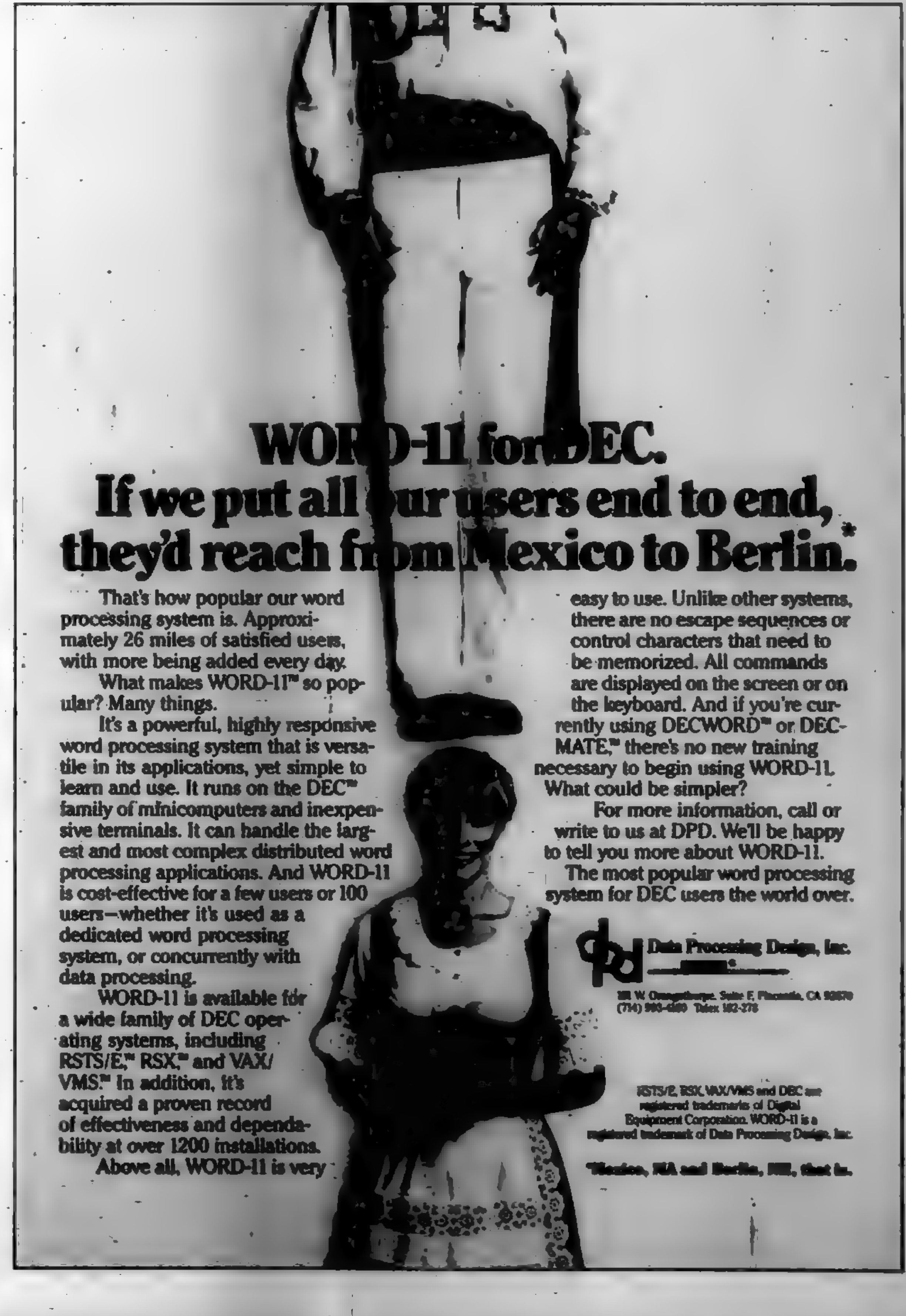
Ask Computer Adds Payroll To Management System

LOS ALTOS, Calif. — Ask Computer Systems, Inc. has announced the addition of a payroll system said to process any size payroll and any combination of pay frequencies to its turnkey Manman financial management system.

Manman/Payroll reportedly calculates pay, provides on-line or hard-copy reports and maintains a complete employee earnings history. It supports federal, state and local taxes, allows an unlimited number of deductions and provides rate tables.

Also provided are an unlimited number of user-defined calculations for establishing pay requirements.

The system license fee is $15,000; the software-only license is $20,000. More information is available from Ask Computer Systems, 730 Distel Drive, Los Altos, Calif. 94022.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If we put all our users end to end, they'd reach from Mexico to Berlin.*

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It's a powerful, highly responsive word processing system that is versatile in its applications, yet simple to learn and use. It runs on the DEC™ family of minicomputers and inexpensive terminals. It can handle the largest and most complex distributed word processing applications. And WORD-11 is cost-effective for a few users or 100 users—whether it's used as a dedicated word processing system, or concurrently with data processing.

WORD-11 is available for a wide family of DEC operating systems, including RSTS/E,™ RSX,™ and VAX/VMS.™ In addition, it's acquired a proven record of effectiveness and dependability at over 1200 installations.

Above all, WORD-11 is very easy to use. Unlike other systems, there are no escape sequences or control characters that need to be memorized. All commands are displayed on the screen or on the keyboard. And if you're currently using DECWORD™ or DECMATE,™ there's no new training necessary to begin using WORD-11. What could be simpler?

For more information, call or write to us at DPD. We'll be happy to tell you more about WORD-11.

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Data Processing Design, Inc.

[illegible] W. Orangethorpe, Suite F, Placentia, CA 92670
(714) [illegible] Telex 182-278

RSTS/E, RSX, VAX/VMS and DEC are registered trademarks of Digital Equipment Corporation. WORD-11 is a registered trademark of Data Processing Design, Inc.

*Mexico, MA and Berlin, NH, that is.

Micro Notes

ABS/86, a business package of accounting, word processing, spreadsheet and tutorial applications, has been introduced by Altos Computer Systems, Inc. for its 16-bit ACS8600 multiuser microcomputers. It costs $4080 from Altos at 2360 Bering Drive, San Jose, Calif. 95131.

Micropro International Corp. has announced that its **Wordstar** word processing package is now available on Digital Research, Inc.'s 16-bit operating system, CP/M-86. The CP/M-86 version costs $495. Other products that are compatible with the product are the **Spellstar** spelling checking program and **Mailmerge**, a file merging package which cost $250 each. The vendor is located at 33 San Pablo Drive, San Rafael, Calif. 94901.

STSC, Inc. has announced the release of an extended APL language for the IBM Personal Computer with at least 128K bytes of random-access memory and at least one disk drive, under the PC DOS operating system. STSC's **APL*Plus/PC System** is functionally compatible with APL*Plus running on mainframes. The APL*Plus/PC System, including the APL language processor, an APL character read-only memory and documentation, is available for $595, the vendor said from 2115 E. Jefferson St., Rockville, Md. 20852.

Comshare, Inc. has released **Target Financial Modeling**, its microcomputer spreadsheet software, for the IBM Personal Computer and Digital Equipment Corp's. Rainbow. Featuring English commands, the software costs $325. For an introductory price of $50, users can buy an applications guide from the firm at 3001 S. State St., Ann Arbor, Mich. 48106.

Omega Microware, Inc. has introduced expansion software for the Apple Computer, Inc. Apple II using Visicorp's Visicalc and the firm's Ramex 128 memory expansion board. **Super Expander Plus** was developed to enable users of Visicalc to expand memory to either 136K or 255K bytes, the vendor said. Super Expander Plus costs $125 from the firm at 222 S. Riverside Plaza, Chicago, Ill. 60606.

Microstuf, Inc. has introduced **Transporter**, software said to allow IBM Personal Computer-to-computer communication with no operator intervention at either end. It requires an IBM Personal Computer with at least 64K bytes of random-access memory, two disk drives, Microsoft, Inc.'s MS-DOS and IBM Asynchronous Communications Card or equivalent RS-232 card. The product costs $295 from the firm at Suite 205, 1845 The Exchange, Atlanta, Ga. 30339.

A spreadsheet modification program for the IBM Personal Computer has been developed by Funk Software, Inc. **Sideways** is said to eliminate the problem of spreadsheets that are wider than their printers. Sideways costs $60 from P.O. Box 1290, Cambridge, Mass. 02238.

The Small Computer Company, Inc. has announced a Digital Research, Inc. CP/M data base management software package for the NEC Information Systems, Inc. PC-8000A personal computer. The menu-driven **Filepro** requires a PC-8000A with 64K bytes of random-access memory and two disk drives and costs $199 from 40 W. Ridgewood Ave., Ridgewood, N.J. 07450.

Micropert O is an interactive menu-driven graphics-oriented project scheduling package for the IBM Personal Computer. It costs $500. Further details are available from Sheppard Software Co., 4750 Clough Creek Road, Redding, Calif. 96002.

Radio Shack has announced three programs said to enhance the Profile Plus data base management system for the TRS-80 Model II microcomputer. **Profile Prosort** is an indexing program said to permit sorting and selecting records from any segment of a file. It costs $149. **Profile Forms**, priced at $125, prints one detailed report per sheet on each item in the file, rather than a one- or two-line listing. **Profile Archive**, costing $49, allows the user to purge inactive records from any file in Profile Plus. The firm is headquartered at 1800 One Tandy Center, Fort Worth, Texas 76102.

An IBM Personal Computer PC-DOS version of Bytek, Inc.'s Cogen Cobol Program Generator has been announced by the firm. **Cogen** works in conjunction with Ryan-McFarland Corp. RM/Cobol. The PC-DOS version of Cogen costs $950 from Bytek at 1714 Solano Ave., Berkeley, Calif. 94707.

Intel Corp. has introduced **personal software kits** to run on Intel development systems. The kits, containing Digital Research, Inc.'s CP/M operating system and Micropros's Wordstar and Multiplan software, will reportedly convert Intel development systems into engineering and office tools. This package is priced at $995, the vendor said from Department D-10, 3065 Bowers Ave., Santa Clara, Calif. 95051.

A multiuser, multitasking development operating system designed for use with Motorola, Inc.'s 68000 16/32-bit-based CPUs has been announced here by Eyring Research Institute, Inc. **Pdos** includes the Pdos Basic interpreter, floating point processing, file management and user monitor modules. It costs $1,500, and the vendor is at 1455 W. 820 North, Provo, Utah 84601.

Pathfinder Associates has developed a **utility program** to provide a backup to hard disk on a set of floppy disks ($135) and the **Codelock** security system designed to reduce the incidence of unauthorized software duplication ($2,000). Both products run on standard Ascii terminals. These packages are being distributed by the Computer Corner Ltd. through P.O. Box 8655, New Haven, Conn. 06531.

Corona Data Systems, Inc. has announced that two software packages aimed at the Apple Computer, Inc. Apple II microcomputer will now run on its Starfire system: Stoneware, Inc.'s **DB Master** ($449) data base management system and Visicorp's **Visicalc** ($250). The latter reportedly requires the **Transporter** ($49.95) utility from Omega Microware. Corona is based at Suite 110, 31324 Via Colinas, Westlake Village, Calif. 91361.

Laminex puts security control in your hands.

That means "hands off" for everybody else in your organization. And that's a vital security feature in itself. No more keys to be lost, stolen or duplicated. No more locks to be silently picked. No more doors deliberately left open.

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Versatility is built in to your Laminex access cards. They can serve as a Photo ID Badge as well as providing for data collection and time and attendance.

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Here's another important feature. Your Laminex access cards are made with tough polyester. They resist cracking and deterioration even under adverse conditions. And they protect you from routine card duplication — an excellent security feature in itself.

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Every morning's headlines underscore the fact that crime is increasing all across America. That's why management people like you are taking steps to strengthen security.

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Your Laminex Access Control System is a simple, economical, effective solution that translates computer technology into access control designed for your everyday use. It won't solve all your security problems. But when you combine it with other security practices, you'll have protection for life and property that's really extraordinary.

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DATA IS MONEY

Why and how money becomes data in the banking system.

By James Bradley

Our narrative concerns the early years of an imaginary island republic in the Pacific called Westhaven. It was originally claimed by most of the Pacific nations, but since it was never established just whose nationals set foot on the island first, and since it appeared to have no strategic or economic value of significance, the island was eventually allowed to join the community of nations as an independent republic.

Immediately after the independence festivities were over, the Westhaven president Mr. Bigger met with a consultant from a large New York bank. The problem was the usual one — the Westhaven government had only a small quantity of U.S. dollars in its treasury and was almost insolvent. In the rush for an independent republic, no thought had been given to the new na-

This article is excerpted from the forthcoming book, Introduction to Data Base Management in Business, by James Bradley, copyright © 1983 by Holt, Rinehart and Winston. The book will be available beginning March 1 for $26.95 from Holt, Rinehart and Winston, CBS Educational and Professional Publishing, 383 Madison Ave., New York, N.Y. 10017.

tion's currency or, indeed, if it should have a currency at all. Before independence, many different currencies from the Pacific nations were in use, although U.S. dollars were the most common.

Mr. Bigger's reason for calling in the banking consultant was to find out how to go about arranging a sizable loan from an American bank. Because of the weak Westhaven economy and the high cost of such a loan, the consultant advised against such a course and instead recommended that the country set up its own currency.

The consultant explained that the government should found a new institution called a central bank, to be called the Westhaven Central Reserve Bank, with a staff of two and a printing press for printing the new currency. The new currency unit was the Westhaven dollar, equal in value to an American dollar, at least in the beginning. The bank staff was to consist of a chairperson and a clerk. Before leaving, the consultant warned about abuse of the central bank's right to print money, as this would eventually lead to collapse of the currency and economic ruin, and recommended that the bank chairperson should be a financially responsible person with a tenured position.

The necessary legislation was quickly passed by the island's congress, and the president appointed a financial conservative called Mr. Meager as chairperson of the Westhaven Central Reserve Bank. The next day, Mr. Bigger went to see Mr. Meager about a loan of W$9,000 for the government. The business was quickly transacted, but not before Mr. Meager gave Mr. Bigger a stern lecture on the evils of profligate government spending. The essentials of the transaction were as follows:

1. Mr. Bigger deposited a newly printed government bond with the central bank. This bond had a face value of W$9,000, paid 3% annually and was secured by government property.
2. The clerk gave Mr. Bigger W$9,000 in newly printed bank notes and made the relevant entries in the bank's books.

The government used the W$9,000 cash to meet its expenses, including payroll, so that in a short time, the new money was in circulation throughout the republic. To ensure that the new money was accepted by the population, the legislation setting up the central bank stipulated that the new money was acceptable for the discharging of debts and for the payment of taxes to the government. In the course of time, even more money was borrowed from the central bank by the government. However, because of Mr. Meager's sound management, no more money was printed than was needed for the business activities of the country. The currency was a success, inflation was low and so were interest rates.

We can learn something of the nature of money from the monetary history of Westhaven so far. First of all,

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Funny how programming grows on you.

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And if you haven't got a way to keep it all under control, well, you could have a real nightmare on your hands.

The fact is, without an efficient, well thought out approach to managing project materials at your workstation, you can easily waste up to 25% of your time just trying to keep all that information under control.

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what may be used for money is simply whatever that government says can be used. Through legislation, the Westhaven government declared that the new Westhaven dollar was to be considered money, and so it became money. Nevertheless, this dollar was only a rectangular piece of paper with an intricate pattern embedded in it. To this we can add the standard definitions of money:

1. It can be used as a medium of exchange.
2. It can be used as a store of value, although in times of inflation, the wisdom of using it for this purpose is questionable.
3. It can be used to measure the value of items that can be exchanged.

The Westhaven dollar easily satisfies these definitions. The government used it to pay its employees, who, in turn, used it to buy goods from merchants. The merchants were willing to accept the new money in return for their goods, because they knew that the law of the land permitted them to use it to discharge debts and pay taxes. Thus, it became widely used as a medium for exchanging goods and services. Because of the wise management of Mr. Meager, the population knew that the Westhaven dollar could be used next year as well as this year, and so it became a convenient store of value for future use.

Finally, because goods or property that had been sold could be compared with other goods and properties not currently for sale, it was possible to assign a value in Westhaven dollars to such entities. In this way, the Westhaven dollar could be used as a measure of value.

The method used by the Westhaven government and the central bank to create money — or *increase the money supply,* if we want to put it technically — is the one used by most countries. Notice that the books of the central bank are balanced in this process. Neglecting its printing press, the Westhaven Central Reserve Bank had zero assets and zero liabilities when it was founded. Following the creation of the first W$9,000, its books showed:

ASSETS	LIABILITIES
9,000	9,000

The bank asset is the W$9,000 government bond, while its liability is the W$9,000 cash issued to the government. This cash is a liability to the bank, since one day the government could present the cash to the bank and demand its bond back. If the government were to do this, the books of the bank would show once again:

ASSETS	LIABILITIES
0	0

W$9,000 would literally have been destroyed. This illustrates the great principle and the great mystery behind the management of the money supply. When the central bank buys bonds from the government (or from any other person), money is created. When the central bank sells bonds to the government (or to any

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other person), money is destroyed.

Many readers may feel somewhat uneasy about this apparent creation of money out of thin air, for our ordinary experience is that we have to work very hard for every dollar we have. However, it is untrue to say that the Westhaven Central Reserve Bank created the money out of thin air. It is more exact to say that it created it by using a special type of paper and various inks. As we shall see, it can also be created on a disk track.

The ability of the central bank to destroy money is an even harder concept to digest, for it is completely contrary to our everyday experience with money. We have often heard: "The money must have gone somewhere; it can't just disappear." Well, it can.

Money in Data Bases

There is another way in which money is commonly created in a modern society, and it is this type of money that is commonly stored in data bases. To find out about it, we continue with the monetary development of the Republic of Westhaven.

Following the successful issue of the new currency from the central bank, cash in the form of Westhaven dollar bills was freely circulating. Nobody used checks at this stage, because there were no commercial banks. At this point, one of the island's leading citizens, a Mr. Rich, decided to found a bank. He outlined his proposal to Mr. Meager at the central bank, who made recommendations to the president, who initiated legislation in the congress. The legislation provided for the creation of the First National Hamlet Bank, with branches throughout the island.

The bank's initial capital was to be W$1,000, it would be allowed to borrow from the central bank and it had to keep reserves at a figure that would be set by the central bank. Mr. Rich would have liked to have been able to print money just like the central bank, but the legislation specifically denied him the right to do this. However, he soon found out that he could create money in another way, connected with those "reserves" mentioned in the founding legislation.

The primary need of the citizens of Westhaven was for a safe place to deposit their money, and Mr. Rich provided this. Soon there were three depositors, a Mr. Green, a Mrs. Brown and a Mr. Black, who deposited W$2,000, W$3,000 and W$4,000, respectively, for a total of W$9,000. Each sum was placed in its own deposit box with a label indicating the owner. The bank charged the depositors a fee for the privilege of having their money in safekeeping, which they reluctantly paid.

Mr. Rich soon found that his business was not very profitable and called in a consultant from a New York bank. The consultant explained that the so-called First National Hamlet Bank was not operating as a modern bank should; rather, it

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ASSETS	Asset Type	LIABILITIES	Depositor
10,000	Cash	—	
		2,000	Mr. Green
		3,000	Mrs. Brown
		4,000	Mr. Black
10,000		9,000	

Figure 1

ASSETS	Asset Type	LIABILITIES	Depositor	Borrower
10,000	Cash	—		
		2,000	Mr. Green	
		3,000	Mrs. Brown	
		4,000	Mr. Black	
6,000	Loan	—		Mrs. Quick
		6,000	Mr. Builder	
16,000		15,000		

Figure 2

was operating as a depository. Thus if Mr. Black deposited a certain W$10 bill at the bank, he could be sure that he would get that exact W$10 bill back later and not some other bill. In the same way, if a person deposits a coat at a checkroom, he expects to get the same coat on checking out and not some other coat.

Following his talk with the consultant, Mr. Rich began to operate his business as a modern bank. The deposits of his customers were placed in a single deposit box, and how much each person had deposited was recorded in the bank's books as shown in Figure 1.

We see that the bank's excess of assets over liabilities is W$1,000, the firm's initial capital. The consultant had pointed out that on balance, depositors never use all the money they have deposited, so that it was safe for the bank to lend some of it at interest. Interest could also be paid to the depositors to encourage them to keep their deposits in the bank and perhaps even encourage further deposits.

Anyway, a short time later, the bank lends W$6,000 to a Mrs. Quick, who uses the funds to pay a contractor, Mr. Builder. Mr. Builder now opens an account with the bank and deposits his W$6,000. The bank's books now have entries as shown in Figure 2.

Here we have the apparent magic of commercial banking: By the simple process of lending W$6,000 in existing cash, a further W$6,000 of new money is created by the bank. This is clear from the fact that the bank is now liable to each of its four depositors for a total of W$15,000. Each of these four people believes that the bank has the money he deposited. And so he has, but not in cash. The bank has only W$10,000 in cash and were each of the depositors to come and attempt to withdraw his funds in cash, the bank could not pay. However, in practice, such an attempt at mass withdrawal or "run" will normally not happen, since bank patrons deposit funds they are not currently using.

This creation of money by a commercial bank by the process of lending has been much discussed and widely misunderstood. Many bankers will even deny that they are capable of creating money, but there is no doubt that they can. The question that is important to data base administrators is where exactly this newly created money resides. Clearly, it is not in cash in the bank's deposit box or vault.

Without going into a detailed analysis, we may perceive that the bank has created it by a process of time-sharing its cash assets: Depositors cannot all use the cash at the same time, but it is all right for them to use it at different times, which is what they will need to do in practice.

Nevertheless, we cannot argue from this that the depositors do not have all their money in the bank. The depositors believe their money

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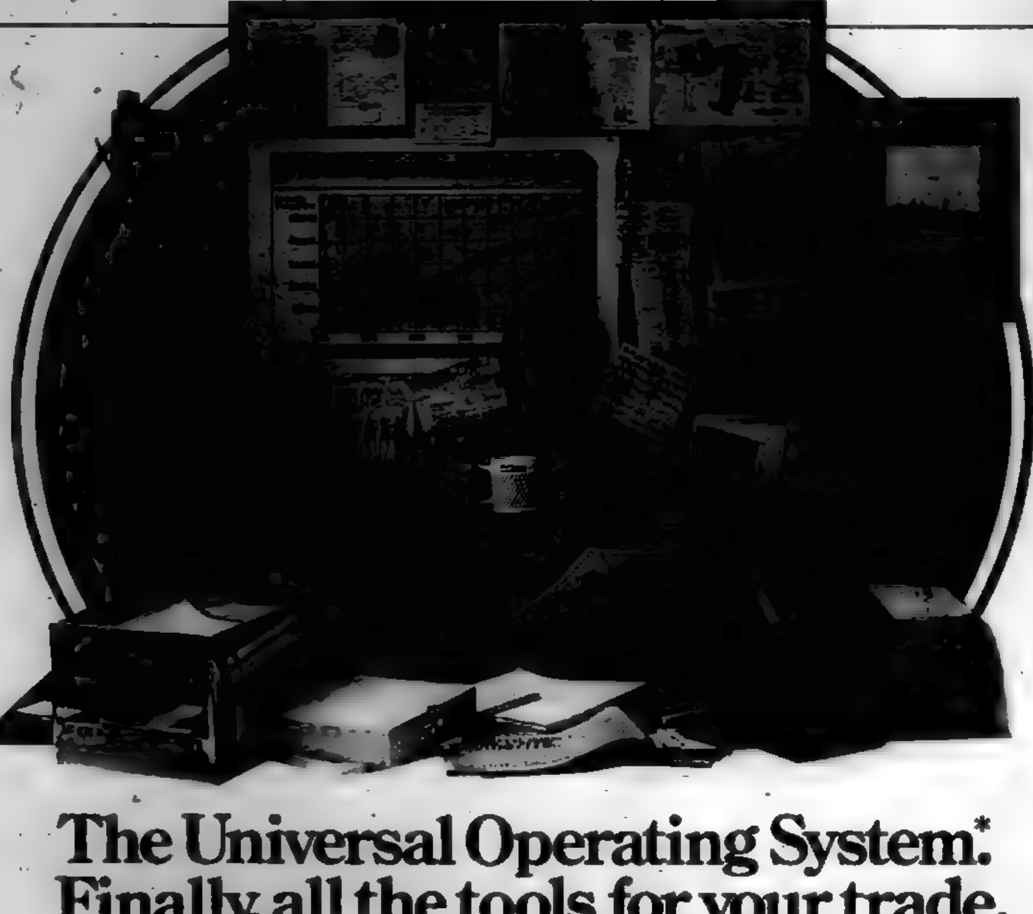

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is in the bank; the bank is legally liable to pay it back; the depositors know from experience that they can get it; and, in addition, in most advanced countries, deposits are insured (up to $100,000 in the U.S.). Thus, we must accept that money has been created, and that it is not in cash. The only conclusion is that the funds reside in the bank's books in paper and ink. To see what this can lead to, let us return to the activities of the First National Hamlet Bank.

When Mr. Builder deposited the $6,000 that had been loaned to Mrs. Quick, the bank noticed that it had the same cash assets (or "reserves") that it had before the loan and so loaned some additional funds to another borrower. These funds, too, were eventually deposited by a new depositor. Additional funds were loaned, which came back in the form of new deposits, until one day the bank's position was as shown in Figure 3. The bank's assets still exceed its liabilities by its W$1,000 initial capitalization, and we have neglected the effect on its assets of interest paid to the bank. However, the process of making loans and accepting new deposits has caused deposits to grow to W$50,000 — that is, five times the amount of cash reserves. In other words, the bank has created W$41,000.

By permitting further borrowing, the bank could create even more money, but the process is severely limited by the central bank, and in most advanced nations, deposits are limited to around five times the reserves. If the limit were 20 times, for example, every W$20,000 in deposits would be backed by only W$1,000 in cash, which would make the risk of a run on the bank very real. In the U.S., the Federal Reserve System (the American central bank) controls this all-important reserve ratio.

The Federal Reserve uses this to exert powerful control over the nation's money supply. If the Federal Reserve creates $1 billion by buying bonds from the government, when the government places this money in circulation by paying its bills, it ends up in the commercial banks, which use it to create an additional $4 billion. Conversely, the sale of $1 billion worth of government bonds by the Federal Reserve eventually causes the supply of money to fall by $5 billion.

From this brief story of the First National Hamlet Bank, we can see that most (that is, about 80%) of the depositor's money is not cash and is simply entries on the bank's books.

More Players, More Complexity

We assumed that the bank was the only commercial bank in Westhaven in order to come quickly to the heart of the matter. Had there been two banks, they would both have created money by the process of lending. However, the mechanism would have been more involved, although the result would have been the same.

ASSETS	Asset Type	LIABILITIES	Liability Type
10,000	Cash reserves	—	
—		50,000	Total deposits
41,000	Loans and bonds	—	
51,000		50,000	

Figure 3

When bank-A loaned money to a borrower, the borrower would buy something with it as before. However, the new owner of the money might well deposit it in bank-B, so that this alone would not increase bank-A's deposits.

But if at the same time, bank-B was lending money to another borrower who spent the funds which were then deposited in bank-A, this would compensate for the deposit bank-A lost to bank-B and vice versa. In this way, the granting of loans by bank-A and bank-B causes the deposits of both banks to grow even though their reserves are not significantly changed. A full description of the mechanism when many banks are involved is beyond the scope of this article, although it is fundamentally similar to what we have already described. For the purpose of explain-

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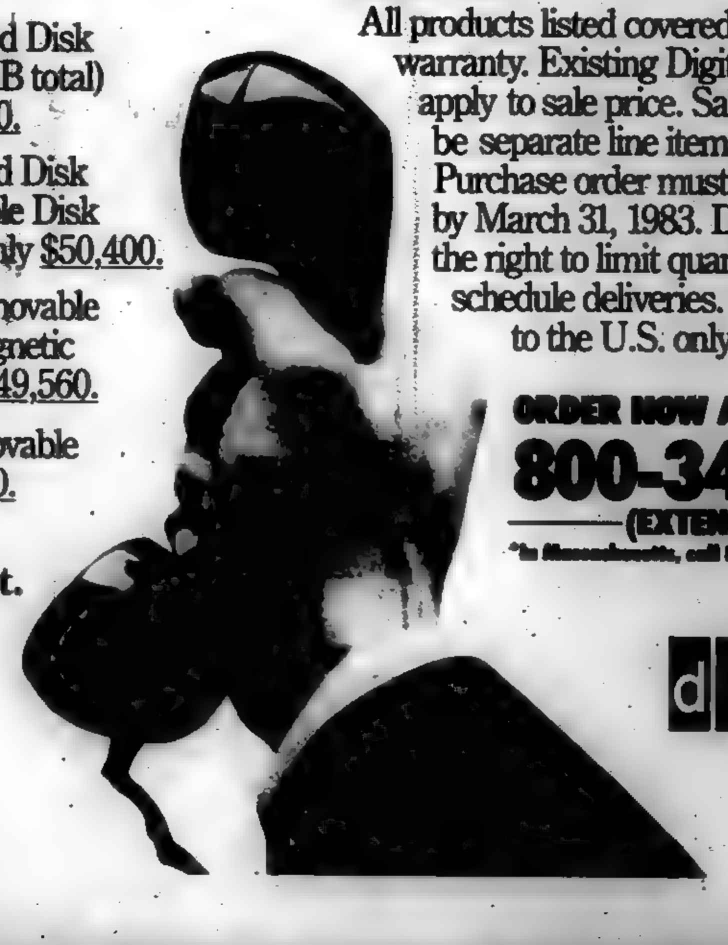

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> ***'So where is the money in an account actually located? There is only one inescapable conclusion: It is in the data base, physically stored on a disk track.'***

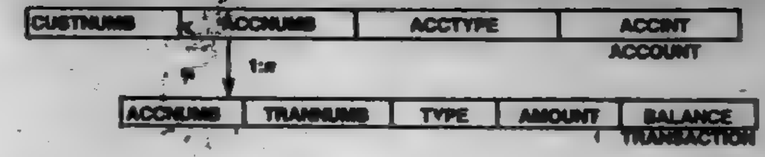
ing the principles involved, we shall therefore continue with the assumption that Westhaven has only one (monopoly) commercial bank.

Enter the Computer

With the passing of time and sound management on the part of the government and the central and commercial banks, the economy of Westhaven prospered, and the branches of the First National Hamlet Bank multiplied. At the same time, the use of checks for paying bills and for business transactions became the norm, and cash was used only for minor transactions. Thus, when Mr. Green paid Mr. Black W$1,000 by check, all that happened at the bank was an updating of the accounts of Mr. Green and Mr. Black: Green's account balance was reduced by W$1,000 and Black's was increased by the same amount. Money had become numbers in ink on paper, and the circulation of money merely involved updating the numbers. And so a modern money system evolved in Westhaven.

Soon the sheer volume of paperwork involved began to cut into the bank's profits, and at the main branch, a computer was installed to help. An army of specialists came with the computer. The systems that were designed in the beginning were simple and resulted in substantial savings. This led to the usual demand for more ambitious systems. But in time, there was duplicate data in files used in different applications; development of new applications became slower and more costly; the bulk of the computer center's staff labored just to keep the old systems running; and complaints about errors multiplied.

A consultant was hired to help, and she recommended a switch to data bases and the establishment of a data base administration group. In time, a number of data bases were constructed, and one of them contained data about customer accounts as shown in Figure 4, which shows only part of the data base.



(a) Two relations from a data base at the First National Hamlet Bank. For each account there are normally many transactions. A transaction can be a deposit or withdrawal transaction (TYPE field). AMOUNT is the amount of funds involved, and BALANCE is the account balance when the transaction has been completed. CUSTNUMB is the number of the customer holding an account. ACCNUMB gives the number of an account. ACCTYPE gives the type of account and ACCINT gives the interest paid, if any.

CUSTNUMB	ACCNUMB	ACCTYPE	ACCINT
C10	A6	CHECKING	0
C13	A8	SAVINGS	10

ACCNUMB	TRANNUMB	TYPE	AMOUNT	BALANCE
A6	T11	DEP	1000	9000
A6	T15	DEP	700	9700
A6	T27	WITHD	2000	7700
A8	T13	WITHD	3000	8000
A8	T17	DEP	1000	7000

(b) Some data from the relations ACCOUNT (left) and TRANSACTION (right) from the data base in (a). The data base shows that customer 'C10' has W$7,700 in account A6 at the bank. However, because the W$7,700 does not exist in cash at the bank, the money is actually stored in the data base as magnetic alignments on a disk track.

Figure 4. A Data Base Containing Money as Well as Data

In Figure 4, we have an extended Bachman diagram for the relations ACCOUNT and TRANSACTION, and we show some data for several accounts and transactions related to these accounts. For any account, there are typically many transactions, so that there is a one-to-many relationship between ACCOUNT records and TRANSACTION records. For any account, each associated TRANSACTION record contains the account balance at the completion of the transaction. Thus, the record for the latest transaction on an account contains that account's current balance. For example, we can see from Figure 4 that account number A6 currently has a balance of $7,700.

The balance in account A6, like that of other deposit accounts, is simply one of the many deposits in the bank that came into existence because of the creation of money by the granting of loans by the bank. (For the U.S. with its many commercial banks, the deposit would have come into existence because of loans by the aggregate of banks — that is, by the banking system.) The deposit is not backed by cash, because the total deposits in the bank will likely be five

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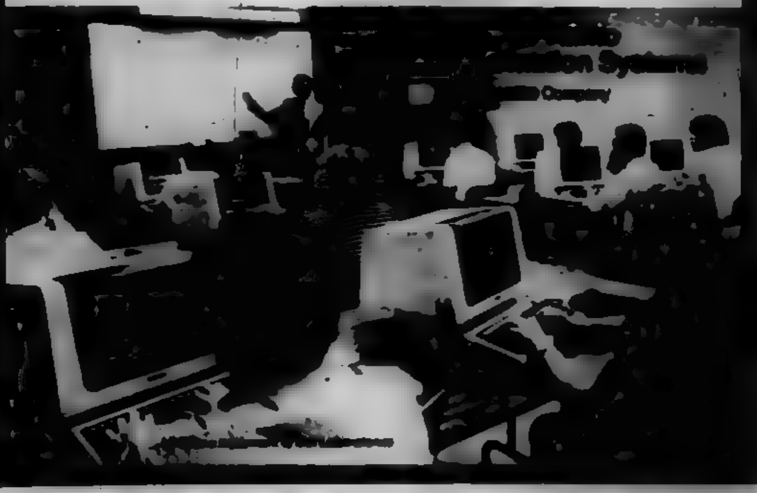

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times its reserves, and most likely, those reserves will not be in cash, but in deposits of the First National Hamlet Bank with the Central Reserve Bank of Westhaven. That is, the commercial bank has the right to have the central bank print money up to the amount of its deposits with the central bank.

So where is the money in an account actually located? There is only one inescapable conclusion: *It is in the data base, physically stored on a disk track.*

This has one serious consequence for the modern banking system: It makes it possible to rob a bank by accessing its data base and carrying out certain updating operations, the details of which are perhaps better left unwritten. Of course, in the old days when money was stored in ink on the paper of the bank's books, it was possible to rob the bank by updating its books. However, this was very difficult to do, especially for nonemployees; even for employees it was difficult, for only a few had access to the books. Thus, whenever it did happen, the number of suspects were few, and consequently, the probability of early detection was high. The situation is completely different when the funds are stored in data bases.

A determined and innovative computer criminal could, in theory, work from a remote terminal, break the data base security system and transfer funds (electronically) out of the bank to another bank and then, by more legal means, out of the country to some safe offshore haven. An auditor would undoubtedly detect the loss, and with the help of the data base administration group, could determine exactly how it happened. But by that time, the money would have flown and, for many in business, the mechanism of its disappearance would be as mystifying as the mechanism by which it was created.

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About the Author

Dr. James Bradley is an associate professor in the Computer Science Department at the University of Calgary, Alberta, where he gives courses on both files and data bases.

He has both industrial and commercial experience and has published widely on the subject of data base management. He invented extended Bachman diagrams and the EOS retrieval language, which uses implicit owner-coupled sets to ease the task of expressing retrievals from relational data bases. ‡

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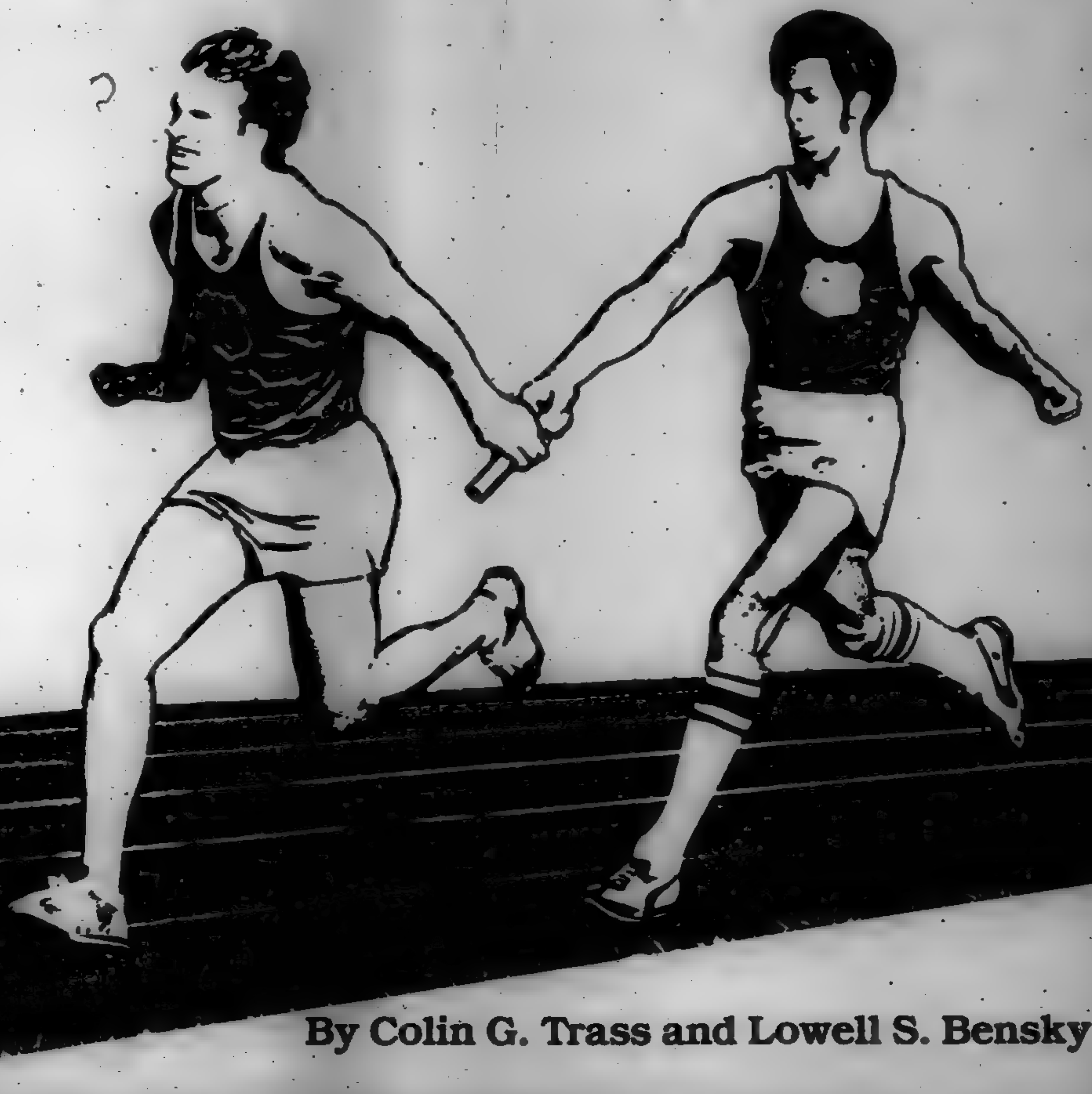
A Design Approach to Fault Tolerance



By Colin G. Trass and Lowell S. Bensky

general approaches to fault tolerance: One minimizes the occurence of a failure, through redundancy of equipment; the other restores system status after a failure, using software control systems, logging of events, checkpoints, data base backups and so on. Restoration of system status is still the predominant method for recovering from software failures — for example, logical data base damage or vendor-supplied software with logic errors.

Generally speaking, a fault-tolerance analysis of a system should take into account nine areas:

The End User

Whether the end user is a person, a robot or data acquisition equipment, fault-tolerant approaches should focus on preventing bad data from getting into the system through edits and tests on input data. The approach should use a simple user dialogue that minimizes decisions and choices and has error messages that are easy to understand. The system should also provide on-line tutorial and help facilities to augment online applications, as well as a tracking and control system that measures quality of service — availability, response time and error rates.

Local Equipment

Local equipment can range from a simple terminal to programmed computing equipment. After a failure, a terminal should present enough diagnostic information to the user to permit him or a person responsible for a particular network component to take corrective action.

The issue is more complicated if programmed computing equipment is used. Designers sometimes specify such stand-alone equipment to improve reliability by isolating some tasks from the central computing facility and communications network. However, this stand-alone computing facility will have many of the same fault-prone components that a central facility has, but because of its limited resources, it may be less effective than a central facility in recovering from a fault.

Fault-tolerant approaches should include one or more of the following:

- Redundant equipment, for example, allowing a user to access the system through nearby terminals.
- A backup communications path.
- Sufficient local software and hardware logic to catch information errors before they enter the main applications systems.
- The ability to monitor, display and recover from most local errors in the hardware, transaction and data management system.
- Facilities to inspect, diagnose and recover information from the central site (for difficult problems).

Communications

Communications and message transport facilities are particularly complex to design and operate because of the many interconnected (often serially) components from different vendors. In addition, the quality of data links from common carriers depends on the age and location of switching equipment. Given this environment, the assumption is that errors *will* occur and fault tolerance is achieved by error detection and retry, alternate routes and redundant equipment.

Some modern network architectures provide embedded error detection and correction at the physical and logical levels — for example, cyclic redundancy checking, sequence checking, layered protocol disciplines and defined responsibilities for recovery. In addition, some companies are now providing network services, including management and control.

Intelligent modems can be used for gathering statistics, dynamic reconfiguration using in-band or out-of-band commands and transmitting diagnostic commands for testing lines and modems by user or central-site personnel. In addition, line testing and analysis equipment provides fault diagnosis and component statistics for specific and predictive problem analysis.

Many sites find it valuable to establish a central control facility that will help users with problems, monitor all communications components and track the progress of repairs. It

THE LOOPHOLE IN

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'Many sites find it valuable to establish a central control facility that will help users with communications problems, monitor all communications components and track the progress of repairs.'

may also prove helpful to measure user availability and response time against prearranged objectives.

Transaction Monitor

As its name implies, this component monitors the delivery of transactions and messages to and from the network and application programs. It also manages resources in support application programs, including error detection and the retention of status information for possible rollback and recovery. This network component is principally software and does not lend itself to redundancy because of complexity and costs.

A fault-tolerant system approach should involve selecting a transaction monitor that can interface with modern network architectures and communicate with other transaction monitors. It should be able to isolate equipment characteristics from program logic in the application and disallow transactions initiated as a result of incorrect input or by unauthorized users. Programmers should be protected from contaminating other coexistent transactions through incorrect programming logic.

Finally, the monitor must interface with a data base management system (DBMS) with supporting checkpoint/restart, logging (dual), backout capability and forward recovery. The monitor should also come with the tools needed to test it in detail before it goes into operation.

Application Programs

Application programs are either built by installation programmers, procured from a software vendor or, more recently, dynamically generated by interpretive systems. This last approach has the potential for creating reliable application programs through extensive cross-checking as the user enters instructions.

A good rule of thumb is that equal attention and program logic design effort should be applied to robustness, user-friendly dialogues and application logic. More effort needs to be devoted to reliability and user interfaces.

A sound approach to fault tolerance in this area includes the use of high-level languages or interpretive systems to build application programs. Alternatively, procure the software from software houses that have a good track record.

Have the application system design reviewed by an independent group. Ensure that installation standards related to reliability are applied, for example, in edits and naming conventions.

Use a data dictionary to keep track of all the data items and relationships, together with edit logic, and establish a rigorous testing environment with the necessary tools in place for programmers.

Select a transaction monitor with a proven track record that simplifies the application environment related to reliability; for example, isolate recovery checkpoint and rollback from the programmer.

Data Management

Many on-line transaction systems now employ a DBMS to simplify data access and control. As more and more reliance is placed on information in a data base, its value increases significantly; thus, maintaining integrity and reliability is of utmost importance.

This software system is one of the most critical elements of an on-line system, so evaluation of prospective DBMS should be rigorous.

The DBMS should have the fol-

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lowing key elements related to fault tolerance:

- Logging (optionally dual) of data base activities, before and after images.
- Automatic rollback in conjunction with a transaction monitor.
- Checkpoint of critical tables and memory areas.
- Image copy of data bases, without disrupting on-line service, with forward recovery procedures using accumulated log-tape activity.
- The ability to recover, without loss of data or integrity, from a failure in the operating system, data base manager or transaction manager.
- A control system that keeps track of image copies, log tapes and checkpoints and that assists in the recovery process.

File Management

File management is a key software building block of DBMS and is the bridge between the peripherals and memory buffers in the processor. While the main purpose is to transfer records using a variety of access methods (sequential, keyed and random), another significant role is error detection and recovery at the hardware interface level. For instance, a data check that was made because of disk surface contamination is potentially recoverable (if it is a single-bit error) or, alternatively, multiple re-tries may effect recovery. If all else fails, the disk track that includes the data can be reassigned to a spare track.

Make sure that the environmental conditions are optimized and consistent. Regularly review error statistics provided by the file manager and operating system and seek appropriate vendor action.

Regularly validate the disk file and perform integrity tests on critical files via vendor-supplied utilities. Mirror image critical files where other recovery techniques are difficult.

In general, it is wise to avoid developing file managers in-house — use unmodified vendor-supplied software.

Operating System

Operating systems are intertwined with hardware in a continuing effort to optimize performance and reliability through hardware assistance. This necessitates using an operating system supplied by the same vendor as the hardware. Since a primary purpose of the operating system is to manage the resources (inboard and outboard), duplication and redundancy are not so easy to attain. Fault-tolerant approaches include the following:

- Keep the vendor-supplied operating system up-to-date, but do not go as far as beta testing.
- Do not modify the operating system under any circumstances.
- Rigorously test a new version before commissioning for production — keep the old version, just in case.
- Maintain a high level of operator proficiency through ongoing training in conjunction with system programmers.

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Hardware and Environment

Even with the strides in fault avoidance through improved component reliability, hardware systems still fail — often at the most inopportune times. Fault-tolerant hardware uses various levels of redundant equipment (processors, channels, controllers, disks and so on) to achieve some level of continued operation. The level of continued operation can be characterized by the time needed to switch over from main to standby equipment after a fault is detected.

Computer redundancy ranges from full duplication on down. At the extreme, the redundant computer shadows the main computer, performing the same tasks simultaneously. This "hot standby" can pick up immediately, within milliseconds, when it is told that the main computer has malfunctioned. A typical application might be a travel reservation system.

Alternatively, the redundant computer can be assigned lower priority tasks that are suspended when the main computer has been found to have malfunctioned. In this case, referred to as "cold standby," the redundant computer must pick up the main application program and be connected to the appropriate disk files and peripherals. This reassignment of load may take seconds, with electronic switching, or minutes, with manual switching.

A variation of cold standby apportions the application among several computers. Each computer has spare capacity. Should one fail, its load can be reallocated among the remaining computers. Of course, system throughput may be slower after such a reallocation of load.

Some form of error detection must be provided to initiate the switch to a backup or redundant computer, as described previously. A software approach to error detection, called checkpointing by Tandem Computers, Inc. of Cupertino, Calif., periodically has one computer announcing that it is "alive" to another computer. In this approach, if the second computer does not receive the message within the prescribed interval, it assumes that the first computer has malfunctioned. Fallback operation is initiated: Data generated since the last checkpoint, and therefore suspect, is cleaned up, salvaged or recomputed, and the system computing load is reallocated among the operating computers.

The hardware approach to error detection has two identical computers running the same tasks synchronously and comparing outputs continuously. Whenever the outputs of this pair do not agree, fallback operation is initiated. This approach maintains data integrity in the face of single failures and prevents incorrect data from reaching the system bus or the disk drives. (Note the difference between error detection by computer pairs and fallback using "hot standby." If both are used, there will be at least two pairs of computers.)

> *'Computer redundancy ranges from full duplication on down. At the extreme, the redundant computer shadows the main computer, performing the same tasks simultaneously.'*

Another hardware error-detection scheme depends on the the use of error-detection and correction codes. These are used with semiconductor main memory and in storing data in disk files. Again, a single error is corrected and will not corrupt processing.

At least five companies have joined or are about to join Tandem in

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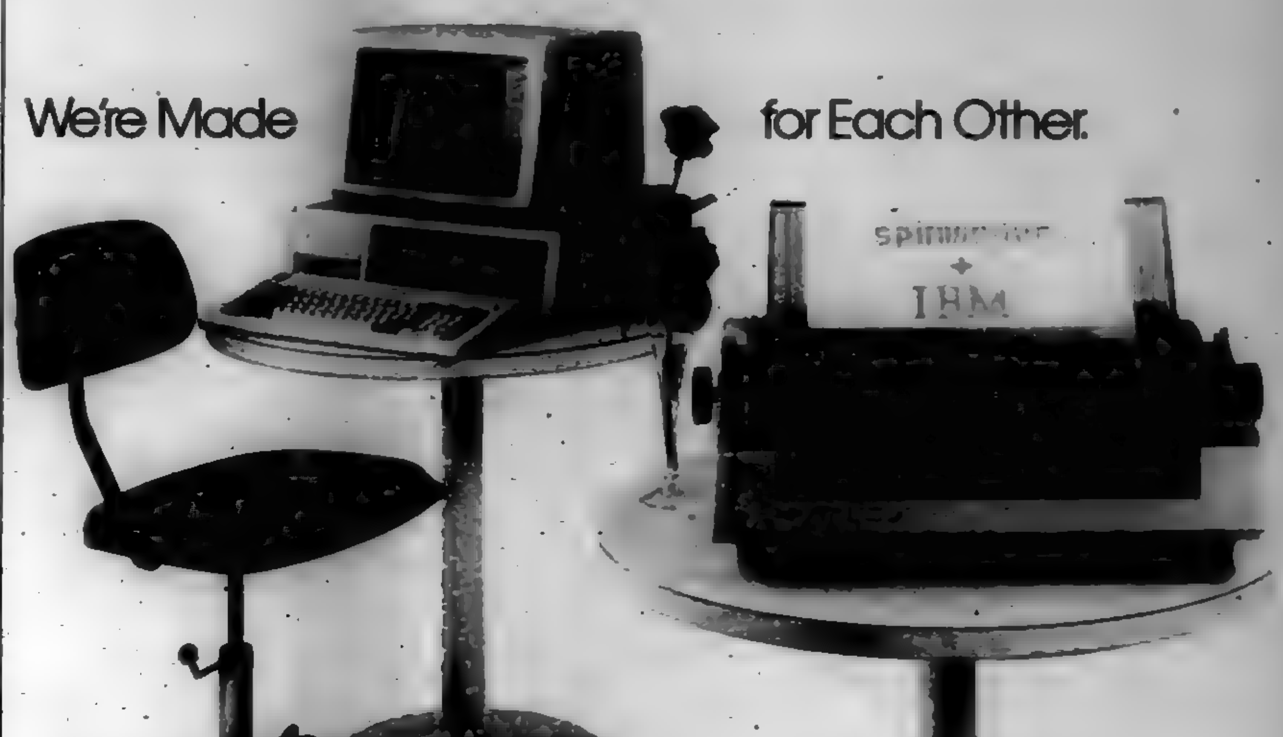

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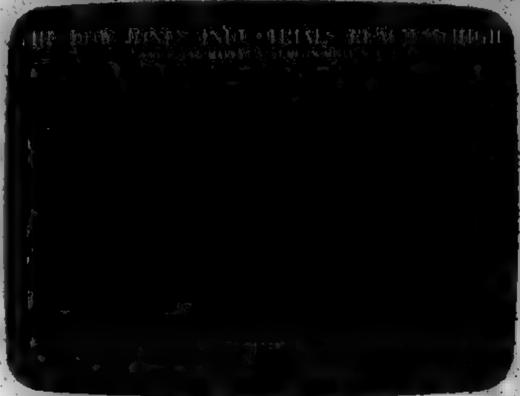

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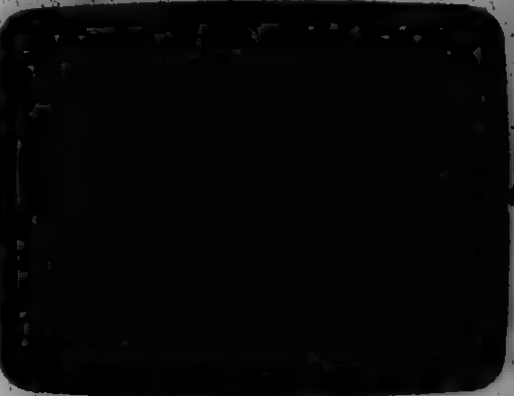

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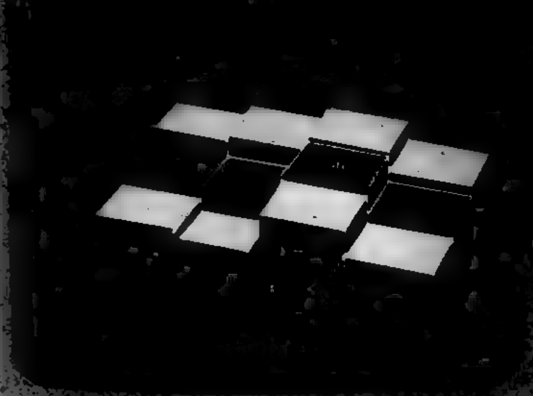

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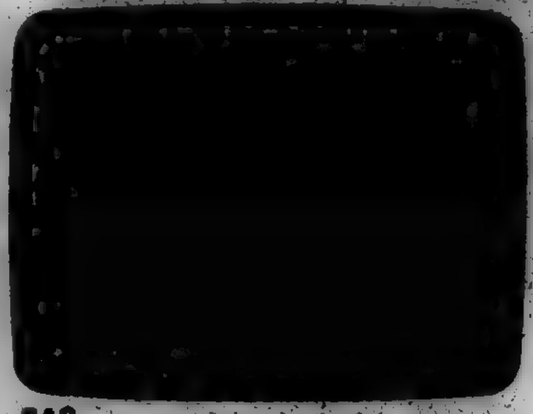

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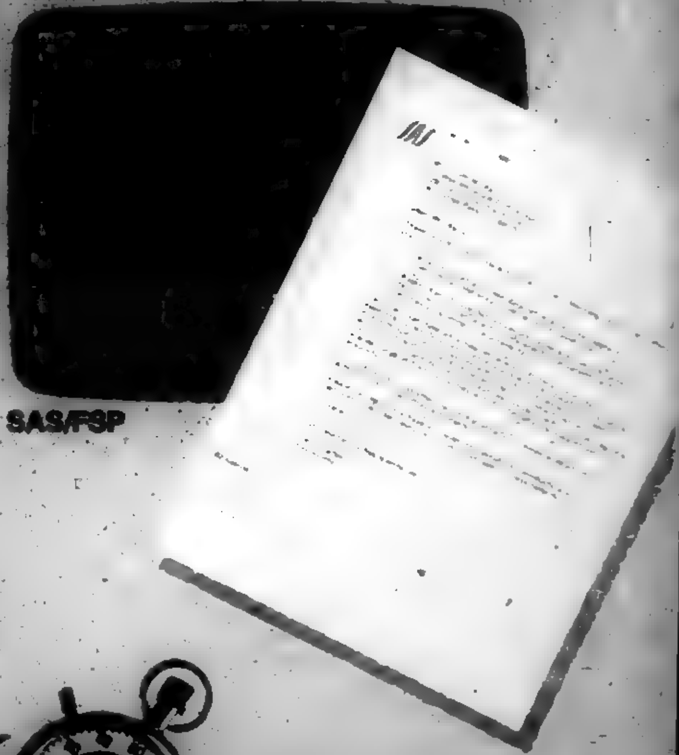

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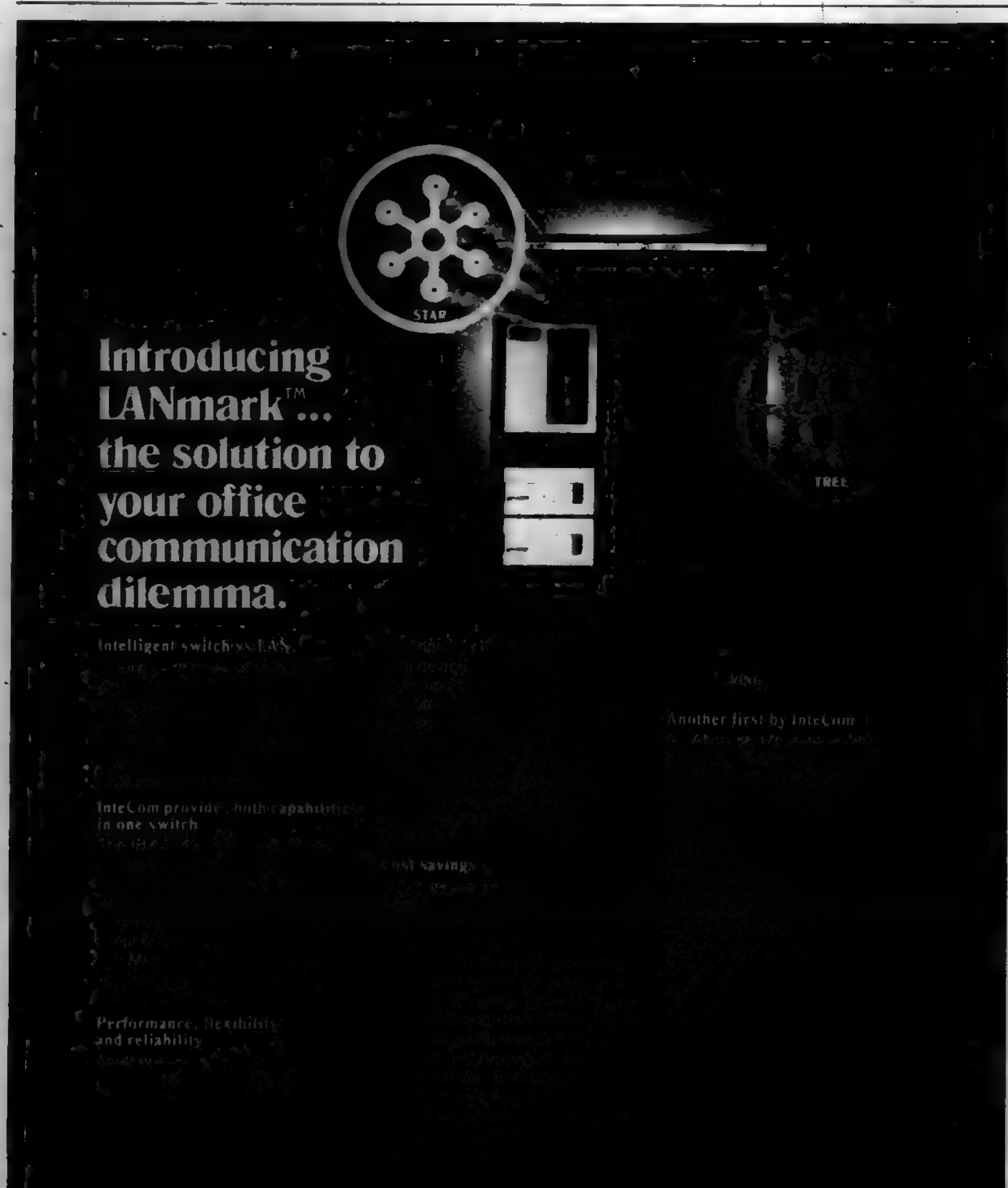
offering fault-tolerant systems for use primarily in on-line transaction applications. Information is available on products recently introduced by Stratus Computer, Inc. of Natick, Mass., and Synapse Computer Corp. of Milpitas, Calif. These three companies have taken different approaches to fault tolerance and transaction processing.

Tandem, which started selling Non-Stop computer systems in 1977, today has an annual shipment volume of about $300 million. The basic unit of its system is a processor module that uses a computer of Tandem's own design. Each module may have up to 8M bytes of main memory and a system may have up to 16 processor modules.



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Stratus Computer shipped its first Stratus/32 early last year. The basic unit of the system is a processing module that uses standard microprocessors (Motorola, Inc. MC68000). The hardware circuits within each processing module are duplicated, with each half continuously checking the other. A mismatch sends an error signal to the operating system and disconnects this processing module so that it may be repaired.

Up to 32 processing modules are permitted on the dual communication bus, called Strata-Link and the data rate on this bus is 2.8M byte/sec.

Each processing module may have up to 8M bytes of main memory. Pairs of processing modules may be duplexed and thus supply continuous processing by having two independent computer systems operating in parallel. If failure is detected in one of the processing modules, the other continues processing without interruption.

Synapse Computer employs a novel architecture which, it claims, continuously levels the transaction processing load. The system has a central shared main memory of up to 16M bytes serving up to 28 general-purpose processors via a dual internal bus with a data rate of 64M byte/sec. I/O processors also hang on this internal bus and service dual-ported controllers for disk storage and other peripherals. If N general-purpose processors are required in a given application, N+1 processors are configured into the system. Loss of any one general-purpose processor means the load is shared by the remaining processors.

While Tandem takes a software approach to error detection and Non-Stop computing, Stratus relies primarily on hardware redundancy for error detection and continuous processing. Syn-

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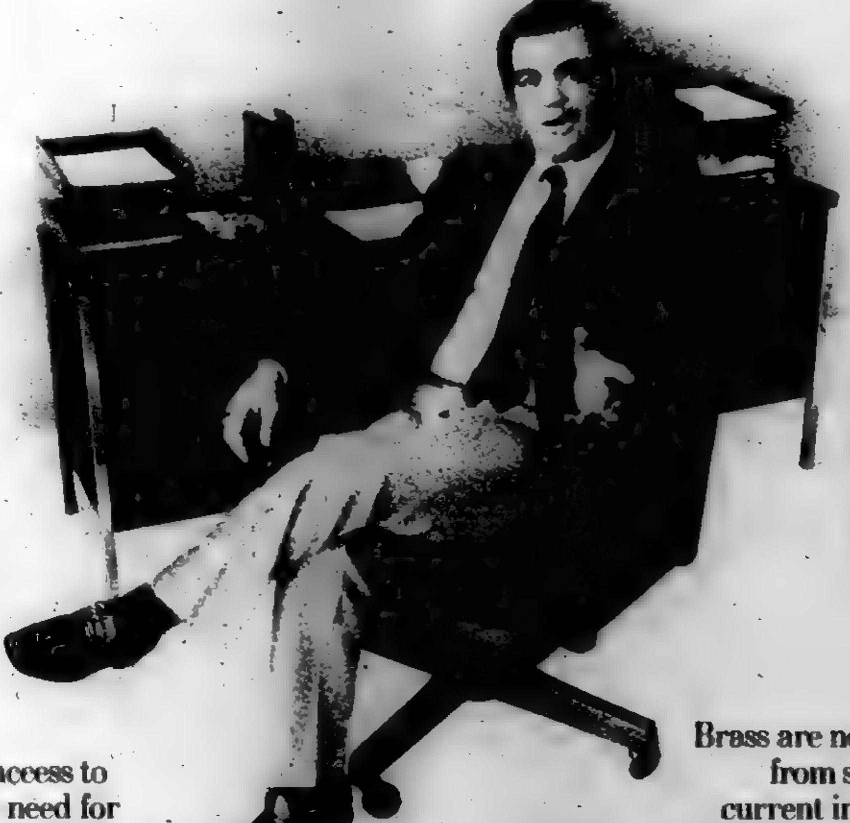

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SQL lets U.S. Brass people extract items from the company's operating data base using any desired selection criteria. They can organize the items into any convenient sequence and format or structure.

One result, Whatley says, was the near-elimination of the backlog of one-time and "on-request" projects that once took 70 percent of the company's programming resources. And turnaround time for the users was cut from days to a few minutes.

"SQL has improved our reputation throughout the company," Whatley adds. "We use it all day long. It has eliminated 80 percent of the unplanned programming requests that were coming to us."

With a bit of tutoring at the terminal, manufacturing, marketing, and customer service professionals at U.S. Brass are now deriving vital information from sales history, open-order files, current inventory and the like. Instead of printed reports of hundreds or thousands of pages, these users are interacting with the data base through SQL to extract and condense exactly the current data they need.

SQL, which runs under DOS/VSE, is available at U.S. Brass on an IBM 4341. Along with end users, SQL also serves the company's professional programmers, who use it to apply the power of relational technology to production programs as well as on-request projects.

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City__________________State__________Zip________ apse has described its approach as one that uses a novel architecture to yield continuous processing without hardware duplication.

The external power source is also susceptible to failure, and the following methods are used to provide backup or warning to effect orderly shutdown:

- Battery bank, providing several minutes of full supply for short outages or for an orderly shutdown, which will permit a fast warm-start upon power restoration.
- Dual power supplies within the system with a means of providing switch-over without disruption.
- Storage power supply with several milliseconds of notification for shutdown sequences. Generally, this is insufficient to close down a transaction monitor and data base system.
- Motor generator for a full alternate power source.

An Availability Scenario

When management information systems management reports on "quality of service" to users, frequently only the critical components are considered — the transaction monitor, the operating system and the central hardware. Focusing on these three high-visibility elements, a combined "system availability" objective as high as 98% is often set. However, the user may see only 80% to 90% "total user availability" in actual practice, and he might rightfully complain. By ignoring six of the nine elements described previously, "system availability" encourages poor system design. "Total user availability," which takes into account all nine elements of a complete system design, should be used to predict and report availability.

The chart above illustrates the components of a typical on-line transaction system. The lower bound and typical availability percentages are given for each component. The overall availability is derived from components in series:

$$\text{Availability} = A_1 \times A_2 \; . \; . \; . \; .$$

	AVAILABILITY Lower Bound %	AVAILABILITY Typical Actual%
User	97.0	100.0
Terminal	99.0	99.7
Communication Link	95.0	99.7
Transaction Monitor	98.0	99.0
Application Program	99.0	99.5
Data Base	99.0	99.5
File Manager	99.5	99.8
Operating System	99.0	99.5
Hardware and Environment		
Single Processor	98.0	99.0
Dual Processor	99.2	99.5
Total User Availability		
Single	84.6	95.7
Dual	85.6	96.2
System Availability*	95.0	97.5

(*) Includes only transaction monitor, operating system, hardware (single)

Availability of Components in Typical On-Line System

Note that in this example, duplicating hardware has a limited impact on total user availability.

This availability scenario suggests the following approach:

- First, select and configure the hardware and software systems to achieve the required level of total user availability. Obtain reliability data from the vendor, from other users of the systems and from experience.
- Second, strive for corrective action before users are affected, through early-warning trend analysis and reporting systems in order to minimize surprises.

Future Directions

The task of building a fault-tolerant system under a given set of application requirements is a major system design problem that requires a total systems approach with which few users are familiar.

Successful vendors are likely to be those who provide tools and procedures to lighten or partially remove this system design burden from the users' shoulders. In addition to better hardware and software tools, users will find standardized analysis techniques for achieving the desired level of system fault tolerance.

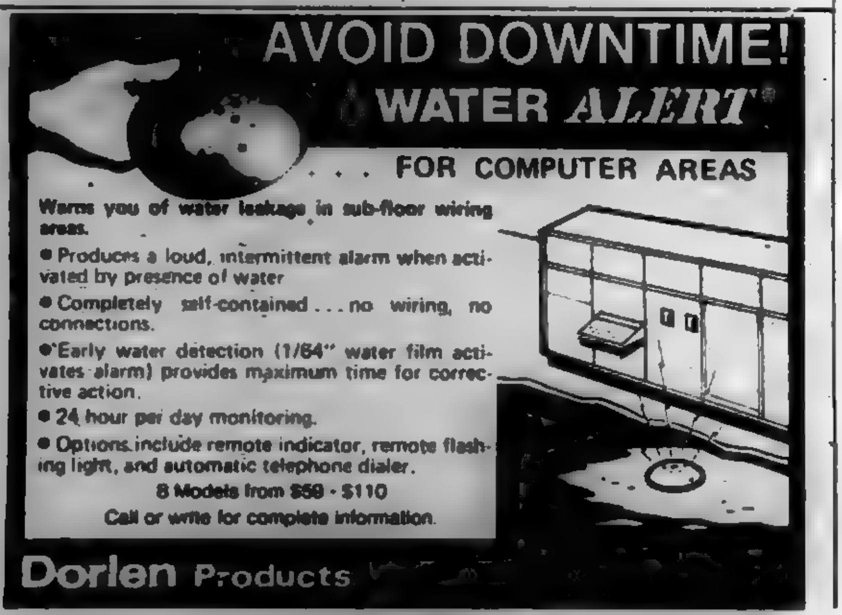
Fault tolerance is not required in every computer application. Where it is required, however, it is often critical. And, since fault tolerance comes at the expense of some loss in performance or increase in cost, there will be attempts to minimize this expense. With hardware costs projected to continue their downward trend and software labor costs continuing to increase, fault-tolerant systems will depend more heavily on hardware techniques to implement fault detection, redundancy and load leveling.

In addition to Tandem and the more recent fault-tolerant systems suppliers, the major computer manufacturers including IBM, Digital Equipment Corp. and Hewlett-Packard Co. are monitoring this special segment of the computer market. Preliminary announcements indicate they will offer special hardware options, software and configurations aimed at fault-tolerant, on-line transaction processing.

About the Authors

Colin G. Trass is a senior consultant on the staff at Arthur D. Little, Inc. in Cambridge, Mass. He is active in the areas of large on-line communications networks, data base systems and operating systems for manufacturing and banking applications.

Lowell S. Bensky is also a senior consultant at Arthur D. Little, where his interests are product strategy and systems architecture.



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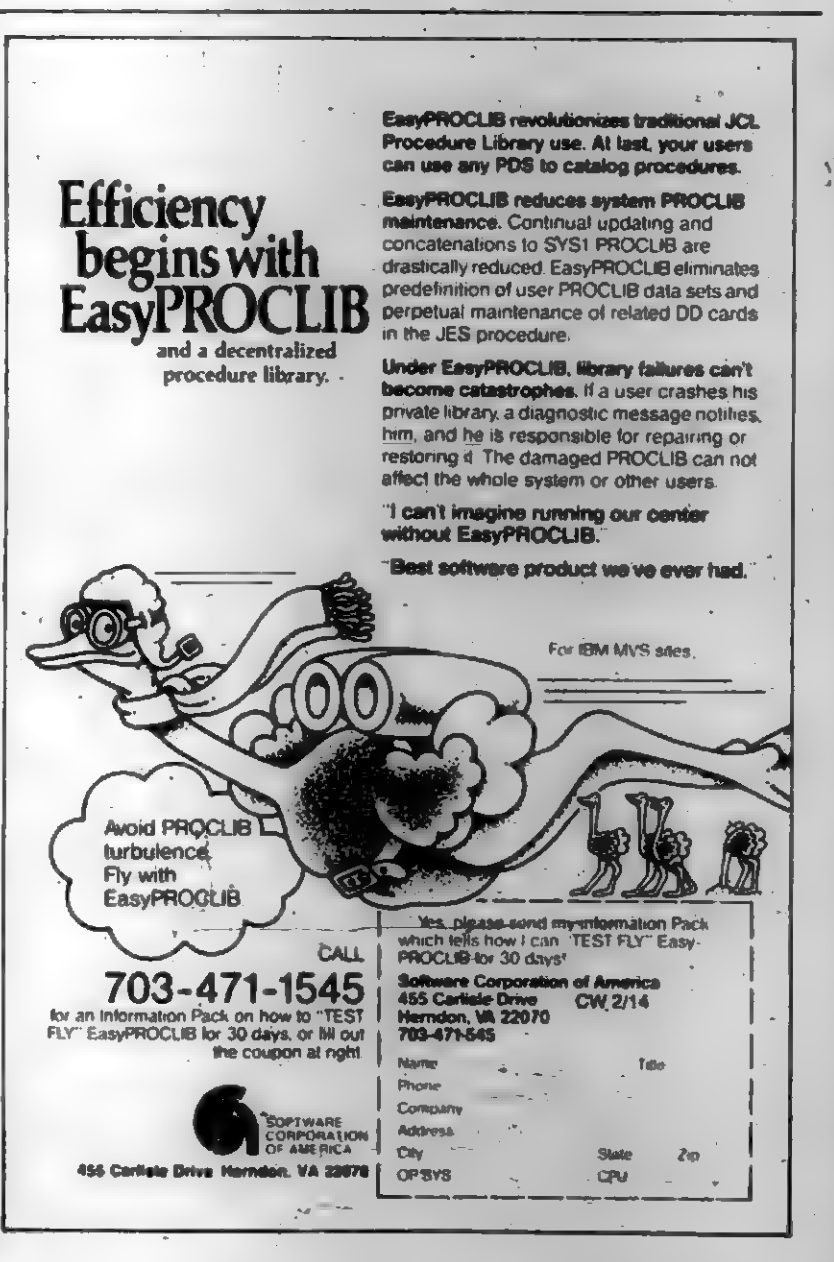

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Putting Your Data On the Line

Know the Risks Before You Sign A Service Bureau Contract

A major financially oriented company recently spent several million dollars to purchase its own hardware and develop its own software for in-house computer applications. The company had been using an outside service bureau to process its daily transactions and most of its necessary automated business functions. One of the reasons for converting to the in-house system was to save the substantial monthly service bureau fees.

Before converting from the service bureau to this in-house function, the company contacted the service bureau and requested a magnetic tape of all the company's master files. The service bureau refused to release the master file tapes without payment of an exorbitant termination "ransom" fee.

The company then faced the unpalatable choice of paying the service bureau's master file fee or attempting a manual data conversion. Another alternative was to file a lawsuit for an order directing the service bureau to re-

By Richard Raysman

lease the master file information in readable magnetic form. (Courts have enforced such user rights in lawsuits.)

This user's experience is not unusual. When a major user of a service bureau decides, for any reason, to terminate its relationship with the service bureau, the service bureau may be reluctant to lose that important client without payment of a substantial termination fee.

Consequently, the user of service bureau functions should have a comprehensive written agreement that defines the various rights and obligations of the user and the service bureau. A good written agreement also benefits a service bureau in that it prevents future misunderstandings with respect to price, payment and limitation of liability.

Business Vulnerability

A user must understand its vulnerability and business risks when it decides to use a service bureau. The user frequently places one or more major functions of its business under the control of an independent third party. For example, a user may have a service bureau create its invoices, keep its accounts receivable and maintain its inventory records. In the event that the service bureau is either incapable of performing or refuses to perform, the user can be out of business. If the user has regulatory obligations, as do banks or pension funds, it could also be in civil or criminal violation of federal or state laws if the service bureau fails to perform.

From the user's viewpoint, there should be no misunderstanding about ownership of the user's data base. If a dispute arises, the user will want possession of its data base so that it can continue to receive processing services from another source or use in-house processing while resolving the dispute.

A contract provision clearly granting all aspects of data ownership to the user can help prevent this type of situation. The provision should state that all ownership of the data resides with the user, that the service bureau will deliver all data to the user upon the user's request and that the service bureau possesses no lien or other such rights to the data records.

Another key clause should provide that the service bureau deliver periodically to the user, perhaps once a

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week or once a month, a copy of all of the user's updated master files, in magnetic tape form. Then, if the user decides to terminate the contract, it will at least have a relatively current version of its master files in case the service bureau refuses to cooperate.

Rights to software. The software used to process the user's data is almost always the property of the service bureau. The same software is often used to perform similar functions for different users, and much of the service bureau's basic software can be used for all of its clients.

Under normal circumstances, the user has no need for the software, since the service bureau performs all the processing. However, if the service bureau defaults in performance, changes ownership or files for bankruptcy, the user may need access to the software in order to continue its automated operations.

Accordingly, the contract should provide that under certain described conditions, the user will be granted a license individually to use the software. Of course, the user will still have to get its own equipment to run the licensed software.

Furthermore, the contract may provide that up-to-date tapes of the service bureau's software be delivered periodically by the service bureau, to be held in escrow or a similar safekeeping arrangement. This provision ensures that, in the event the user needs to use the software on its own, such software will be physically available. In addition, the contract may provide for periodic testing of the tapes to verify their accuracy and completeness.

Pricing agreement. As in any contract, pricing is a key element in a service bureau agreement. Both user and vendor should be certain that the pricing understanding is clearly defined.

Generally, there is a two-part pricing schedule including an equipment rental fee and processing fee by transaction schedule. The equipment rental can be for hardware located on the user's premises as well as for hardware devoted exclusively to the user on the service bureau's premises. The user may have an option to purchase the equipment by applying a percentage of the rental fee to the purchase price.

The processing fee by transaction is a fee for each individual type of transaction. If there is a misunderstanding concerning processing fees, the misunderstanding will affect the heart of the contract and could cause an early termination of the service bureau arrangement. If the user expects a large volume of transactions, it should attempt to negotiate a price change after a certain number of transactions. For example, in a payroll processing service, there may be a certain fee for the first 5,000 employee checks in a month and a reduced fee for all subsequent employee checks.

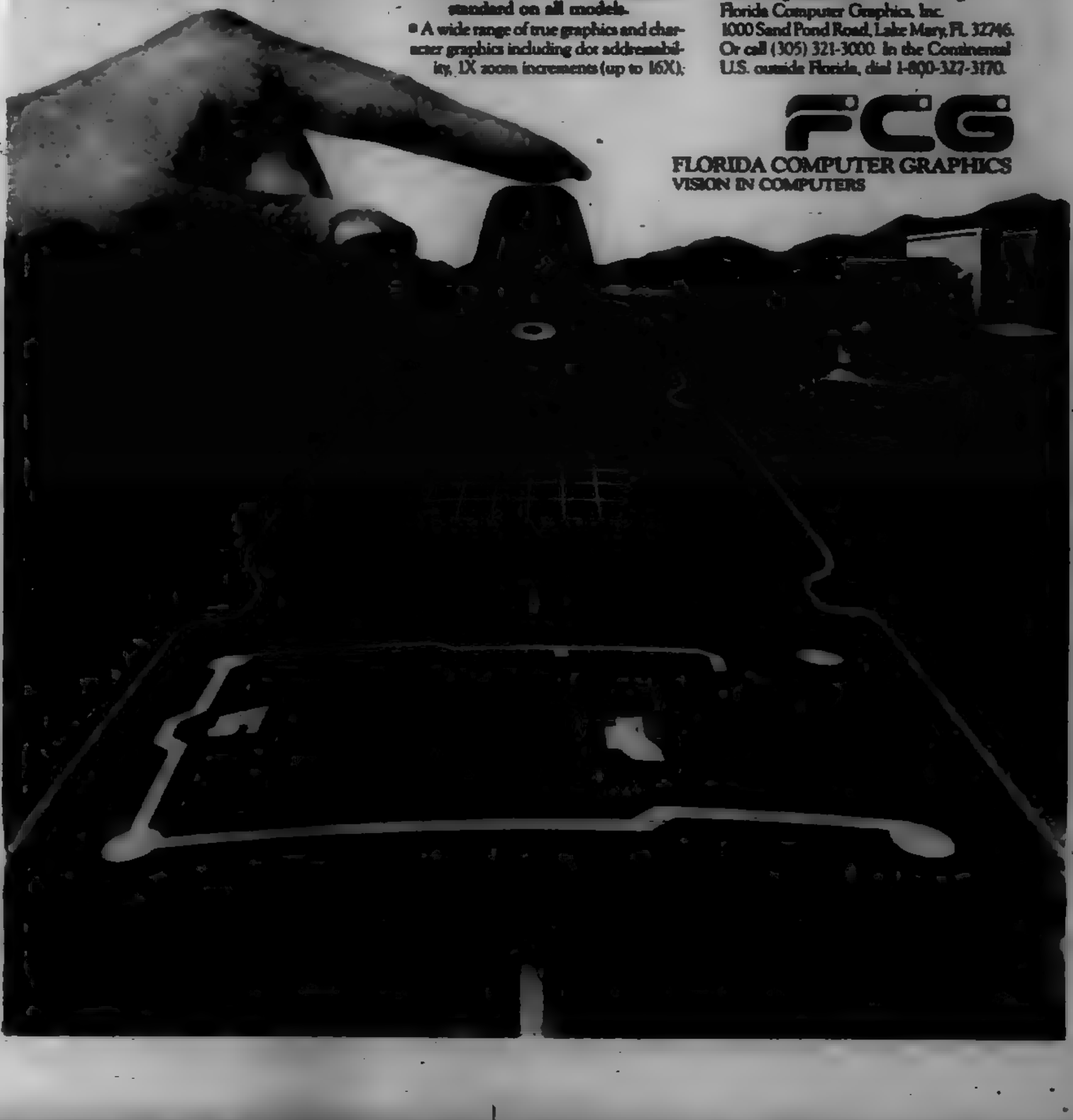
Within the pricing structure, the service bureau may require the user to commit to a minimum equipment rental or a minimum number of transactions during the contract's term. If the service bureau function is not being used as much as originally anticipated, the user will still be obligated to make the minimum payments.

As part of the overall pricing arrangement, the vendor will often include initial set-up charges. This might include part of the expense of acquiring new equipment and the vendor's expense to hire additional employees to service the user. For a major service bureau function, the initial set-up charges can be significant.

Hardware configuration. The hardware configuration recommended by the vendor must be sufficient to meet the user's present and future needs. For example, a user may choose a service bureau because it recommended a configuration with an equipment rental fee of $10,000/mo.

If the configuration proves to be inadequate after installation, the user may have to spend $20,000/mo for the correct configuration. This $120,000 additional expense per year may place the user well above its anticipated budget.

Accordingly, the user should get a commitment from the service bureau that the proposed configuration is adequate to meet the user's needs,



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which include an estimated number of daily transactions.

There should also be a commitment that if the user's transactions increase, the configuration can be upgraded at a reasonable cost. This cost must be defined at the outset, for once the user has elected to use a particular service bureau, the user cannot easily switch.

Terminal response time. Frequently, in a service bureau environment, the user will have data entry terminals on its own premises for interactive data input functions. As in any application with on-line terminals, poor terminal response time can result in system failure. Accordingly, the user should obtain a written commitment from the vendor that the terminal response time will fall within certain parameters.

Response time is often not related to one element, but to a combination of several, such as hardware, software, telephone lines and modems. An unsophisticated user relies on the vendor to ensure that the combination of all the factors will not adversely affect terminal response time. Thus, the user wants a commitment that the system will have an adequate response time regardless of what may be creating the problem.

Software modification. The service bureau's standard software may not meet all of the user's needs and the service bureau may agree to software modifications as part of its responsibilities.

Software modifications sometimes turn out to be the most involved and expensive part of a service bureau agreement. In such cases, a major part of the service bureau agreement concerns various aspects of software development, including specifications of software functions, scheduling of software development, acceptance testing, trial periods and payment schedules.

Often, a service bureau will have several clients in the same industry. If the user has paid a substantial sum on software modification in order to gain a competitive advantage, the user would generally want to restrict the use of the modified software. The user should request exclusive rights for a period of time, so that its competitors do not benefit from additional software for which the user has paid.

Payment. It can be expensive to convert to a new service bureau function. The user should ask for a clause in the contract that clarifies the assistance the service bureau will give during the conversion effort and the costs associated with this and any additional assistance.

From the service bureau's viewpoint, there should be a clear definition of how and when payment is made. The service bureau has regular payroll, monthly hardware leasing payments and other overhead costs, so it needs to be certain that payments are made on time.

Limitation of liability. The service bureau will also want an indemnification provision protecting it from damages caused to third par-

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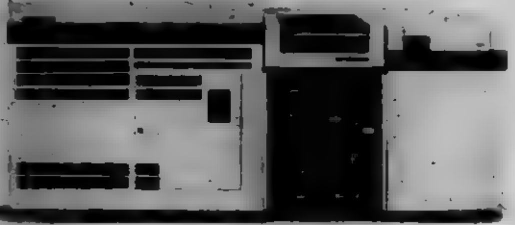
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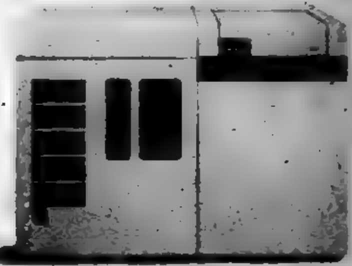
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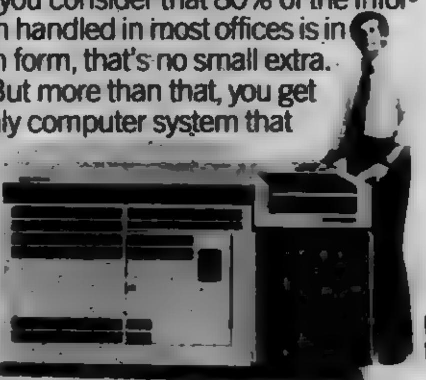
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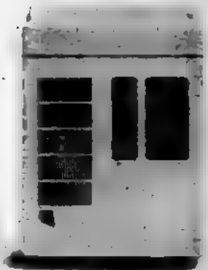
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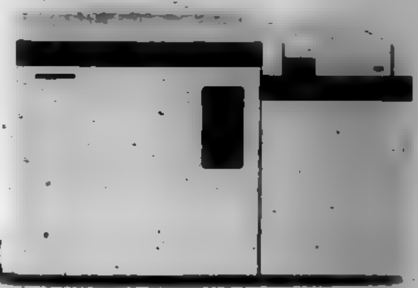
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ties resulting from instructions from the user. For example, a client pension fund may give incorrect instructions to a service bureau for processing certain data.

As a result, members of the pension fund may lose money. In the event of a legal action, the service bureau wants to be certain that it does not have financial liability for following the instructions of the pension fund in good faith.

A service bureau will also want to make an effort to limit its liability in the event of financial loss by the user. If a service bureau receives only $1,000 a month from a client, it does not want to have unlimited liability, which perhaps could run into hundreds of thousands of dollars. Thus, a service bureau will generally want a contract clause that limits its liability for consequential damages.

> ***'A service bureau will also want to make an effort to limit its liability in the event of financial loss by the user. If a service bureau receives $1,000 a month from a client, it does not want unlimited liability, which could run into hundreds of thousands of dollars.'***

Smithsonian vs. Datatron

These contract provisions can be important for preserving the rights of the user and vendor. An example of some service bureau issues was described in the suit, *Smithsonian Institution vs. Datatron Processing, Inc.* [3 CLSR 393 (EDNY, 1971)].

Early in 1970, the Smithsonian Institution decided to publish a new magazine. The Smithsonian then made a service bureau agreement with Datatron, which offered subscription fulfillment services. Datatron agreed to receive, open and sort mail; create and maintain subscriber records; prepare magazine mailing labels; address bills and renewal notices; and prepare and deliver reports to the Smithsonian.

Datatron was obligated to collect all subscriber information and maintain it on a master file that would be updated weekly. The contract also provided that a master file tape would be delivered to the Smithsonian after each label run.

In March 1971, after several months of incomplete and inadequate performance of services by Datatron, the Smithsonian terminated the agreement, claiming that Datatron had breached. Smithsonian shifted its subscription business to another service bureau and requested that Datatron turn over all the updated master files containing subscriber information, so that the new service bureau could prepare mailing labels.

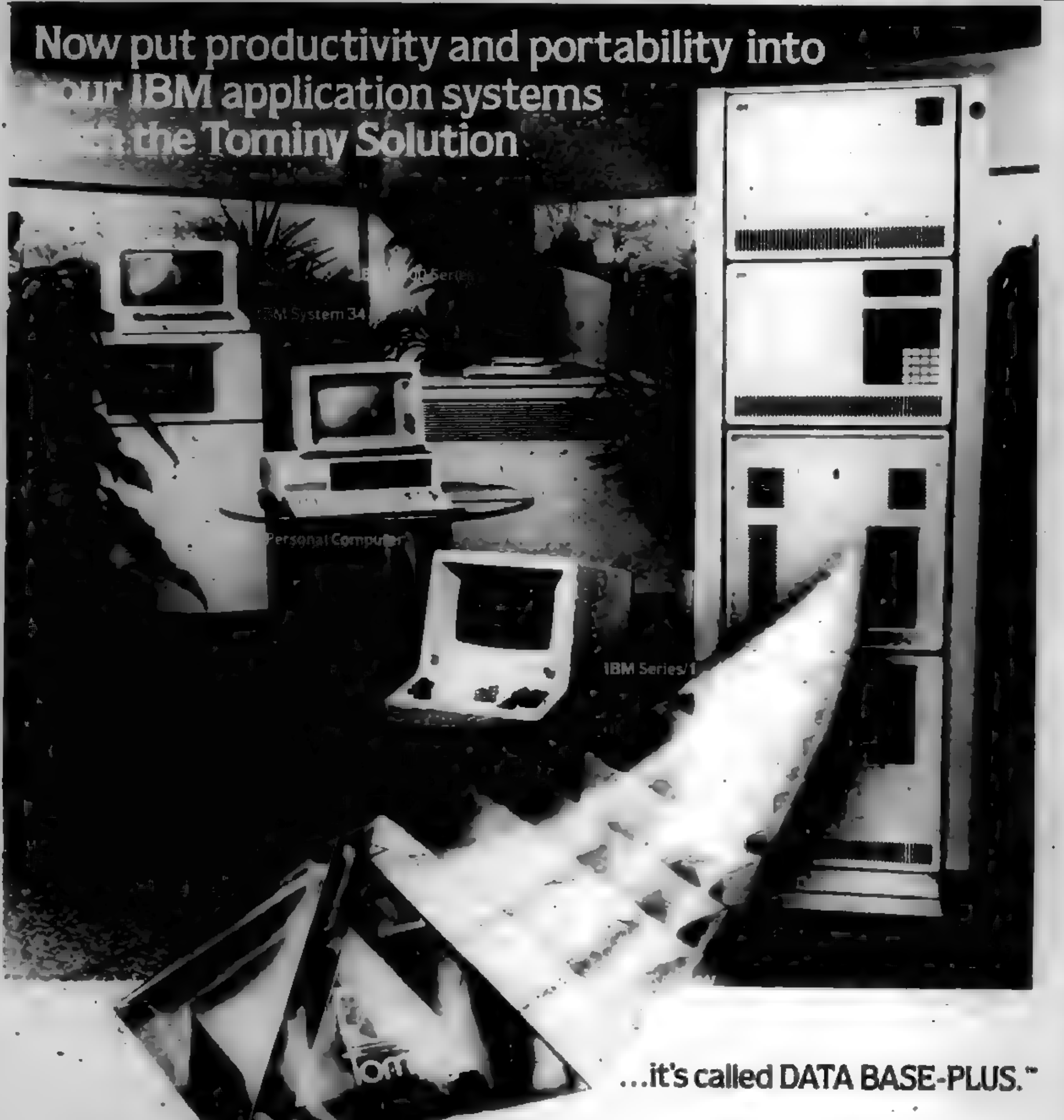
Datatron refused to turn over the master file copies scheduled under the contract. As a result, the Smithsonian filed a lawsuit in the New York Federal District Court requesting a preliminary injunction to compel Datatron to deliver the disputed tapes.

Based on the terms of the service bureau contract, the court granted the requested injunction, ordering Datatron to turn over the appropriate master files to the Smithsonian. By clearly setting forth the Smithsonian's rights to the master file tapes, this contract provision provided a solid basis for granting the preliminary injunction.

About the Author

Richard Raysman is an attorney with the New York City law firm of Brown, Raysman & Millstein. He specializes in contract negotiation, litigation, protection of proprietary information and other areas of law relating to computers.

Raysman is chairman of the New York State Bar Association Computer Law Subcommittee. He has written for the **Harvard Business Review** *and* **The New York Times** *and currently co-authors a monthly column on computer law for the* **New York Law Journal.**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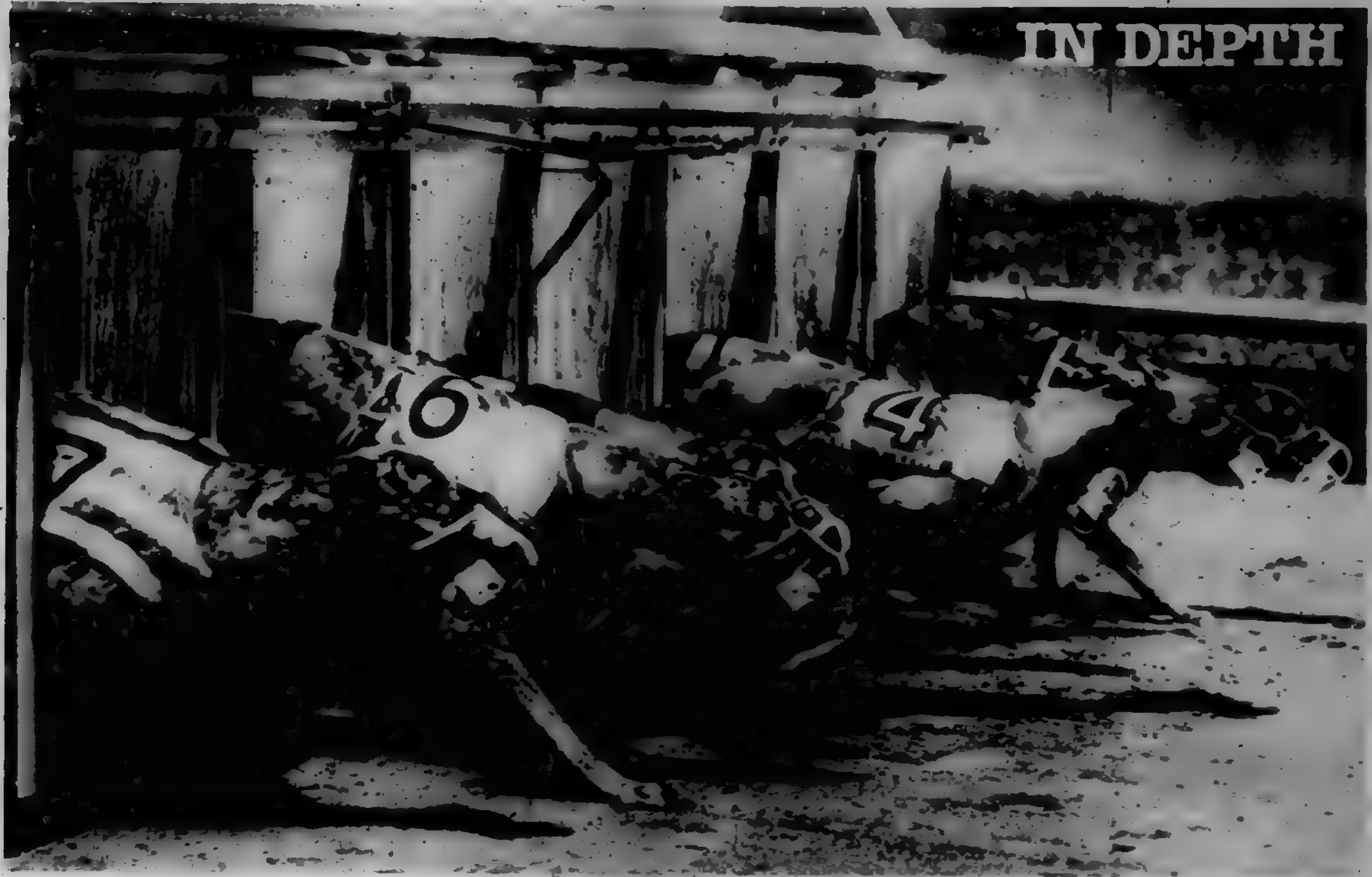

HOW TO PICK A WINNER

A Look at Software Methodologies

By Girish Parikh

Selecting the "right" software methodology may save you a fortune in the long run. Consider these figures: Several studies indicate that maintenance consumes 67% of the software life cycle; the remaining 33% is development. Once a software system becomes operational, it may be used for five to 20 years (some IBM 1401 programs are still around).

Consider the result if a methodology helps you save at least 10% in total life-cycle costs. This savings may result in different ways. For example, depending on the methodology, you may spend more on the front-end development cycle (in the design stage) and save 20% on the subsequent maintenance, including repairs and enhancements.

Keep an open mind when choosing a methodology. Be willing to learn and discover no matter what your position — president or programmer. Remember that a highly promoted or well-known methodology is not necessarily the best.

Professionals should learn more than one methodology, since one may not be suitable for every application. To save on training costs and to standardize, organizations may select one major methodology and use another when an application demands. When possible, methodologies may be judiciously combined. Large companies may have methodology specialists, while small companies might use outside consultants specializing in the appropriate methodology.

Most methodologies can be divided into two major groups: functional and data-structured. With the first type, data flow analyses (for instance,

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data flow diagrams) are ultimately translated into functions.

The major function-oriented methodologies include improved programming technologies (top-down development, structured programming, structured walkthroughs, development support libraries, team operations and Hipo); Thomas DeMarco's structured analysis; Ed Yourdon and Larry Constantine's structured design; and Softech Microsystems, Inc.'s Structured Analysis and Design Technique.

Data-structured methods derive design structure based on the logical structure of data — both input and output. The major data-structured methodologies are Logical Construction of Programs/Logical Construction of Systems, developed by Jean-Dominique Warnier; Data Structured Systems Development (DSSD) of Ken Orr & Associates; and Jackson methodology (developed by Michael Jackson).

Some methodologies have automated tools available. For example, DSSD has Structure(s) for automating the Warnier/Orr diagrams during design and a code generator for outputting Cobol code from detailed program structure charts.

Should you select a methodology that has automated tools? Effective use of appropriate tools would increase programmer productivity substantially. On the other hand, a manual methodology may be more elegant.

Consider the following in making a decision:

- Can the use of tools be extended in the maintenance phase?
- Are the vendor-supplied tools adequately supported?
- Are the tools well-documented and easy to use? Is training available?
- Are the tools cost-effective?
- If a manual methodology is selected, can it be automated in whole or in part at a reasonable cost? If yes, who will automate it — vendor, user or a third party? Make sure there is a definite plan for automating.

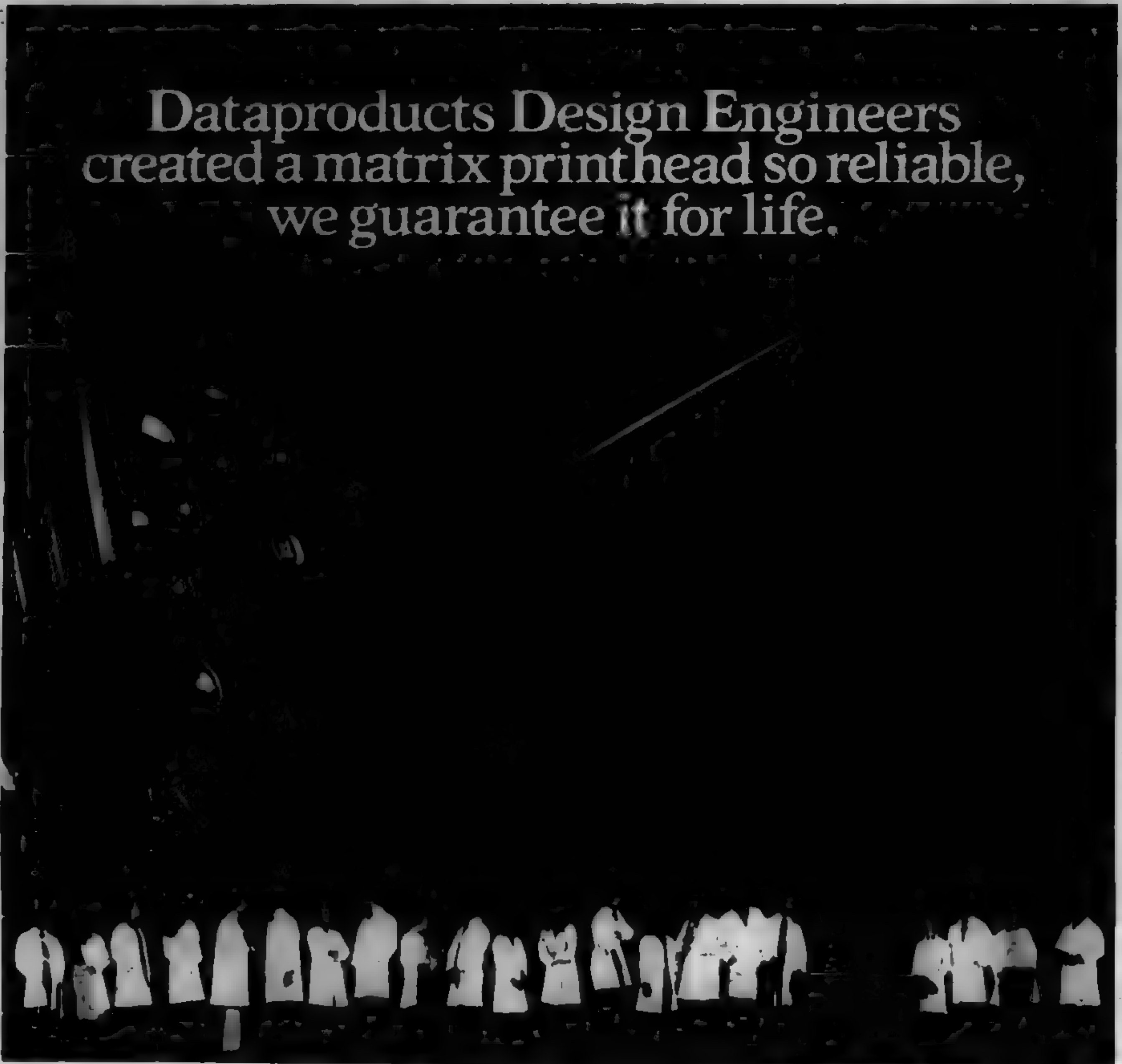
What about data base environments? Third normalized, stable data bases are parts of foundations on which the structure of information engineering is built. However, a methodology for designing program logic is still necessary.

To make the most objective choice possible, test a few candidates (both with and without tools) yourself.

The following discussion is restricted to program development and maintenance, but the same testing process can also be used to evaluate systems analysis and design methods. It can encompass all activities from analysis to system maintenance.

First, select a typical program (2,000 to 3,000 lines of code) from the design of a system currently being developed. The system itself may be designed with any method. The selected program should be noncritical.

If you are not currently developing a system, select a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stand-alone program or an existing unstructured program for rewriting.

Assume you are evaluating four methodologies. Select four programmers with equivalent capability and experience. They should have no knowledge or experience in the method they will be using.

These programmers, designated A, B, C and D, will develop the program. Assign a programmer to learn and use each method.

Using the same criteria, select another four programmers (a, b, c, d) with less experience than the first four. These programmers will serve as backup and will do maintenance when programs are installed.

For each method that has automated tools, select a programmer, using the same rules. In our example, we need a programmer for DSSD and Jackson methodology. Call them programmers a_t and b_t. These programmers will develop the same program using tools. For maintenance with tools, two more programmers, a_{tm} and b_{tm}, will be needed.

Next, assign each programmer to a methodology. Let each one select the method with which he would like to work. (If more than one programmer wants to work on the same method, flip a coin.)

If programmers have selected methods in sequence, the distribution may work out as in the table below.

Thus, we need 12 reliable programmers.

For one week, give each programmer the best training available in his method. If possible, use the same kind of training for each method — for example, classroom video courses.

Select an open-minded person to supervise these programmers. He should get an *overview* training in all the methodologies and should collect management and technical data during the project.

Appoint an independent observer, preferably an outside consultant who is knowledgeable in the methods. Ideally, he should also take all four training courses.

Let programmers A, B, C and D start working on the same program *separately*. Four versions of the program will be developed, using four methodologies. Backup programmers may be called in when the original programmers cannot work further. When not needed, backup programmers may work on other assignments.

Programmers a_t and b_t should develop the same program using tools and the appropriate methodology.

Record progress data on a daily basis. Also, make sure that the methods are followed correctly. A consultant can guide, if necessary. It may even be possible to get help, on a voluntary basis, from the original developers of the methods.

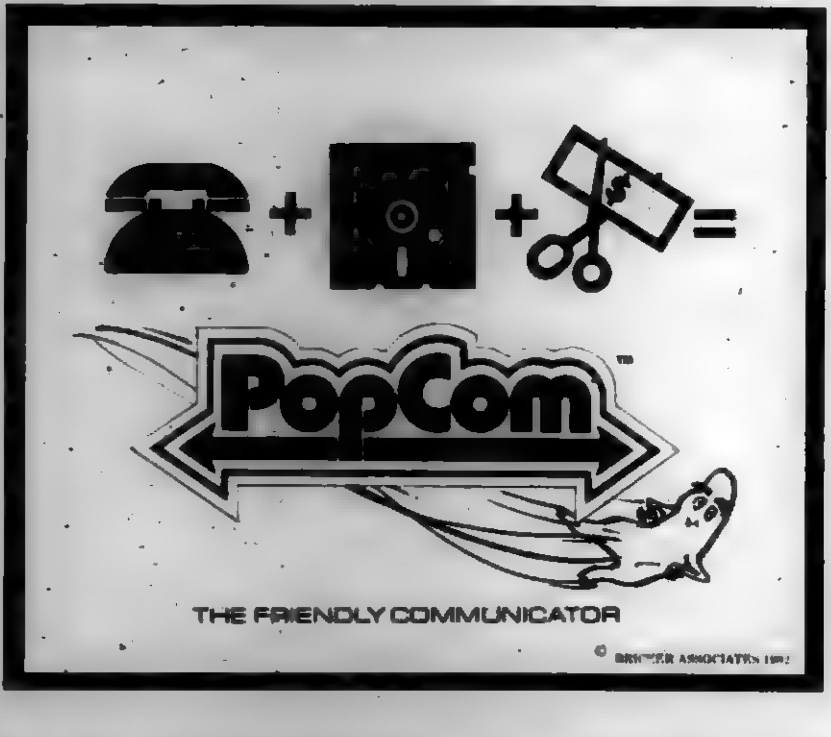
Determine which data is to be collected and develop forms before the project starts. During the project, these forms may be modified, if necessary.

Examples of data that can be recorded are:

- Time spent on different activities, such as program design, coding, testing and documenting.
- Daily progress, including progress in design, coded lines, tested lines and so on.
- Number of test runs and errors found after walk-throughs (if walk-throughs were conducted).
- Use of automated tools and programming aids.
- Other help used and time spent during such help.
- Program completion date (when

	Programmers			
	Development		**Maintenance Modifications**	
Method	**Manual Version**	**Tools-Based Version**	**Manual Version**	**Tools-Based Version**
DSSD	A	a_t	a	a_{tm}
Jackson Methodology	B	b_t	b	b_{tm}
LCP	C		c	
Yourdon/ Constantine Methodology	D		d	

Sample Methods and Programmer Assignments



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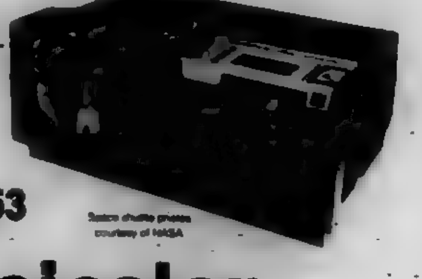
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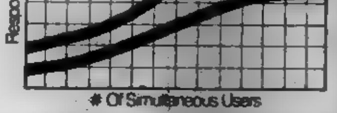

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Other Offices: New York, Houston, Dallas, Los Angeles, San Francisco, Chicago, Washington, D.C., Morristown, NJ, Stamford, CT/Representatives: Australia, Japan, Canada, Italy, Saudi Arabia a program goes into production).

- Any other pertinent data.

The real race begins when the programs go into production. Of course, the performance of the winner during development should be considered when selecting a methodology; however, the long, expensive maintenance cycle will probably decide the race. Let all programs be completed before beginning the maintenance race.

Next, change the programmers' assignments. Let a, b, c and d take over the maintenance of each manual version of the program and a_{tm} and b_{tm} take over the tool-based version. As we saw earlier, a, b, c, d, a_{tm} and b_{tm} served as backup programmers for programmers A, B, C, D, a_t and b_t.

If any of the backup programmers had to work during development, he already knows the program and has an advantage. However, when he worked in development, there must have been some time elapsed in communicating — which may offset the advantage.

During maintenance, A, B, C, D, a_t and b_t are given other assignments; however, they should be available as backup programmers for maintenance.

If at any time backups are needed, deduct some points for that program, since the backup programmer already knows that program.

Give the same maintenance and modification assignment to each programmer.

Record the kinds of maintenance handled. The major classifications may be corrective (to correct problems), adaptive (to adapt to changing environment, such as operating system or hardware) and perfective (to take care of changing user requirements).

Record such data as quality of work, time taken and so on. Especially note the condition of documentation. It *must* be updated as the maintenance work is done.

The race may continue for one year after the programs go into production. Note that not all programmer time will be spent on maintenance during that period. If an existing program was redeveloped, maintenance may continue on the old program, to estimate savings resulting from redevelopment. However, the old program might have changed while the new versions of the program were being developed.

After the one-year maintenance race is completed, analyze the data. Rank the methodologies. Then, continue to use the highest ranking program. The program ranking second may be used as backup.

But how does one justify the cost of such a project? It will probably only be a front-end cost. Assuming the life of the program is 10 years and the best method saves at least 10% annually on maintenance, imagine the savings over a period of nine years. And the program may last longer than that, especially when it is maintainable and well-documented.

But what if the highest ranking method is the one you might have selected anyway? This method confirms your choice.

In addition, you will also know the second best method and will have programmers who are trained and experienced in other methods, just in case.

The project may be repeated with different kinds of applications and environments.

Such projects may be conducted periodically, perhaps after a couple of years, but especially when the time comes to rewrite a system.

The method can be extended to include systems analysis and design methodologies. Some methods can be used in the entire software life cycle.

About the Author

Girish Parikh is a Chicago-based consultant, lecturer and author. He is the author/editor of How to Measure Programmer Productivity, *"Programmer Productivity Reports" (both published by Shetal Enterprises, Chicago),* Techniques of Program and System Maintenance *(published by Little, Brown and Co.) and* Tutorial on Software Maintenance (with Nicholas Zvegintzov, published by IEEE Computer Society Press).‡

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Choices Many, Definitive Solutions Few

Net Architecture Options Seen Confusing

By Jim Bartimo
CW Staff

NEW ORLEANS — "We're going to get good at building communications systems one way or the other." But until that time, UCLA Computer Science Prof. Leonard Kleinrock said recently, confusion will remain about which network architecture is ideal.

Networking choices are many, but definitive solutions are few, Kleinrock told a session at the Communication Networks Conference & Exposition (Comnet '83).

On the local-area network side of the issue, Kleinrock pointed to two sets of problems: those facing the scientists who develop various technologies and those facing the users of the technologies.

Scientists are concerned with speed, capacity, response time, efficiency, channel access, addressing and other technical aspects of the local-area network, Kleinrock noted, but users have more basic problems. They want to know about cost, reliability, ease of installation, expansion capability, standards, protocol interfaces and security issues.

Kleinrock reviewed the major local-area network architectures available — ring, star and bus — and the methods by which messages are successfully transmitted (for example, token passing and carrier sense multiple-access with collision detect). Each technology has its own set of advantages and disadvantage, he said.

"Which is best?" Kleinrock asked rhetorically. "The scientists say they don't know yet."

CW Photo by J. Bartimo

Prof. Leonard Kleinrock

Kleinrock maintained that no one in the industry has the answers to all the networking problems, not even to the question of which method should be used to connect terminals in a local-area network. Among these methods are twisted-pair wire, coaxial cable (for broadband and baseband), fiber optic cable and over-the-air methods such as infrared, microwave and radio, he said.

Looking to the problem of how businesses may someday connect their local-area networks to larger public networks, Kleinrock postulated that a system resembling a Xerox Corp.'s Xten architecture could be the solution. Xten, developed by Xerox but never released as a product, was an all-encompassing network developed to link cities by satellite, link the buildings within each city by microwave and link workers within the buildings by a bus local-area network, he reminded his Comnet audience.

But for now, users must rely on packet-switched networks to take their data beyond the confines of their own building. "What is interesting," Kleinrock said, "is how you get to the packet switched network from your terminal."

Unit Allows Interactive Retrieval From Remote Host Computers

TULSA, Okla. — Telex Computer Products, Inc. has unveiled an intelligent attachment for its IBM 3270-compatible 278 CRT terminal that reportedly allows it to store and retrieve interactively information from a remote host computer system and concurrently process local applications.

Called Proffit, the attachment reportedly allows operators to use one keystroke to switch back and forth from on-line 3270 processing to local functions.

The device consists of an Intel Corp. 8088 microprocessor; 128K bytes of main memory expandable to 640K bytes; one 5¼-in. single-sided, double-density diskette with 160K bytes of storage; and a choice of matrix or daisywheel printers.

A double-sided, double-density diskette with 320K bytes of storage along with an optional second diskette also with 320K bytes will be offered in the near future, a spokesman for Telex Computer Products claimed.

The business computer attachment — which does not operate in stand-alone mode — includes a Digital Research, Inc. CP/M-86 operating system. Microsoft, Inc.'s MS/DOS will be available with the device in the near future, the spokesman said. Another option is the TX/SPF Editor for offloading the editing of Cobol programs from remote host systems to the local Proffit system.

The standard Proffit configuration costs $3,500, Telex said from 6422 E. 41st St., Tulsa, Okla. 74135.

Terminal Out for 3270 Users

FRAMINGHAM, Mass. — Emutec, Inc. has introduced a touch-sensitive color CRT terminal said to work within either an IBM 3270 Binary Synchronous Communications or Systems Network Architecture/Synchronous Data Link Control communications network using standard 3270 and light pen attributes.

The Emutec Touche ETT Terminal displays 1,920 characters and functions as an IBM 3278 or 3279 terminal. Data can be diplayed in eight foreground and background colors with inverse video, underline, bold and blink attributes. Characters can be formed in single height/double width, double height/double width and business graphics can be utilized, a vendor spokesman claimed.

The terminal ranges in price from $3,500 to $3,900 and a companion controller unit called the ETC-100 Communications Controller ranges in price from $5,650 to $6,350.

More information is available from Emutec, Inc., 908 Concord St., Framingham, Mass. 01701.

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IBM Expands Peripherals Available for 4700 System

RYE BROOK, N.Y. — IBM expanded the range of peripherals available on the 4700 finance communications system with the 4704 Model 2 display station, four specialized printers and expanded disk storage offering up to 60M bytes of storage.

The 4704 Model 2 can be used to open new accounts, process loans, answer inquiries and conduct a variety of administrative tasks, IBM said.

The 4704 Model 2 can display either 1,920 standard characters or 480 enlarged characters of information on a 9-in. CRT screen. Data can be highlighted with high-intensity characters or fields. The unit costs $2,425 including a 107-key keyboard, IBM said.

In addition, IBM announced the 4720, a four-model line of forms/passbook printers. The 4720 can be shared by two tellers and can print on a variety of documents including recipts, checks, interim statements, passbooks and journal rolls. The printer costs between $3,250 and $4,155 depending on selected capabilities, IBM said.

In addition, a disk storage feature offering 15, 30 or 60M bytes of memory has been attached to the 4701 Model 2 controller. Housed in an expansion frame, the memory increments cost $7,500, $9,300 and $14,700 for the 15-, 30- and 60M-byte configurations, IBM said.

More information is available from the vendor at 900 King St., Rye Brook, N.Y. 10573.

Adapter Bows For SNA/SDLC

SAN JOSE, CAlif. — An IBM Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) local-area loop adapter is available from DPX, Inc.

The SNA/SDLC Loop Adapter reportedly allows a variety of devices operating as IBM SNA 3270s to attach to IBM 8100 SDLC local-areas network loops. Attachment is supported on high-speed, low-speed and remote loops under both IBM DPPX and DPCX operating systems.

Among the devices supported are the IBM Personal Computer, Displaywriter, 3274, 3276, Series/1 and 5280. These devices reportedly can be supported at speeds ranging from 1,200 bit/sec to 38.4K bit/sec and can be directly connected to the Local Loop Adapter or connected via leased or dial data links.

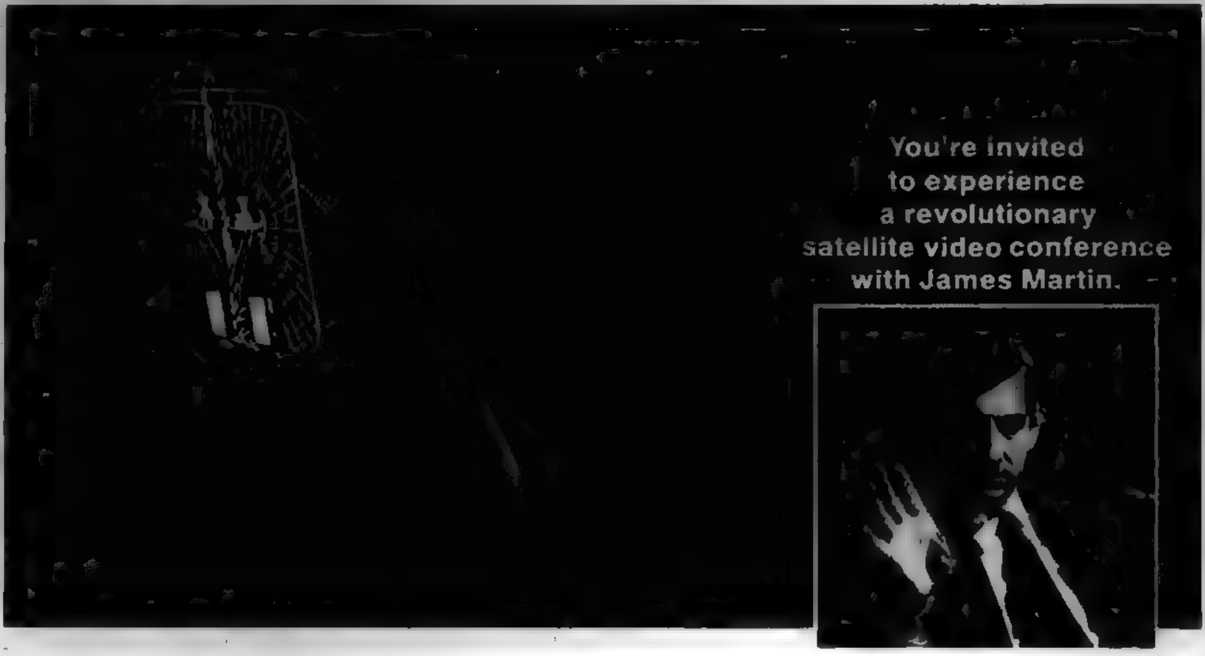
Available in five models that support attachment of up to four devices, prices for the SNA/SDLC Local Loop Adapter start at $995, the vendor said. DPX is located at Suite 104, 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129.

Aid Allows CPU, L-50 Transfer

PINE BROOK, N.J. — Sweda International has introduced a communications software package said to allow users to transfer information between mainframe computers and the vendor's L-50 electronic cash registers with universal product code scanning capability.

The Compac-50 offers both data collection and down-line loading between the L-50 registers and IBM 370 family of mainframe computers or their equivalents. The software is suitable for larger chain operations that need centralized communications between their home office and multiple stores, a vendor spokesman said.

The package is available for $1,000. Sweda International is located at 34 Maple Ave., Pine Brook, N.J. 07058.



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RS-232 Fiber-Optic Link Debuts

RIDGEFIELD, Conn. — Lightwave Communications, Inc. has announced the development of the first in a series of RS-232 fiber-optic data links said to replace standard wire cable and eliminate electromagnetic and radio frequency interference in compliance with new Federal Communications Commission regulations.

The FO-232 is said to be a full-duplex optical modem designed for the transmission of asynchronous data via fiber-optic cable. It is completely plug-compatible with existing RS-232C 25-pin connectors meeting V.24 standards. The unit reportedly is capable of transmitting data up to 1¼ miles at a full transmission rate of at least 19.2K bit/sec, maintaining data integrity through hazardous environments without sacrificing distance or speed.

The FO-232 fiber-optic data link sells for $240/pair in single quantities. Cable is priced according to length. More information is available from Lightwave Communications, 650 Danbury Road, Ridgefield, Conn. 06877.

Analyzer Out For Protocols

PALO ALTO, Calif. — Hewlett-Packard Co. has introduced a protocol analyzer said to feature ease of use, combination of speed, programming capability, mass storage, menu versatility, display formats, trigger sophistication and protocol flexibility.

The HP 4955A provides speeds from 50 bit/sec to 72K bit/sec in the full-duplex mode. It includes 128K words of random-access memory and uses 63 separate triggers to search simultaneously for multiple events, a vendor spokesman claimed. It is used for protocol test solutions for design, installation, troubleshooting and maintenance/planning.

The HP 4955A is available for $20,950 from Hewlett-Packard Co., 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Datastream Cuts Prices On T5, T7

SANTA CLARA, Calif — Datastream Communications, Inc. has reduced prices on its IBM 3270 Binary Synchronous Communications (BSC) remote cluster controllers by approximately 25%. Under the new price structure, members of Datastream's T5 and T7 controller families now range from $4,500 to $15,000, the vendor said.

Sales and production unit increases are behind the price cuts. The T5 and T7 controllers reportedly allow Ascii CRT terminals, personal computers and RS-232 printers to access IBM 3270 application programs using the BSC protocol.

A Datastream T5 controller with six $700 Ascii displays costs $11,200, a vendor spokesman said. More information is available from Datastream Communications, located at 1115 Space Park Drive, Santa Clara, Calif. 95050.

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Here's another big advantage: The Zeus 4 is designed for low maintenance, low down-time. Its four modules snap in and out with a few minutes work. So if repairs are ever needed, modules are simply replaced through OSM's limited warranty program.

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Allows Up to 64 Lines

DEC Minis Get Mux/Concentrator

COSTA MESA, Calif. — Emulex Corp. has introduced a combined communications multiplexer and statistical concentrator said to allow up to 64 local and/or remote lines to be connected to any Digital Equipment Corp. PDP-11 or VAX-11 minicomputer using a single backplane slot and without modification of standard software.

The Statcon Series 11 is offered in two DEC emulating models. The CSM11/MH for the PDP-11 is software transparent to DEC operating systems and diagnostics and is available for $7,300 for a 16-channel system. The CSM11/MU for the VAX-11 uses an Emulex-developed and supported VMS/UH software package and is available for $7,600 for a 16-channel configuration.

More information on these products is available from Emulex Corp., which is located at 3545 Harbor Blvd., P.O. Box 6725, Costa Mesa, Calif. 92626.

Net Management System Performs Isolation Testing

EAST NORWALK, Conn. — Datacomm Management Sciences, Inc. has introduced a microprocessor-controlled network management system said to provide the manager with the means to perform proactive and reactive fault isolation testing from a central location.

The Automated Network Management and Control System (Anmacs) reportedly provides automated testing features such as alternate circuit routing, facilities monitoring, equipment sparing/patching as well as integrated manual patching/monitoring and testing capabilities.

Anmacs is available for $100,000 from 25 Van Zant St., East Norwalk, Conn. 06855.

Module Transmits at 50M Bit/Sec

WORCESTER, Mass. — Artel Communications Corp. has introduced a plug-in fiber-optic communications module set said to transmit transistor-transistor logic/emitted-coupled logic digital data signals at up to 50M bit/sec.

The T/R-2010 is a transmitter and receiver set that verifies operation through the use of a remote loopback test feature. A test switch on the front panel activates a test pattern that is recognized by the 2010 receiver, a vendor spokesman said. At 50M bit/sec, the system has a one-mile distance capability and, at 25M bit/sec, a two-mile capability.

The transmitter and receiver together are available for $1,500 from Artel Communications Corp., P.O. Box 100, West Side Station, Worcester, Mass. 01602.

PSI Announces Repair Service

WOBURN, Mass. — PSI Computer Services, Inc. has announced a repair service for dumb, intelligent and color-graphics video terminals.

Called the PSI Depot Express, the service is available on a variety of terminals. The vendor claimed a five-day turnaround time plus a 24-hour emergency turnaround service.

Typical charges are $100 for control units, $75 for keyboards and $50 for power supplies. The vendor is located at 150-F New Boston St., Woburn, Mass. 01801.

Books Cover IBM System/34

SILVER SPRING, Md. — Two new publications for users of the IBM System/34 have been released here by Professionals Unlimited.

The System/34 How and Why Book covers procedure writing, sorting, tables, arrays, data structures, system tuning and coding for performance. It costs $39.95.

The Program of the Month Club is a monthly publication that features one program that readers may use and learn from, the publisher explained. An annual subscription to this publication costs $49.00.

Professionals Unlimited is based at 3951 Lantern Drive, Silver Spring, Md. 20902.

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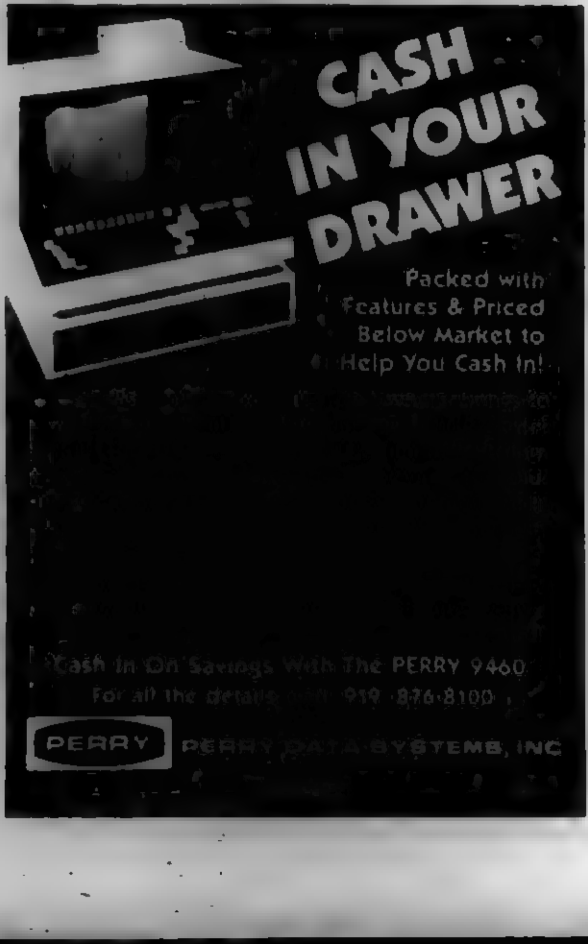

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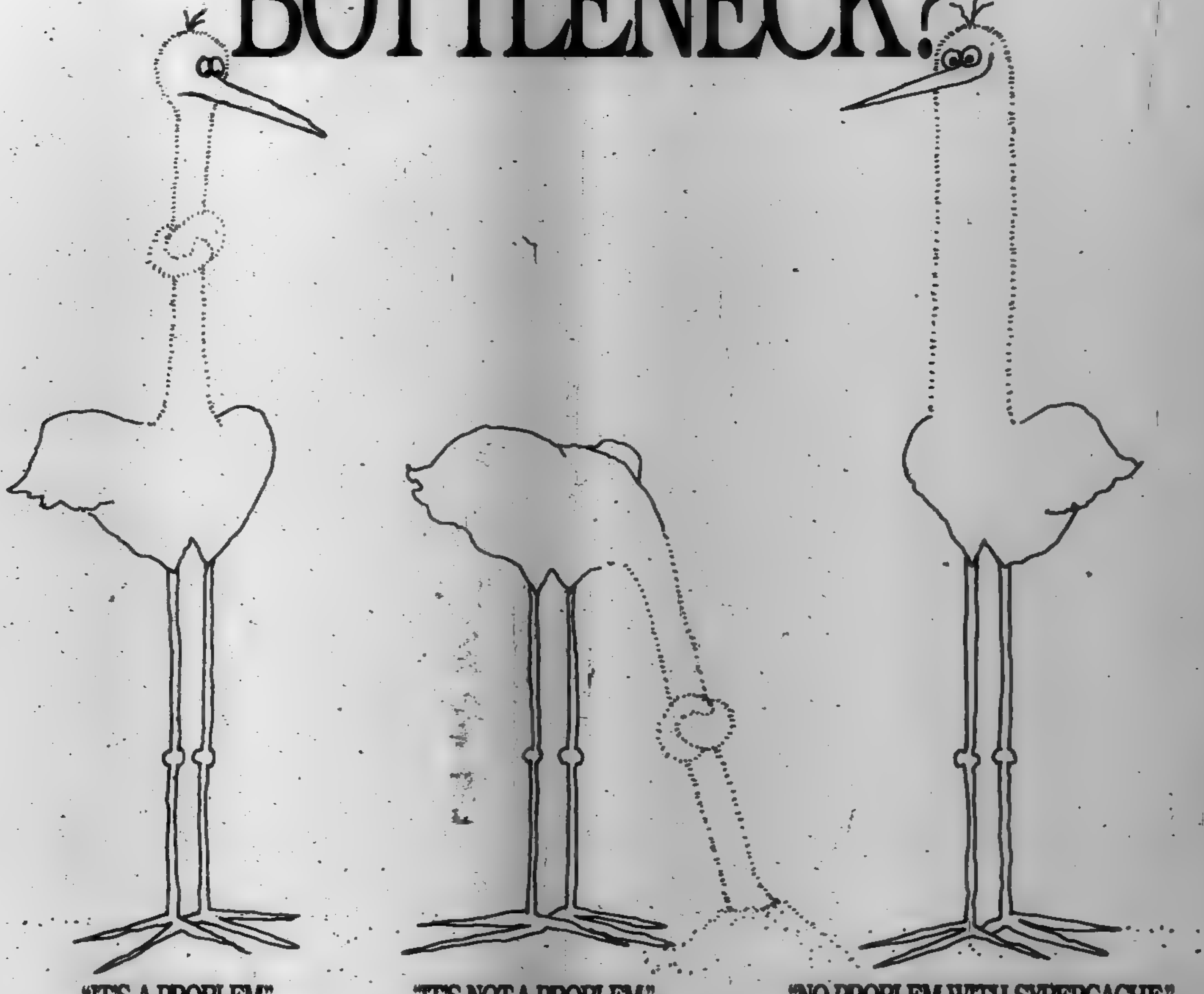

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Intelligent Controller Out For DEC PDP-11s, VAX-11s

HUNTSVILLE, Ala. — General Digital Industries, Inc. (GDI) has introduced an intelligent controller for applications requiring high-speed data transfer between a Digital Equipment Corp. PDP-11 or VAX-11 host and external devices.

The GDI DMA-700 controller is said to provide buffered direct memory access data transfers at data rates up to 1M byte/sec. Device control can be programmed into the controller to unburden the host computer, a vendor spokesman claimed.

The controller is available for $3,500, the spokesman said from General Digital Industries, Inc. at 7702 Governors Drive, Huntsville, Ala. 35805.

Two Modem Adapters Offered

BRISTOL, Conn. — Superior Electric Co. has introduced two modem adapters that allow the company's Stabiline ac voltage monitor detector modules or printer/controllers to be interfaced to industry-standard RS-232 modems for communications over conventional telephone lines.

The Stabiline modem adapter facilitates the transmission of data to the voltage monitor, which distinguishes and identifies low and high voltage levels, sags and surges, impulses, common-mode noise and power outages. Ten transmission rates are available.

The modem adapter is available for $300 for either the printer/controller model (MAP100) or the detector module (MAD100). More information is available from Superior Electric Co., 383 Middle St., Bristol, Conn. 06010.

Optic Link Out for DPS 8 Minis

PHOENIX — Honeywell, Inc.'s Large Information Systems Division has announced a fiber-optic link for its DPS 8 line of minicomputers and the firm's high-speed line printers.

The fiber-optic technology allows a printer to be placed up to 1.2 miles away from the processor, Honeywell said.

The fiber-optic cable can be used with Unit Record Processor (URP) Models URP 8001, 8003 and 8004. The cable can be used with Model PRU 901/1201 printers.

The advantage of using glass fiber cable, Honeywell said, is it is immune to electromagnetic interference and radio frequency emission. A high speed line printer, for example, can be located remotely in noisy environments. In addition, Honeywell says the fiber cables provide enhanced data security.

A printer adapter is also available as a control board and connector between the unit record processor and the printer. The cable comes complete with all adapter connectors.

The fiber-optic cable costs $5 per meter. The printer optical cable adapter costs $3,000.

Additional information can be obtained from Honeywell through P.O. Box 8000/T-6U, Phoenix, Ariz. 85066.

USI International Adds 14-In. Color Monitor to Line

BRISBANE, Calif. — USI International Corp. has added a 14-in. composite video color monitor to its line of amber and green monitors. The new monitor was designed for dedicated use with personal and business computers.

The 1400/C color monitor reportedly eliminates the two-step process of converting the computer's video signal to a form that a television can receive and the subsequent conversion within the television set to a pure video signal. This eliminates the loss of image quality that is inherent in television use with a personal computer, according to a vendor spokesman.

The monitor retails for $399, with volume discounts and end-user support available. USI is located at 71 Park Lane, Brisbane, Calif. 94005.

Protocol Converter Announced

MINNEAPOLIS — Instrumentation Services, Inc. has introduced an IBM-compatible protocol converter system said to connect an IBM 3274/3276 controller to a standard Ascii RS-232 printer.

The ISI-87 is said to require no software changes to existing programs and offers transmission rates from 75 to 9,600 bit/sec.

The protocol converter is available for $1,650 from Instrumentation Services, Inc., 957 Winnetka Ave. N., Minneapolis, Minn. 55427.

Modem Targets Apple Micros

NEW BRIGHTON, Minn. — A 1,200 bit/sec modem said to provide full-duplex communications over standard dial-up telephone lines for Apple Computer, Inc. Apple II, Apple II-Plus or Bell & Howell Co. computers has been announced by Multi-Tech Systems, Inc.

The Multi-Modem II can also reportedly communicate at 110 or 300 bit/sec and is compatible with other 103-, 113- and 212-compatible equipment.

The unit costs $750 from the firm at 82 Second Ave. S.E., New Brighton, Minn. 55112.

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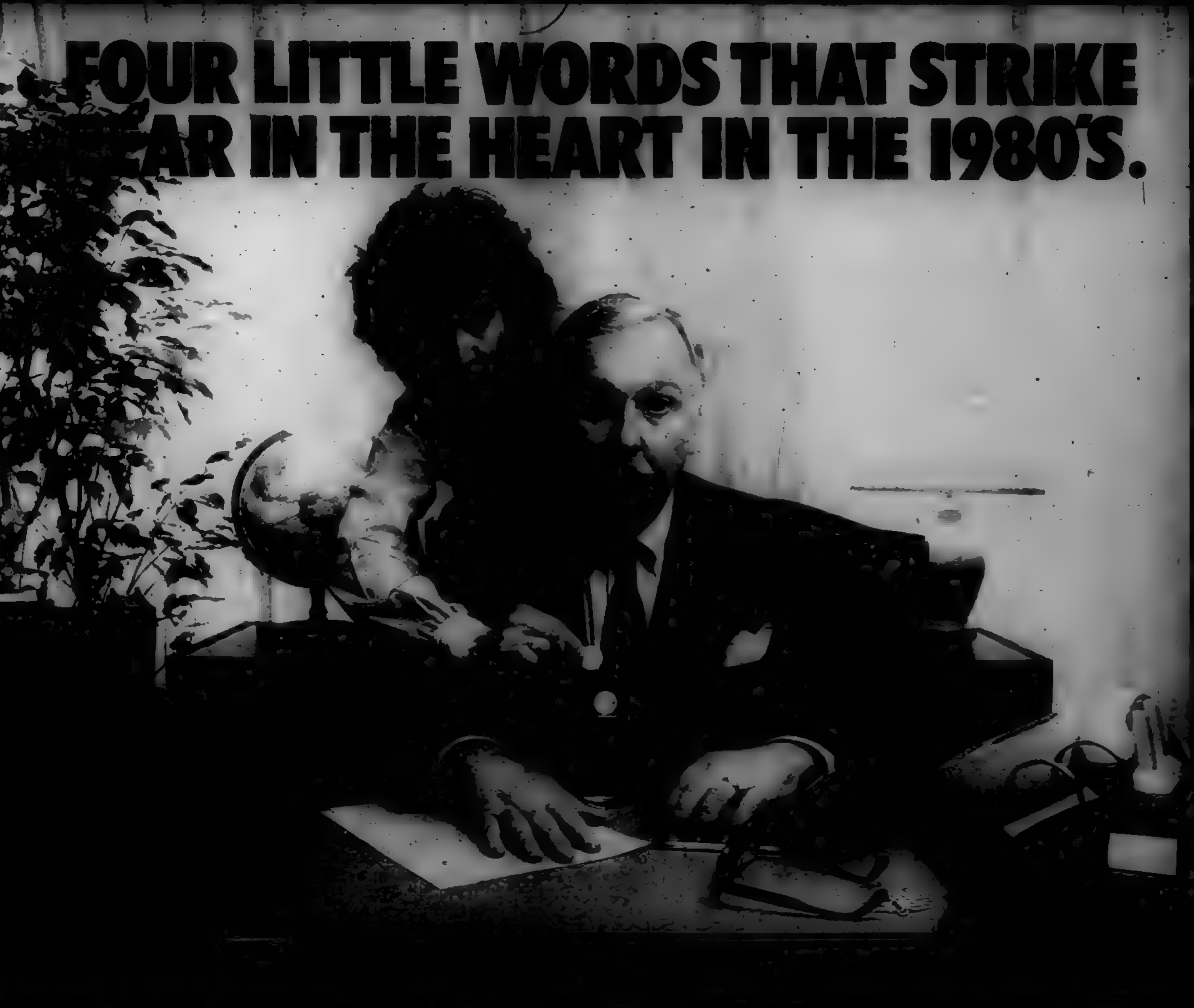

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An added benefit of the Stratus fault tolerant design is that you can expand your system with additional processors as your computing needs grow. In fact, you can have up to 32 fault tolerant processors, 2000 communication lines, and 100 billion bytes of storage in a single Stratus system.

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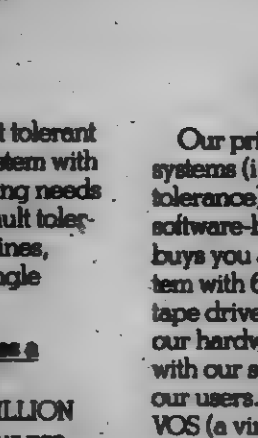

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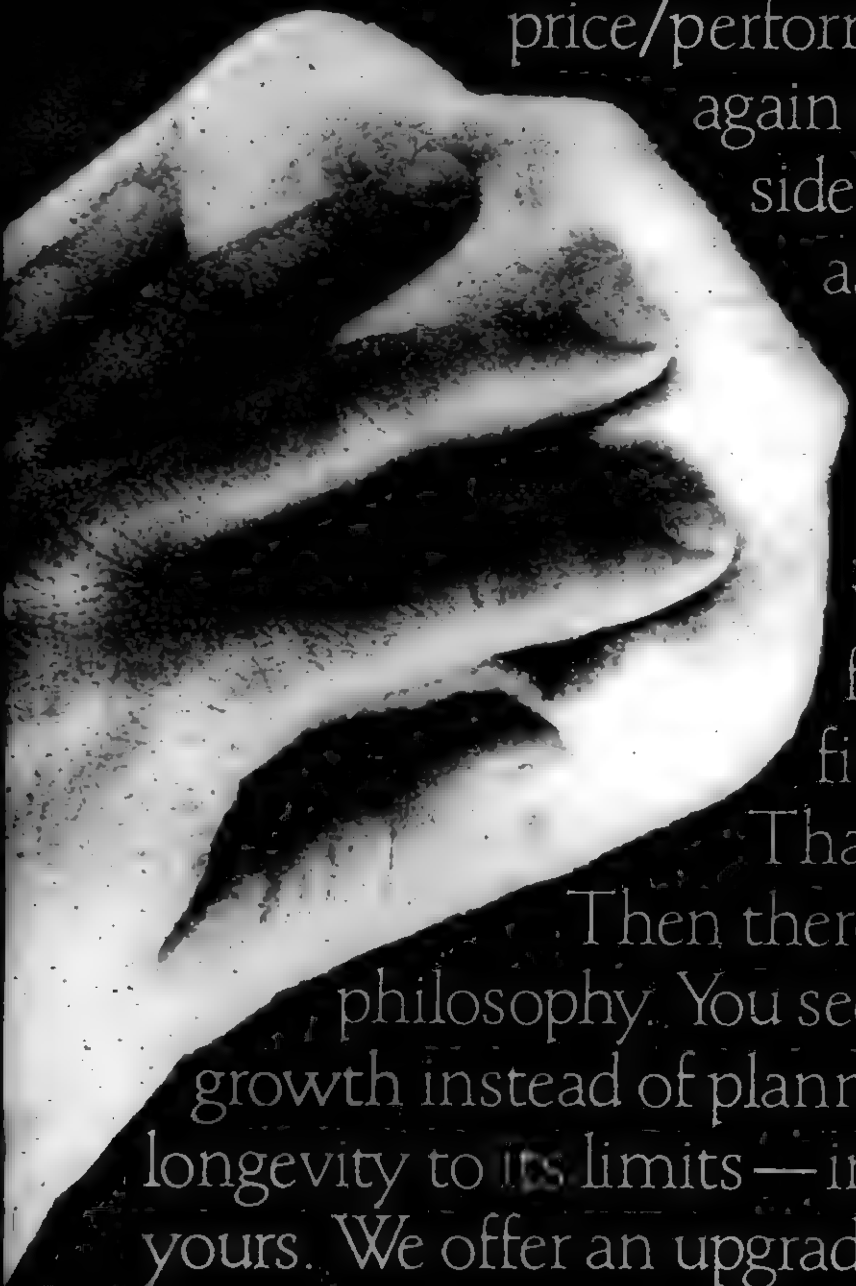

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RS-232C Version

TC 103 Targets Local Nets

CULVER CITY, Calif. — IXO, Inc. has introduced an RS-232C version of its telecomputing system designed for local network applications.

The TC 103 is suitable for hardwired installations in a fixed location or for portable use where it can be plugged directly into a computer system.

The TC 103 is a hand-held terminal with a built-in modem, telephone line interface and autodial/auto-log-on capabilities. It also features a 16-char. liquid crystal display, a vendor spokesman said.

The terminal is available for $400 from IXO, Inc., 6041 Bristol Pkwy., Culver City, Calif. 90230.

Controllers Extend System

FORT LAUDERDALE, Fla. — Racal Milgo, Inc. has extended the capabilities of its IBM 3270-compatible display systems with the introduction of two cluster controllers.

The Models 4274LB and 4274LN controllers attach directly to the block, byte or multiplexer I/O channels of the IBM 370, 30 series and 4300 series mainframes. The controllers will allow the vendor's terminals to support local data processing environments.

The 4247LB operates with non-Systems Network Architectecture (SNA) host systems while the Model 4274LN uses SNA protocols. The price for either model is $18,695 and 60-month leases are available at $496/mo. More information is available from Racal-Milgo, Inc., 6250 N.W. 27th Way, Fort Lauderdale, Fla. 33309.

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Ramtek's popular 6211 Colorgraphic Terminal is now just $4995.* This versatile desk-top unit is ideally suited for the majority of color graphic applications in CAD, science, business, and control systems. Rack mounted (without monitor), it's even more of a value at just $3995.

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*Light pen sold separately

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Cromemco Offers Modem/Dialer

MOUNTAIN VIEW, Calif. — Cromemco, Inc. has announced an intelligent modem/dialer that incorporates an 8-bit microprocessor.

Called the MDM-12000, the unit is a full-duplex modem that can operate at between 300 and 1,200 bit/sec. Designed for direct connection, a cord from the modem plugs directly into a modular telephone jack, according to the vendor.

The unit costs $1,495, the vendor said from 280 Bernardo Ave., Mountain View, Calif. 94043.

I/O Links Aid Upgraded Units

SACRAMENTO, Calif. — An assortment of I/O interface products are said to expand I/O interaction with a variety of text terminals upgraded with the Gen.II Retro Graphics terminal enhancement from Digital Engineering, Inc.

The interfaces are offered for Gen.II Retro Graphics updated VT100, VT101, VT102, VT103, VT131 and VT132 terminals from Digital Equipment Corp., models from Televideo, Inc., Lear Siegler, Inc. and others.

List prices for the interfaces range from $170 to $360 from Digital Engineering at 630 Bercut Drive, Sacramento, Calif. 95814.

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Memorex Unveils Storage Subsystem For IBM CPUs

SANTA CLARA, Calif. — Memorex Corp. has introduced the Memorex 3864, a solid-state information storage subsystem designed to improve overall system performance for IBM and compatible mainframes, particularly in systems with heavy paging and swapping, such as high-transaction environments with many terminals.

The Model 3864 reportedly provides users with a high-speed, cost-effective, microprocessor-intelligent device that offers fast on-line response times and improves transaction rates. It is plug-compatible with IBM's 370, 30 series, 3080 series and 4300 CPUs. It is also a plug-compatible replacement for the IBM electromechanical 2835/2305 subsystem, according to the vendor.

Full software compatibility is maintained when emulating a 2305 Model 2 under IBM operating systems, including MVS, VM and XA.

The 3864 reportedly utilizes 64K-bit random-access memory chips, pages 550 page/sec/channel, reduces CPU wait time by increasing the paging rate per channel, offers double-bit error detection and correction, transfers data at 4M byte/sec, reallocates marginal memory to spare memory areas and allows diagnosis and maintenance to be performed remotely via a telephone link.

The Memorex 3864 costs $255,000 for a typical configuration with two storage controllers and 24M bytes of memory. Leasing alternatives are available through the Memorex Finance Co.

Memorex Corp. is located at San Tomas at Central Expwy., Santa Clara, Calif. 95052.

Supermini, Workbench Offered in PE Package

OCEANPORT, N.J. — Perkin-Elmer Corp. has put together a packaged system, consisting of its Model 3210 supermini computer and the Edition VII Workbench version of the Unix operating system, that makes it easier for users to develop programs for multiuser environments.

The packaged system includes the 3210 with 512K bytes of memory, 64K bytes of attachable memory, eight communications lines, the vendor's Model 55B console terminal and an eight-port Edition VII Workbench license.

Available options include a 96M-byte disk drive, substitution of 1M byte or 2M bytes in place of the basic 512K bytes, eight-port expansion and one week of installation and training. A library of Unix-compatible software packages is also available.

Suited for Various Applications

The new system is best suited for applications involving general software development, word and text processing, time-sharing, software configuration management, networking and applications development and testing. The Edition VII Workbench version of Unix is also available with the company's 3230 and 3250 minicomputers.

Because of its high degree of portability and compatibility, the vendor claims the Unix-compatible system has attracted a variety of military/aerospace, government, university and commercial users.

In addition to the 3210-based packaged system, Perkin-Elmer also announced it is increasing end-user discounts on the Unix operating system to 30% for the second system purchased, 40% for the third through fifth systems and 50% for the sixth and subsequent systems.

Available as an off-the-shelf product, Perkin-Elmer was the first minicomputer manufacturer to offer a standard version of the Unix operating system.

Priced at $49,950, the packaged system is immediately available from the vendor's Data Systems Group, which is located at 2 Crescent Place, Oceanport, N.J. 07757.

Inforex Batch Entry System Out

BURLINGTON, Mass. — Inforex, Inc. has announced the System 3150, a high-volume batch data entry system that reportedly can be attached to virtually any host processor.

The system features a central control unit with 128K bytes of main memory, 5M bytes of disk storage and a tape drive. Up to 16 keystations can be attached, the vendor said.

The System 3150 comes with the OS/315 operating system and has been engineered for high-volume data entry with keystroke processing a top priority, according to a vendor spokesman. The firm's Data Editing and Arithmetic Language can perform data reformatting in a background mode, the vendor said.

System 3150 costs between $14,200 and $18,200 depending on configuration, the vendor said from 186 Middlesex Tnpk., Burlington, Mass. 01803.

HP Announces Winchester Drives, Cuts Disk Prices

PALO ALTO, Calif. — Hewlett-Packard Co. has unveiled two Winchester disk drives that integrate a cartridge tape drive for backup and I/O purposes. The company also announced it is reducing prices on its rigid and flexible disks, as well as its tape drives, from 4% to 23%.

The HP 7914 provides up to 132.1M bytes of formatted disk storage along with a tape cartridge. The disk drive has twice as much storage capacity as the vendor's HP 7912, for a 20% increase in price. The HP 9134B holds up to 9.7M bytes of formatted data. It has twice as much storage capacity as its predecessor, the HP 9134, for a 25% increase in price.

Both units, a spokesman said, are also available as combination products, called the HP 7914TD and HP 9133B.

The HP 7914TD mass-storage subsystem incorporates the company's HP 797OE ½-in. magnetic tape drive. The subsystem can be ordered with either one or two disk drives and with or without the 67M-byte cartridge drive.

The HP 9133B combines the 10M-byte HP 9134B with a 3½-in. removable microfloppy disk drive, designed for file backup, software distribution and data interchange between systems.

The HP 7914 disk drive costs $19,900 and the HP 7914TD mass-storage subsystem costs $26,540. The HP 9134B drive lists for $4,360.

More information is available from Inquiries Manager, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

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Nothing Was Lost

Medical Software Firm Survives System Deluge

By Susan Blakeney
CW Staff

EAST LANSING, Mich. — Something caught Lee Risemberg's eye as she walked by the computer room at Logistikos, Inc., where she was working overtime the evening of January 19.

It was 6 p.m. when Risemberg, office manager at the Midwestern medical software firm, noticed water dripping from the computer room's plaster ceiling — right above the company's IBM System/38.

"It was coming from a pipe to the overhead sprinkler system — which had been capped off because you don't want water near the computers," she explained. "A 'T' joint that holds two pipes together split."

Suddenly, the drops turned into a flood, causing the ceiling, lighting and 2,500 gallons of water to come crashing down on the IBM machine.

Risemberg called the emergency police number which instructed her and anyone left in the building to evacuate. "We were afraid because the 220 V power line in the computer room was getting wet. An electrician came and cut the power, then the janitor came and shut down the water."

Next, Risemberg called IBM to find out what to do about the System/38. "About 9 o'clock, a representative came out. He told us to open up all the doors to let the water out and get as many fans on the system as we could find."

Risemberg said they borrowed fans from neighboring restaurants and homes and ran them all night.

"At 8 a.m. the next day, the system came up. The only thing to show for it [the disaster] was an 'abnormal termination' message. We lost nothing," Risemberg said.

Dot Matrix Printer Works With HP's HGL Protocol

SAN JOSE, Calif. — A color dot matrix printer with the ability to accept and convert pen plotter vector data has been unveiled by Envision Technology, Inc.

The Envision 430 Color Vector Printer features a software interface for programming, compatible with Hewlett-Packard Co.'s HGL plotter protocol for color graphics. It also features 125 char./sec letter-quality alphanumerics, 300 dot/in. horizontal high-resolution graphics, a variety of type fonts and the ability to print multipart forms.

The unit costs $4,950 from the firm at 631 River Oaks Pkwy., San Jose, Calif. 95134.

Memorex Cuts Prices for 3680

SANTA CLARA, Calif. — Memorex Corp. has announced price changes on its family of large disk drive subsystems, including a volume purchase agreement, leasing alternatives and a revision of lease and purchase prices for its 3680 subsystem.

The new volume purchase agreement is for a minimum term of one year, which may be renewed on an annual basis with retention of previously quoted discounts, according to the vendor. Discounts range from 7% to 12%.

The purchase prices on the 3680 subsystem have reportedly been reduced by 15%.

Further details can be obtained from Memorex, located at San Tomas at Central Expwy., Santa Clara, Calif. 95052.

Plotter Debuts From Numonics

LANSDALE, Pa. — Numonics Corp. has unveiled a 24-in.-wide plotter said to offer line quality and resident firmware.

The Model 5424 features a stepper motor drive that reportedly produces a high acceleration rate for fast short-vector throughput as well as a standard RS-232C interface.

The 5424's low-inertia grit wheel paper transport was designed to enhance line quality and uses nonsprocketed paper, eliminates slips and increases repeatability, according to the vendor.

The plotter contains resident programs for plotting smooth, nonpolygonal arcs and circles; accepts cut-sheet, A1- or A2-size paper; and adjusts for 22-in. and 24-in. widths, producing plots up to 24 in. by 36 in., the vendor said.

The Model 5424 costs $2,975 from Numonics Corp., located at 418 Pierce St., Lansdale, Pa. 19446.

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ECS 4500 Network Terminal

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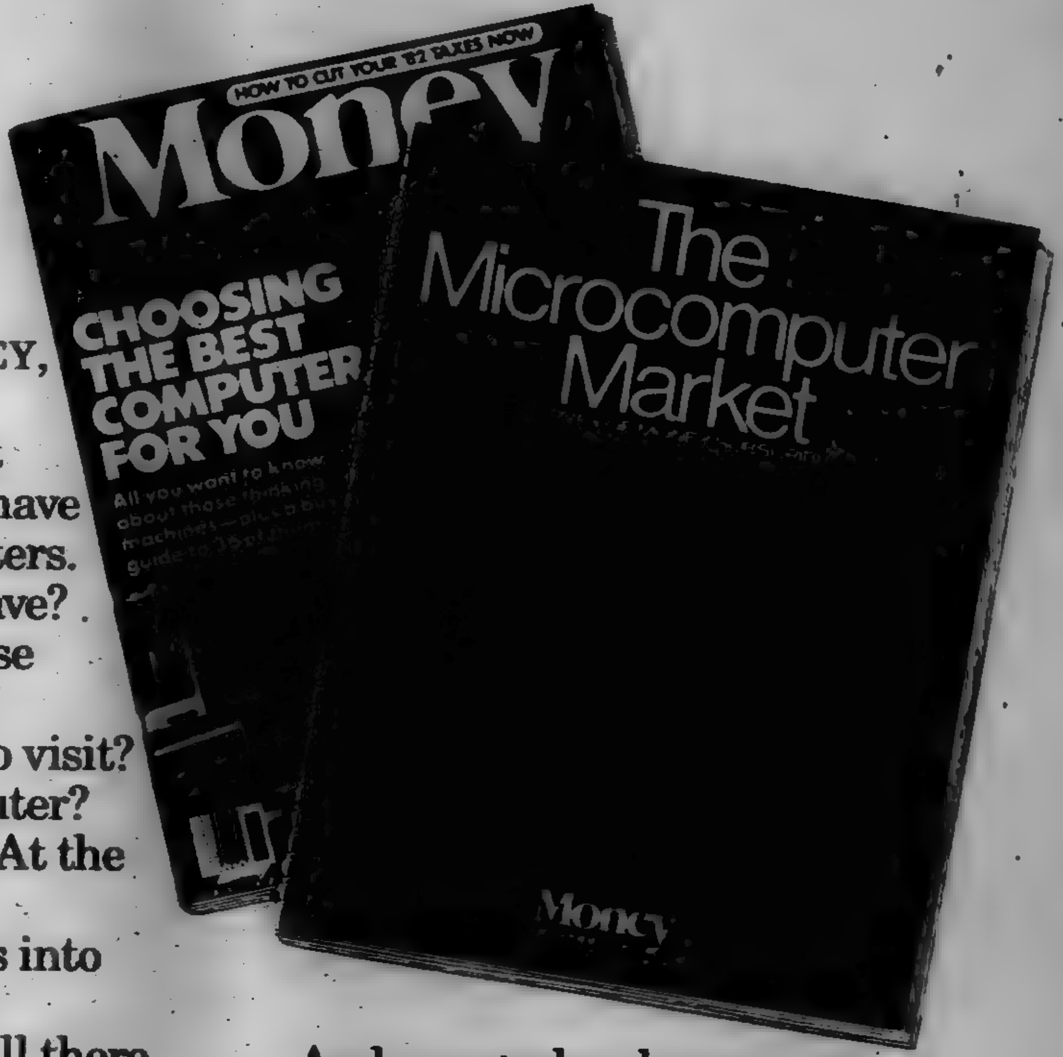
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Inventory Turnkey Targets Retail's Hot Items

GAITHERSBURG, Md. — Computer Systems Support Corp. has unveiled a turnkey inventory and merchandising control system for retailers selling furniture, appliances and other "big ticket" items.

The Big Ticket Inventory and Merchandising System (Btims) is said to provide on-line information on the status and location of all merchandise in inventory or on order.

It generates locater tags, inventory check lists and a series of management reports to help track sales. Sales, delivery and price change are available on a daily or weekly basis.

Featuring a multilevel security system, Btims is designed for retailers with an average turnover of up to 1,200 items a day. A mid-range configuration includes a Data General Corp. S-140 Eclipse with 512K bytes of main memory, two 100M-byte disk drives, 24 ports, 18 to 20 CRTs and four to six hard-copy printers.

The mid-range configuration costs about $150,000, with a five-year software lease priced at $2,500 to $3,000/mo, a spokesman said from 9112 Gaither Road, Gaithersburg, Md. 20877.

Board Fits Comemco's S-100

MOUNTAIN VIEW, Calif. — A 256K-byte random-access memory (RAM) card for use in Comemco, Inc.'s S-100 compatible computer systems is now available from the company.

Designated the Model 256KZ RAM card, this product is intended for use in a multiuser, multitasking environment with the vendor's Cromix operating system and with Cromemco's 8/16/32-bit Dual Processor Unit, the vendor said.

The product reportedly switches from contiguous memory to bank-selected memory automatically as needed. It also incorporates 8-bit and 16-bit read-write operations in accordance with the IEEE 696 Standard, according to a spokesman for the vendor.

The board is available for $1,295. Cromemco is based at 280 Bernardo Ave., Mountain View, Calif. 94043.

Retailers Get Inventory System

PHILADELPHIA — Regi-Tel Systems, Inc. (RSI) has unveiled a turnkey point-of-sale inventory control system designed for hard goods retailers.

The RSI 800A and 800B reportedly are based on the TEC 2200A and Televideo, Inc.'s TS-806 and TS-816 microcomputers and are intended to offer on-line control of inventory status, purchasing functions and detailed sales analysis for one to 16 users and up to 34,000 inventory items.

The RSI 800A includes a TS-806 with 64K bytes of main memory, 20M bytes of Winchester hard disk storage, a 5M-byte, 5½-in. floppy disk drive, a Televideo TS-800 terminal, an Okidata Corp. 200 char./sec ML-84 printer, an RSI Alpha Display Unit and all necessary software and cables.

It reportedly will accommodate up to six users simultaneously and costs $18,990.

The RSI 800B configuration includes a TS-816 with 128K bytes of main memory, a 40M-byte Winchester drive, a 17.2M-byte tape streaming drive, a TS-802 terminal, an Okidata ML-84 printer and an RSI Alpha Display Unit. It reportedly can accommodate up to 16 users simultaneously and costs $26,445.

More information is available from Regi-Tel Systems, the vendor said from 1015 Ridge Ave., Philadelphia, Pa. 19123.

Solarcom Offers 8088-Based Board

HAYWARD, Calif. — Solarcom Technology, Inc. has introduced an Intel Corp. 8088 microprocessor-based computer board. It is said to be STD bus-compatible and to contain on-board memory capacities up to 128K bytes.

The SCMT-88 reportedly incorporates an advanced address selection technique, allowing the users to select from a family of byte-wide read-only memories (ROM), erasable programmable read-only memories (Eprom) and static and pseudostatic random-access memories (RAM). Eight 28-pin sockets give the user on-board addressing capacity ranging from 2K bytes to 128K bytes of memory. Each of the 28-pin sockets is compatible with the standard Jedec package and can be configured to accept from 2K byte- to 16K byte-wide ROM/Eprom or RAMs.

The micro-based board executes Intel's 8086 instructions, contains an Intel 8284A clock generator, is capable of addressing 64,000 I/O ports and operates on +5 V.

The SCMT-88 costs $475 with 32K bytes of RAM. More information is available from Solarcom Technology through P.O. Box 4715, Hayward, Calif. 94544.

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Statistics Modules Menu

    A) DESCRIPTIVE
    B) REGRESSION
    C) ANOVA
    D) TIME SERIES
    E) MULTIVAR

(ESC)) Exit to Master Menu
Choice – [ ]
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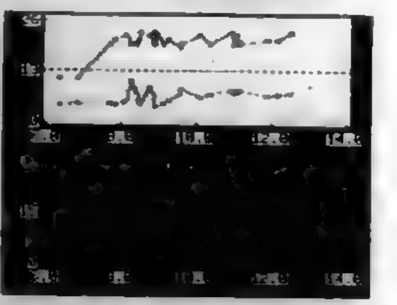

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You can save your graphics on a disk for a multiple color "slide show" presentation, or print them out through a variety of compatible printers.

STATPRO documentation wraps up the package.
Although STATPRO software is essentially self-documenting, complete print documentation is provided. This includes walk-through tutorials, easy to understand pocket reference guides and comprehensive user's guides.

STATPRO currently runs on the Apple® II and Apple III personal computers. It will soon be available for the IBM® PC.

Find out more about STATPRO: The Statistics and Graphics Database Workstation.
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Now, a supermini you can grow with at a price you can live with. The 3210. Only $42,000.

The Perkin-Elmer 3210, the most powerful system in its class, is now also the most expandable.

And the $42,000 price tag (U.S. only) makes it the most affordable 32-bit supermini system on the market. (OEM quantity of 100, $26,000.)

Software Power

You get full 32-bit software performance. Programmers can work interactively in any mix of these high-level languages—FORTRAN, COBOL, Pascal, Basic II and RPG II. A whole range of FORTRAN compilers are available right up to our state-of-the-art universally optimizing FORTRAN VII Z.

A standard version of Bell Laboratories' UNIX™ general-purpose time sharing software development system runs on the 3210. And we fully support it.

Or you can have Reliance PLUS, a software package with everything you need for high-performance transaction processing including a transaction controller, a relational DBMS; a data dictionary and query/report processing.

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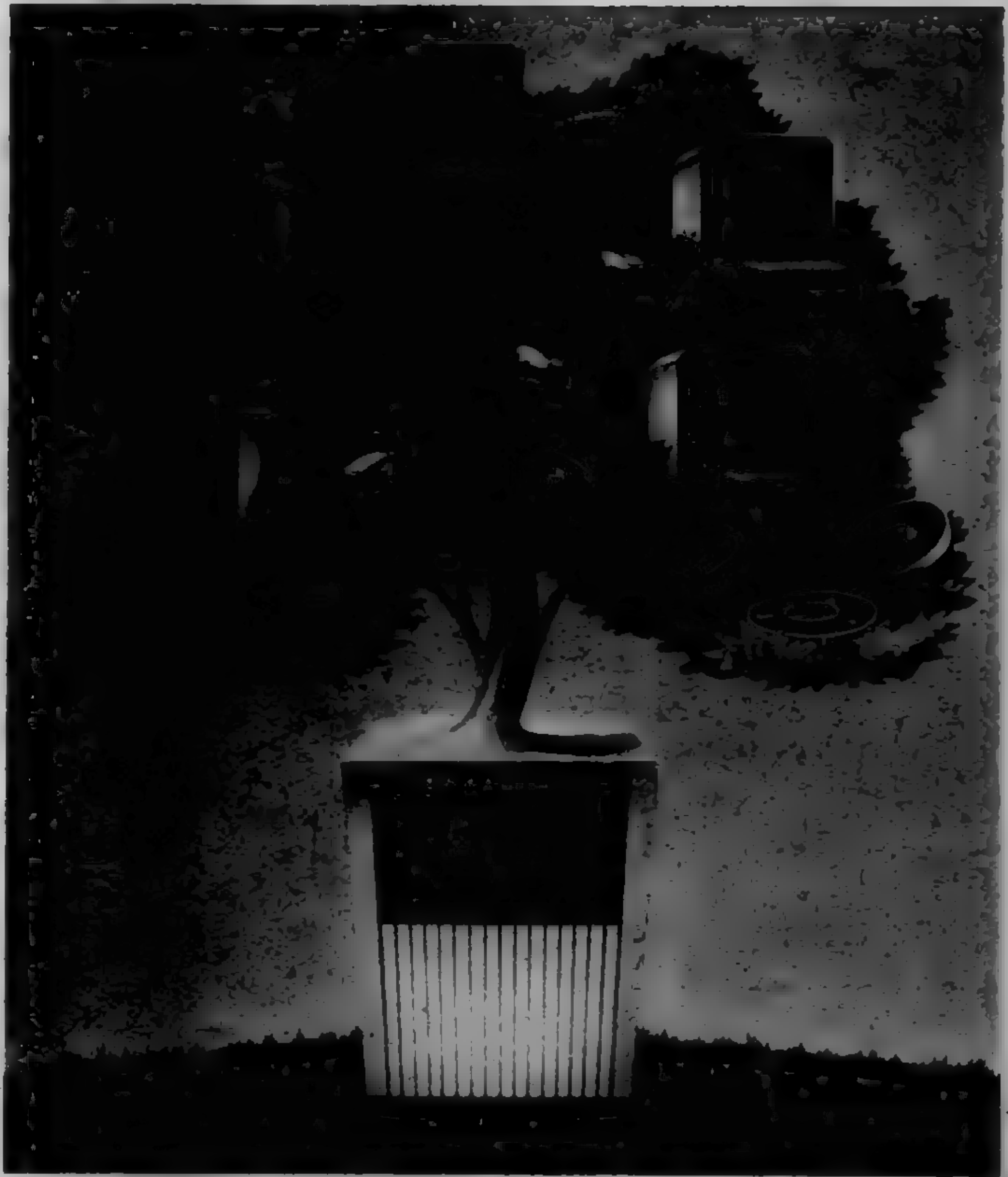
Hundreds of third-party packages that can save you time and money are also available.

Expansion Power

With the 3210 you can expand system capability without having to trade up to a bigger CPU. You can get as much as 4MB of directly addressable memory. The 3210 can support up to 32 terminals concurrently. And you can string up to a whopping 28 gigabytes of disc storage on the 3210.

The 3210 gives you a choice of disc options from 32MB to 300MB. And the system supports 800, 1600 and 6250 bpi tape drives.



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PERKIN-ELMER

Intelligent Controller Out

CERRITOS, Calif. — A single-board intelligent controller said to make Rosscomp Corp.'s D160 ½-in. streaming tape drive hardware- and software-compatible with any ¼-in. tape cartridge drive using the QIC interface standard has been announced by the firm.

The C160-90A-B controller provides an 8-bit parallel connection to the host processor and handles data separation, tape formatting and error correction and control, according to the vendor.

It is said to support nonstop streaming file backup and restore at speeds of 90 in./sec, equivalent to approximately 5M byte/min.

Scheduled to be available in the second quarter, single units cost $600.

Rosscomp Corp. is located at 16643 Valley View Ave., Cerritos, Calif., 90701.

Multiuser Business Micro Unveiled by Rair Computer

SANTA CLARA, Calif. — Rair Computer Corp. has unveiled its next generation multiuser microcomputer intended for business use.

The Rair Business Computer is a desktop turnkey system that supports up to four user workstations with 19M bytes of Winchester storage, up to 1M byte of random-access memory (RAM) and 8- and 16-bit microprocessors. It is reportedly compatible with both 8- and 16-bit versions of Digital Research, Inc.'s CP/M and MP/M operating systems.

An entry-level single user station configured with 19M bytes of Winchester, 1M-byte floppy drives and 256K bytes of RAM is priced at $8,500. Further information can be obtained from Rair at 4101 Burton Drive, Santa Clara, Calif. 95050.

Graphics System Creates Labels

LOWELL, Mass. — Lowell Systems, Inc. has introduced a graphics computer system said to create and print custom shipping and material tracking labels.

The Model 1010 Labeltronic System reportedly integrates forms design with data entry and complete graphics printing capability and features a high-resolution CRT terminal.

The Digital Research, Inc. CP/M-based system consists of a standalone micro with 64K bytes of dynamic random-access memory, dual 5¼-in. floppy diskette drives having 1.2M bytes of storage each and a 150 line/min high-resolution Printronix, Inc. graphics printer.

The Model 1010 Labeltronic System is priced from $13,930, depending upon options chosen. Lowell Systems is located at 150 Industrial Ave. E., Lowell, Mass. 015852.

Graphics System Fits IBM Micro

RESTON, Va. — Scion Corp. has unveiled a color graphics display system for the IBM Personal Computer.

The PC640 Professional Color single-card hardware/software package reportedly generates a 640 by 480 pixel, 16-color display from its onboard 256K-byte memory.

The unit's display memory resides directly in the IBM micros address space, thus being user-accessible for special applications involving high-speed saves and loads to disk.

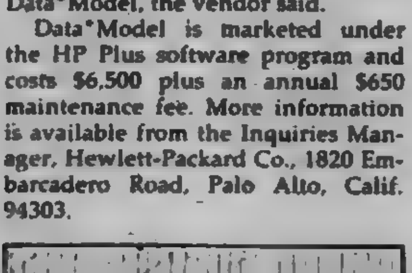
The unit costs $1,595 from Scion at 12310 Pinecrest Road; Reston, Va. 22091.

Modeling Tool Out for Image

PALO ALTO, Calif. — In a joint announcement, Hewlett-Packard Co. and Minicomputer Modeling, Inc. have announced Data*Model, a financial modeling package for HP's Image data base and DSG/3000 graphics packages.

Data*Model allows software developers to move data between the financial modeling package and external files without custom programming. Data may be either read from or written to external files. The Image data base can be accessed directly through files created using HP's Rapid/3000 Transact program. In addition, user-defined sequential Ascii files can also be interfaced with the Data*Model, the vendor said.

Data*Model is marketed under the HP Plus software program and costs $6,500 plus an annual $650 maintenance fee. More information is available from the Inquiries Manager, Hewlett-Packard Co., 1820 Embarcadero Road, Palo Alto, Calif. 94303.



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The FPS-164 Attached Processor—A Unique Solution for Cost-Effective Scientific Computing.

Now, VAX™, IBM and Sperry users can get a powerful tool specifically designed for solving computationally-intensive problems.

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When attached to a VAX, IBM or a Sperry system, the FPS-164 offloads and processes computationally-intensive tasks, leaving the host computer free for other work. The FPS-164 will expand your computer's capability, relieve its overload and make it possible to solve problems that your system previously could not.

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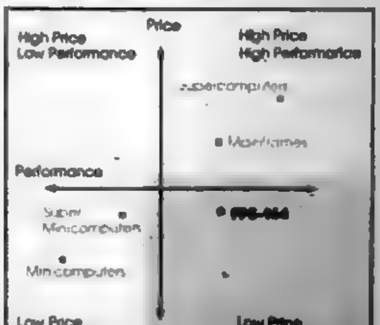

Solutions Using Sparse Matrices

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Many scientific and engineering applications use sparse matrix methods in their problem solving. The FPS-164 is especially suited for these operations which can account for up to 95% of the CPU time.

Provides Net Capabilities

CAD/Drafting Line Bows

ARMONK, N.Y. — Information Displays, Inc. has introduced a family of stand-alone computer-aided design (CAD)/drafting systems.

The Cadalyst 200 series reportedly provides networking capabilities and potential for expansion. Its 32-bit parallel processing architecture employs seven independent processing subsystems, each with its own local program and data storage facility, the vendor said. Each Cadalyst unit, supporting up to 16M bytes of addressable memory, features both vector-refresh and color raster displays, light pen or data tablet, streaming magnetic tape drive and Winchester technology disk with fixed/removable media, according to the vendor.

Prices for this system start at under $100,000. Further details are available from the vendor at 28 Kaysal Court, Armonk, N.Y. 10504.

Wang VS Mini, IBM 6670 Link Out

NEW YORK — LBM Software Corp. has released a series of telecommunications interfaces that reportedly link the Wang Laboratories, Inc. VS minicomputer and the IBM 6670 laser printer.

The packages enable the following connections:

- Wang VS/IBM Model 6670 interface.
- Wang OIS/IBM Model 6670 interface.
- Wang VS/Xerox Corp. Model 5700 interface.
- Wang OIS/Xerox Model 5700 interface.
- Wang VS/Xerox Model 2700 interface.

The software is sold on a per-CPU, one-time license basis for $7,500 for dual-mode Wang VS-related packages, and $5,000 for single-mode Wang OIS-related packages from 251 Park Ave. S., New York, N.Y. 10010.

Printer Fits Diablo, Qume

MELBOURNE, Fla. — A printer with a Diablo/Qume parallel interface has been added to Florida Data Corp.'s Office Systems Printers (OSP) family.

The OSP-125's interface reportedly will allow it to operate on systems with either the Diablo Systems, Inc. Hytype II or the Qume Corp. Sprint III printers.

The unit produces draft copies at 600 char./sec, non-letter quality at 150 char./sec and letter quality copies at 100 char./sec. Multiple font storage of four fonts is standard with optional capability for 10 resident fonts, according to a spokesman for the vendor.

The OSP-125 costs $4,300 from 600D John Rodes Blvd., Melbourne, Fla. 32935.

Diskette Version Of S/10 Released

ALBUQUERQUE, N.M. — MAI/Basic Four Business Products Corp. has announced a single diskette drive version of its S/10 small business computer.

The S/10 computer handles a number of general business applications including accounting, general ledger, accounts receivable, accounts payable and payroll, the vendor said. It can run on the Digital Research, Inc. CP/M operating system as well as the vendor's proprietary Business Basic/Micro.

The single-drive S/10 system has a base price of $3,995. Further details are available from the vendor at 601 San Pedro N.E., Albuquerque, N.M. 87108.

Printer Prices Reduced $600

FORT LAUDERDALE, Fla. — Southern Systems, Inc. has announced a $600 price cut on its Data General Corp.-compatible printer systems using the data channel controller.

New prices are currently down to $3,500 to $60,000, depending on the line printer speed required, the vendor explained. These printers reportedly range in speed from 55 line/min to 5,280 line/min. Print technologies include matrix, band and non-impact technology

Further details are available from the vendor at 2841 Cypress Creek Road, Fort Lauderdale, Fla 33309.

Data I/O Introduces Programming Module

REDMOND, Wash. — Data I/O has announced a programming module that is claimed to program over 400 devices under software control

Unipak 2 programs programmable read-only memories (Proms) of all bipolar fuse technologies, metal oxide semiconductor (MOS) Proms, MOS erasable Proms (Eproms) and MOS Eproms. The package is compatible with the company's 29A, 100A and System 19 universal programmers.

The module needs only four-digit codes to select correct algorithms, the spokesman said. Intelligent algorithms eliminate redundant programming pulses by checking memory cells after each pulse.

The product costs $2,350 from 10525 Willows Road N.E./C-46, Redmond, Wash. 98052.

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For example, a FORTRAN program performing a common sparse matrix operation ran 6 times faster on the FPS-164 than on a popular scientific super-minicomputer. When the program was modified to take advantage of the FPS-164 architecture, the sparse matrix operation ran over 14 times faster than on the super-minicomputer.

The FPS-164 is presently being used in applications such as computational chemistry and physics, structural analysis, finite element analysis, oil reservoir modeling, and electronic circuit design.

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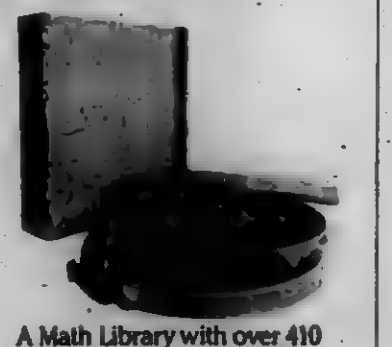

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*1981 Datamation Brand Preference Study of the Data Processing Industry, OEM and End-User Markets. Infosystems Magazine, 1981 Survey of Terminal Usage. 1982 Brand Preference Survey conducted by Data Communications Magazine.

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Boasts 1,500 Line/Min

Controller Out for HP 3000

MENLO PARK, Calif — BDS Corp. has introduced a microprocessor-controlled printer system that reportedly gives users of Hewlett-Packard Co.'s HP 3000 series minicomputers printing speeds of up to 1,500 line/min.

Designated the HPC-33LL, the controller includes a Zilog, Inc. Z80 microprocessor and an Intel Corp. 8291 talker/listener for interfacing with the general-purpose interface bus. It also includes associated memory and logic circuits, a spokesman for the vendor said.

The price range of these printers is $8,700 to $25,000, according to the spokesman for the vendor.

The printer system is available from BDS Corp., which is located at 1120 Crane St., Menlo Park, Calif. 94025.

Impres Unveils Graphics System

AUSTIN, Texas — A recently formed computer graphics company called Impres, Inc. has announced one of its first computers, the Impres System 500.

Aimed at the computer-aided design and manufacturing market, this turnkey product reportedly enables users to scan drawings or documents to edit, modify or enhance the resulting image.

System 500 offers drafting features, including templates of components, multiple levels and automatic dimensioning, the vendor said. The system is base priced at $40,000, the vendor said from 3303 Northland Drive, Austin, Texas 78731.

Supraminis Get Price Reduction

IRVINE, Calif. — Prices have been reduced by 19% on Polycomputers, Inc.'s low-end multiprocessing, virtual memory Supramini product line.

These systems reportedly offer three processors, 576K bytes of metal oxide semiconductor memory, 34M bytes of Winchester mass storage disk, a four-line multiplexer, high-speed printer controller, ¼-in. cartridge tape drive and the vendor's proprietary Vmos operating system, a spokesman said.

The systems list for $29,950, according to the spokesman.

Polycomputers can be reached at 18003-L Sky Park S., Irvine, Calif. 92714.

Power System Out for Minis

GARDENA, Calif. — Computer Power Products has introduced a Rotary Uninterruptible Power System for minicomputers in the 12 kVA to 50 kVA range.

The Mini-Rups eliminates sags, surges, brownout and blackout conditions that interfere with proper computer operations, the vendor claimed.

It also eliminates problems resulting from short-duration high-voltage transients, momentary outages caused by commercial utilities, network feeder switching and power-factor correction switching, according to the vendor.

To resolve blackout problems when commercial power is lost, the Mini-Rups supplies power to the load using the energy stored in batteries, the vendor said.

Prices for the Mini-Rups begin at $22,000.

More information is available from Computer Power Products, 227 E. Compton Blvd., Gardena, Calif. 90248.

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IBM Computer-Controlled Robotic System Out

BOCA RATON, Fla. — A computer-controlled robotic system intended for electronic component insertion, precision mechanical assembly, testing, light fabrication and material handling, which is said to respond to changes in its work environment, was announced here by IBM.

The IBM 7565 Manufacturing System reportedly combines an IBM Series/1 computer and a robotic arm that can be moved in up to six directions within its frame. Position and operation of the arm are monitored by the computer 50 times each second, under the control of the A Manufacturing Language (AML), the vendor said.

The 7565 system also features data communications and I/O capabilities that assist in interfacing the system with a number of automated manufacturing processes, according to the vendor. Data processing functions reportedly can be used to maintain production records and generate management reports, an IBM spokesman explained.

Available in three models with up to six degrees of freedom, the hydraulically powered system can be equipped with a servo-controlled gripper than can actually "feel" parts and tools in its work area. The optical and tactile sensors that enable this function provide feedback to the system's computer, allowing the 7565 to respond to changes and different stimuli, the vendor said.

The IBM 7565 Model 003 offers three linear motions with speeds up to 40 in./sec, and can carry up to 16 lb. The Model 004 has the same linear motions plus one rotary motion, or yaw, with a payload of up to 13 lb. The Model 006 combines the three linear motions with three rotary motions — toll, pitch and yaw. It reportedly handles up to 8 lb, with rotary motor speeds pf 60 degree/sec.

A typical configuration featuring the Model 003 is priced at $80,000, while pricing for the Model 006 starts at approximately $100,000. Further details are available from IBM's System Products Division, 1000 N.W. 51st St., Boca Raton, Fla. 33432.

Power System Introduced

MIDDLETOWN, N.Y. — An uninterruptible power system (UPS) from K/W Control Systems, Inc. is said to combine motor and generator windings in the same housing with a common rotor.

The Piller Uniblock UPS' rotating power conditioner is said to reduce mechanical energy losses associated with traditional motor generator designs. Other features include dual power paths for built-in redundancy, a simple commutator for reported reliability, fault-clearing capability, nonstatic bypass and off-line battery.

Systems range from 40 KVA to 500 KVA, with batteries typically ranging from 5 minutes to 15 minutes. A 60-KVA unit with a 15-minute battery costs $64,000, a spokesman said from S. Plank Road, Middletown, N.Y. 10940.

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PC Lock Bows For IBM Micro

NORTHBROOK, Ill. — A firmware password protection program for the IBM Personal Computer has been developed by MPPI, Ltd.

PC Lock provides a user with a unique password, without which programs cannot be loaded, diskettes cannot be read or copied and data cannot be entered or updated. PC Lock reportedly will work with any operating system.

With a randomly selected password, PC Lock costs $99; with a custom password, it costs $149; installation is $15. The vendor is located at 1126 Adirondack, Northbrook, Ill. 60062.

R & B Offers DEC Micros

TEMPE, Ariz. — R & B Computer Systems, Inc. has made available Digital Equipment Corp.'s personal computer line: the DEC Rainbow 100, the Decmate II and the Professional 300 series.

R & B plans to integrate its own proprietary software with the DEC equipment, according to the vendor. The vendor is offering the above-mentioned equipment at prices starting at $4,160, $4,460 and $4,750, respectively.

Further details can be obtained from R & B at 648 S. River Drive, Tempe, Ariz. 85281.

'Repair? Our Computer Just Sprung a Leak!'

Portable Fiche Reader Offered

SAN DIEGO — Datagraphix, Inc. has announced Micromate, a portable microfiche reader.

The unit reportedly combines the portability of a personal-size reader with features found in larger desktop units. Features include a constant-focus floating lens and a dual-lens option, which enables the operator to interchange lens elements for viewing computer-output microfiche or source document microfiche data, the vendor said.

The Micromate costs $249, the vendor said through P.O. Box 82449, San Diego, Calif. 92138.

Package Turns IBM Micro Into Design Workstation

CANOGA PARK, Calif. — A package that reportedly turns the IBM Personal Computer into an electrical engineering workstation has been unveiled by Futurenet, Inc.

The Dash 1 system consists of software, a proprietary graphics controller, a memory network interface card and a printer plotter. All of this is added to a standard IBM Personal Computer, a spokesman said.

The Futurenet Dash 1 is created to automate the design of systems composed of integrated circuits and other discrete components.

The complete system is priced at $12,960, $5,960 if the user already has an IBM Personal Computer and printer. Further information is available from the vendor at 21018 Osborne St., Unit 5, Canoga Park, Calif. 91304.

UPS Targets Micros, Minis

ANAHEIM, Calif. — General Power Systems, Inc. has introduced 300W and 500W on-line uninterruptible power systems designed for micros and minis.

The GPS-3000 and GPS-5000 series operate from 120V ac, 60Hz and 240V ac, 50Hz utility power lines, respectively, with backup provided by a 60V dc standby battery.

Options include static switch, RS-232 port for computer interfacing, additional batteries, rack or standard enclosures and various input voltages and frequencies. The GPS-3006 costs $1,250 and the GPS-5006 costs $1,550. Those models provide 10 minutes of full backup, a spokesman said from 1400 N. Baxter St., Anaheim, Calif. 92806.

Matrix Printer Targets Micros

NASHUA, N.H. — Facit/Dataroyal, a division of Facit, Inc., has announced the 4510 dot matrix printer.

Designed for small business applications involving personal computers, the 4510 features three-way paper handling, a multifont capability, a 2K-byte buffer and both parallel and serial interfaces, the vendor said.

The unit costs $695, the vendor said from 235 Dunstable Road, Nashua, N.H. 03061.

Graphmate Plots Color Graphs

SHENANDOAH, Ga. — A standalone four-color graph plotter that can reportedly be programmed after only 30 minutes of training has been announced here by Yokogawa Corp. of America.

The Graphmate can plot bar charts, pie charts and line graphs from simple keyed commands and data entry, according to the vendor. Programming is performed on a standard alphanumeric keyboard from instructions displayed on an LCD screen, the vendor said.

The plotter retails for $2,800. Further details can be obtained from the vendor at 2 Dart Road, Shenandoah, Ga. 30265.

Color Graphics Out for Tandem

NEW YORK — Progressive Systems, Inc. (PSI) has introduced a color graphics capability for Tandem Computers, Inc. computers.

The Color Graphics line includes a high-resolution Color Graphics Terminal for $6,495, a Color Graphics Ink Jet Printer for $6,995 and PSI's Graf-Flex software for $10,000.

The Graf-Flex software is said to translate pages of numbers into color-coded charts and graphs for nontechnical people. The terminal reportedly can display more than 4,000 colors.

PSI is located at 80 Broad St., New York, N.Y. 10004.

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CW 0214

Power System, Conditioners Out

SAN DIEGO — Topaz, Inc. has introduced a computer-room power distribution system as well as a line of microcomputer-controlled power conditioners for guarding against problem-causing voltage variations and power-line noise.

The Maximum Value Powercenter (MVP) reportedly uses watertight shielded cables to distribute safely ac power throughout a computer room. These cables allow users to arrange and rearrange computer equipment without the inconvenience of fixed-wire installations, according to the vendor, and additional cable assemblies can be installed for expansion.

The MVP also offers power-line noise suppression. The product is 97% power efficient and is available in power ratings of 100, 125 and 150 kVA, the vendor claimed. Prices start at approximately $12,000.

The three-phase power conditioners simultaneously announced by the company feature powerlogic, a microcomputer technology that reportedly increases the speed and accuracy of the power conditioning process. An internal microcomputer continuously monitors the input voltage so that if a significant fluctuation occurs, the microcomputer determines the amount of correction necessary and initiates the proper response.

This product is available in 50-Hz and 60-Hz models, and in power ratings of 10 kVA to 100 kVA. Their prices begin at $6,950.

Topaz is at 3855 Ruffin Road, San Diego, Calif. 92123.

Printer Controllers Debut For Series/1, System/34, 38

STAMFORD, Conn. — Digital Associates Corp. has announced two printer controllers for IBM Series/1 and System/34 and System/38 processors.

In the past, the controllers were only offered as part of the firm's printer subsystems. The controller for the Series/1 allows users to use different vendors' line printers operating at speeds up to 2,000 line/min. The interface for both IBM's System/34 and System/38 processor provides more options to IBM users than similar controllers offered by IBM, the vendor said.

The Series/1 printer controller costs $1,995. The combination System/34 and System/38 controller costs $1,695 from 1039 E. Main St., Stamford, Conn. 06902.

Unit Protects Most Minis

SANTA ROSA, Calif. — Sentec Corp. has announced the System II, a power protection system for most minicomputers.

The unit reportedly protects minicomputers from 40% to 80% of failures resulting from fault conditions in the power line. The unit monitors, and reacts to, overheating, power line transients, multiple power interrupts, power-switching transients, humidity, airborne particulates, phase loss, brownouts and power line fluctuations, the vendor said.

System II has three-phase 120/208 Vac, 50 Hz or 60 Hz. The unit is rated at 75A/phase and has 360kW high-energy suppressor, the vendor said.

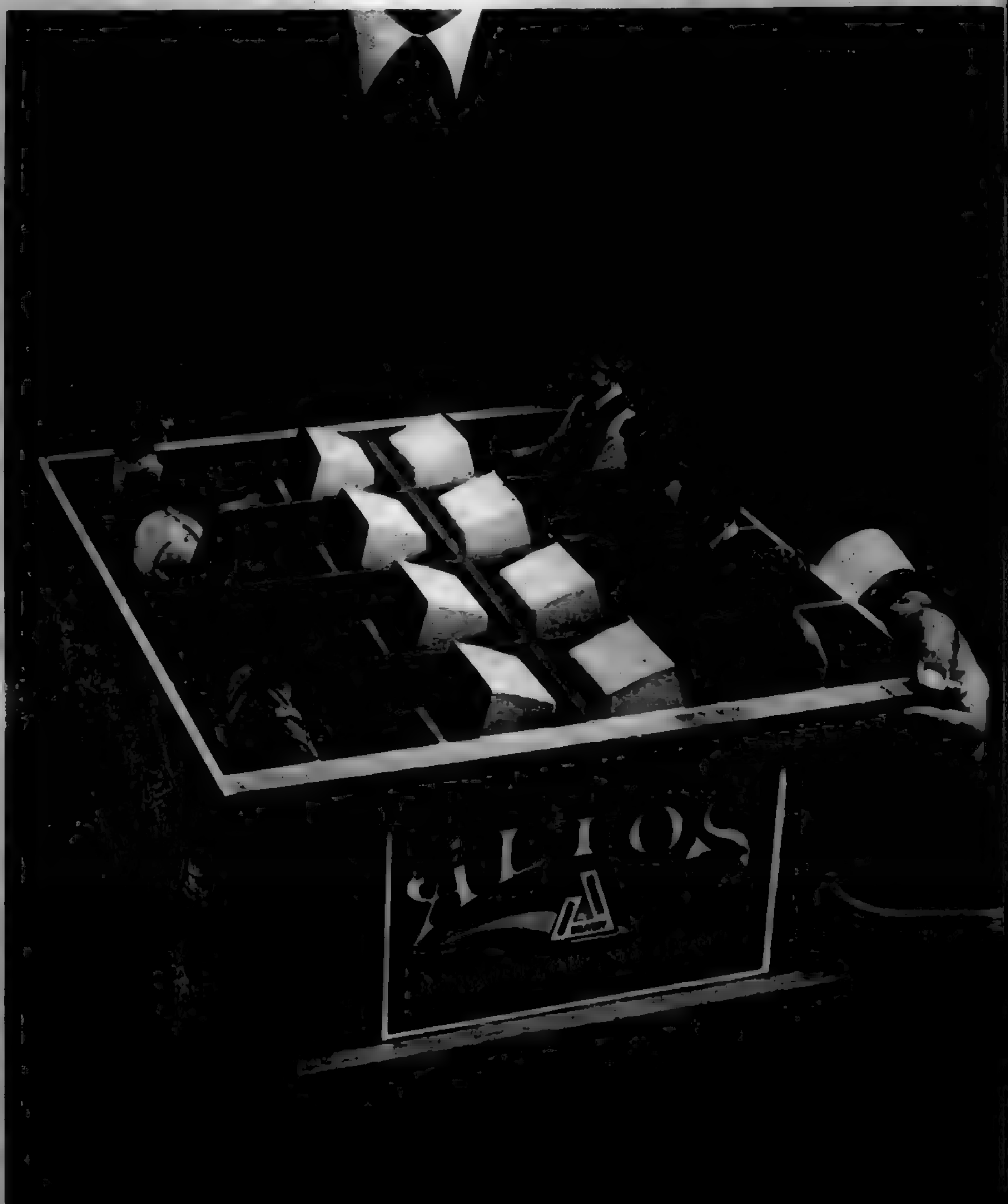
The unit costs $15,300, the vendor said from 2841 Cleveland Ave., Santa Rosa, Calif. 95407.

Link Extends Alphaword

FAIRFIELD, N.J. — Compuscan, Inc. has announced an interface between its Alphaword III optical character reader and Mitron Systems Corp.'s nine-track tape drive.

The Alphaword III scans and inputs typewritten pages into the Mitron tape drive. The Mitron tape drive, in turn, records the information on nine-track magnetic tape said to be compatible with computers manufactured by IBM, Digital Equipment Corp., Data General Corp. and Hewlett-Packard Co.

Alphaword III is base priced at $29,500 from 11 Two Bridges Road, Fairfield, N.J. 07006.



Bits & Pieces

Pebx Reduces Price On DEC Q-Bus System

CAMPBELL, Calif. — Pebx has announced a price reduction on its MeccV11 memory system for the Digital Equipment Corp. Q-bus.

The price of $895 includes 256K bytes of error-checking and correcting memory and battery backup operating off a 12V lead-acid battery; the vendor said.

Using a Hamming code, the error-correcting logic generates five check bits for each 16-bit word. The additional random-access memory (RAM) is contained on the board.

Single-bit errors are automatically corrected and LEDs on the controller board point to the offending RAM. That RAM may be replaced during regular preventive maintenance on systems, the vendor said.

Further information can be obtained from the vendor, which is located at 501 Vandell Way, Campbell, Calif. 95008.

Keyboard Introduced For IBM Micro Users

SPOKANE, Wash. — Key Tronic Corp. has introduced a keyboard that is plug-compatible with the IBM Personal Computer.

The P2402-19 features a sculptured nonglare finish keytop with double-shot molded keys, low profile — 30mm from desktop to home row — full key travel with positive tactile feedback, microprocessor electronics, solid-state capacitance switches and a cable for detached portability and operator comfort, a spokesman for the vendor said.

The keyboard is priced at $235, according to the spokesman.

It is available from the vendor through P.O. Box 14687, Spokane, Wash. 99214.

Tape Degausser Debuts From Christie Electric

TORRANCE, Calif. — Christie Electric Corp. has unveiled the Christie Maxerase-16 Degausser.

The Maxerase can reportedly erase computer tapes in 30 seconds each on a continuous production basis and features an enhanced duty cycle for long-term operation without overheating. It also has switch-selectable high and low power settings and an override switch to complete a degaussing run should the flux erasing coils overheat, a spokesman said. spokesman.

Priced at $6,500, Maxerase is available from the vendor, which is located at 20665 Manhattan Place, Torrance, Calif. 90501.

Board Module Expands IBM Micro's Memory

SAN JOSE; Calif. — A microcomputer board module that reportedly expands the capacity of the IBM Personal Computer has been unveiled here by Hurricane Laboratories, Inc.

Called Nirvana, the product contains multiple function blocks and occupies just one slot on the IBM micro's I/O channel.

This means users can expand the capabilities of their Personal Computers with up to 640K bytes. of memory. Nirvana is priced at $995, the spokesman for the vendor said from Suite 105, 5149 Moorpark Ave., San Jose, Calif. 95129.

CAD/CAM Users Get Isolation Transformers

COSTA MESA, Calif. — Emergency Power Engineering, Inc. has announced a line of isolation transformers designed for use with most processing and computer-aided design and manufacturing systems.

Designed to reduce power-line noise for a variety of applications, the units come in two models — Computer Grade and Ultraguard. The Computer Grade units provide standard noise protection, while the Ultraguard models offer more noise protection along with a lightning arrester and surge suppressor, the vendor said.

Computer Grade isolation transformers cost between $1,500 and $17,000. Ultraguard units cost between $2,400 and $21,000, the vendor said from 3580 Cadillac Ave., Costa Mesa, Calif. 92626.

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Long-Range Planning Needed

Consultant Warns Against PBX Claims

By Jim Bartimo
CW Staff

NEW ORLEANS — As private branch exchanges (PBX) take on more and more applications — office automation, local-area networking and data communications — users must become increasingly wary of vendor claims, consultant Edward Horrell warned here at the recent Communication Networks Conference & Exposition.

Contrary to what many vendors believe, many businesses will not buy an advanced PBX for networking and office use right away, Horrell, president of Mitchell & Horrell, Inc., maintained. That gives users a chance to position themselves for the increased use of PBXs, he said.

This positioning can take place only through long-range planning as the user upgrades his PBX step by step and evaluates several areas. One of these areas is the number of ports available on the switch, which determines how many new applications can be tried.

Horrell cautioned, however, that the number of available ports and the number of actual ports are often different. "There's no way of knowing how many ports there are. It all depends on the vendor," he said.

CW Photo by J. Bartimo

Edward Horrell

Other areas of concern for users of growing PBXs are the physical facilities available and cabling. Two sets of twisted-pair wire, one for voice and one for data, are often pitched as an integrated voice and data network. "Don't fall prey to a lot of assumptions the vendors will try to sell you," Horrell said.

Increasingly complex terminal devices may offer another problem for the communications manager because not all terminals will be compatible with the PBX network. "Don't think you can just plug a terminal in because it has an RS-232C interface," Horrell advised. "And don't assume that all terminals have an RS-232C port. If you try to connect an [IBM] 3270 emulating terminal, you'll get nothing."

The amount of memory available on various PBXs is also an area that blurs from vendor to vendor. While one vendor may have more memory resident on the system, it may be unavailable to the user because the software is poorly written. "Don't just ask and compare memories," Horrell said. "Find out how much memory you're buying, how much you'll be able to use and how much you'll need to get into office automation."

Other questions the user must ask in order to position himself better for increased PBX use include:

- What kind and how many applications are going to be installed?
- Will the service the vendor provides be adequate? How long can the business tolerate a system failure?
- Because there is little security available in the PBX market, how important is it to your business?
- Is centralized power your goal or will local power suffice?
- How much traffic will there be on the system?

"As an industry, communications professionals are hard-dollar specialists, not planners," Horrell said. "We've got to become as interested in long-range planning as we are in cost-justification."

But long-range planning means more than just taking vendor projections at face value because "the line we're getting is a lot of hype," Horrell contended.

Lifeboat Associates Announces WP Aid

NEW YORK — Lifeboat Associates has introduced a word processing aid designed to produce professional quality printouts.

Magicprint permits proportionally spaced printing on any microcomputer using the vendor's SB-80 operating system or Digital Research, Inc.'s CP/M operating system and a daisywheel printer. The program allocates character spacing based on the actual width of large or little characters.

It also offers footnoting capabilities, four printing modes and 50 formatting capabilities, the vendor claimed.

The program is available for $195 from Lifeboat Associates, 1651 Third Ave., New York, N.Y. 10028.

AB Dick Introduces Packages For Magna III, Magna-Writer

CHICAGO — AB Dick Co. has introduced two software packages designed to enhance workstation multifunctionality for its Magna III and Magna-Writer information processing systems.

The two packages, created for Digital Equipment Corp. VT52 terminal emulation and Sorcim Corp.'s Supercalc, are both based on Digital Research, Inc.'s CP/M operating system and provide word and data processing capabilities for general business and education applications.

Serving as a generic communications device, the DEC VT52 terminal emulation software reportedly operates asynchronously with virtually any mainframe for a variety of applications. Supercalc is a comprehensive spreadsheet and report generator package that allows a large electronic work sheet to be created with the ability to accept and modify text and formulas.

Suggested retail price for the DEC VT52 terminal emulation package is $300; Supercalc costs $295. Both packages are used with optional Magna III and Magna-Writer capability, priced at $300, from AB Dick, 5700 W. Touhy Ave., Chicago, Ill. 60648.

Displayphone Price Slashed 20%

NASHVILLE, Tenn. — Northern Telecom, Inc. has announced a 20% price reduction for its Displayphone terminal. The new single-unit price is $1,595, down from $2,000.

Displayphone is a combination desktop telephone and data terminal that can simultaneously transmit and receive voice and data communications. It features a retractable keyboard, display screen, automatic dialing and directory memory.

All new orders placed after Jan. 24, as well as orders pending, will carry the new price list. The new price applies only to sales in the U.S.

Northern Telecom is located at 259 Cumberland Bend, Nashville, Tenn. 37228.

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Crime Agency Arrests Backlog With WP System

TRENTON, N.J. — The New Jersey Division of Criminal Justice here used a word processor to turn a backlogged paper-intensive record and indexing operation into a flexible case tracking system. It has also realized enough savings from text editing uses to pay for the word processors within a year.

Edwin H. Stier, the director of the New Jersey Division of Criminal Justice, indicated that timely management information is essential for the functions the division handles for the attorney general: It supervises the state's law enforcement community, and it investigates and prosecutes criminal offenses of statewide significance. To allow the attorney general and division administrators to monitor pending cases, the division set up an index and a cross-reference system and a series of periodic case lists.

These records were maintained manually, according to Frank Bellis, chief of the Information and Records Management Section. "A clerical worker would read a memo from a lawyer or investigator, look for the docket sheet by case number, make the status change on the sheet and put it back into the file," he explains.

Even more time-consuming than the file searches were the entries, which had to be made at least four times. When the division took on a case, it was first typed on the weekly new-case list. The same entry would also go on the major-case list, the 45-day report, one of several section lists and a cross-reference card.

Recognizing that the division could not continue a manual records system, Stier assigned the Information and Records Management Section to study the problem and design a solution.

By 1978, the system was beginning to strain under a growing case load. "We kept adding more people and the case lists got longer and longer," Bellis recalled. When the list was finally distributed after days of typing, it often was already out of date. "In our type of work that was useless," comments Bellis. "We couldn't use the information as a management tool because we'd get it stale."

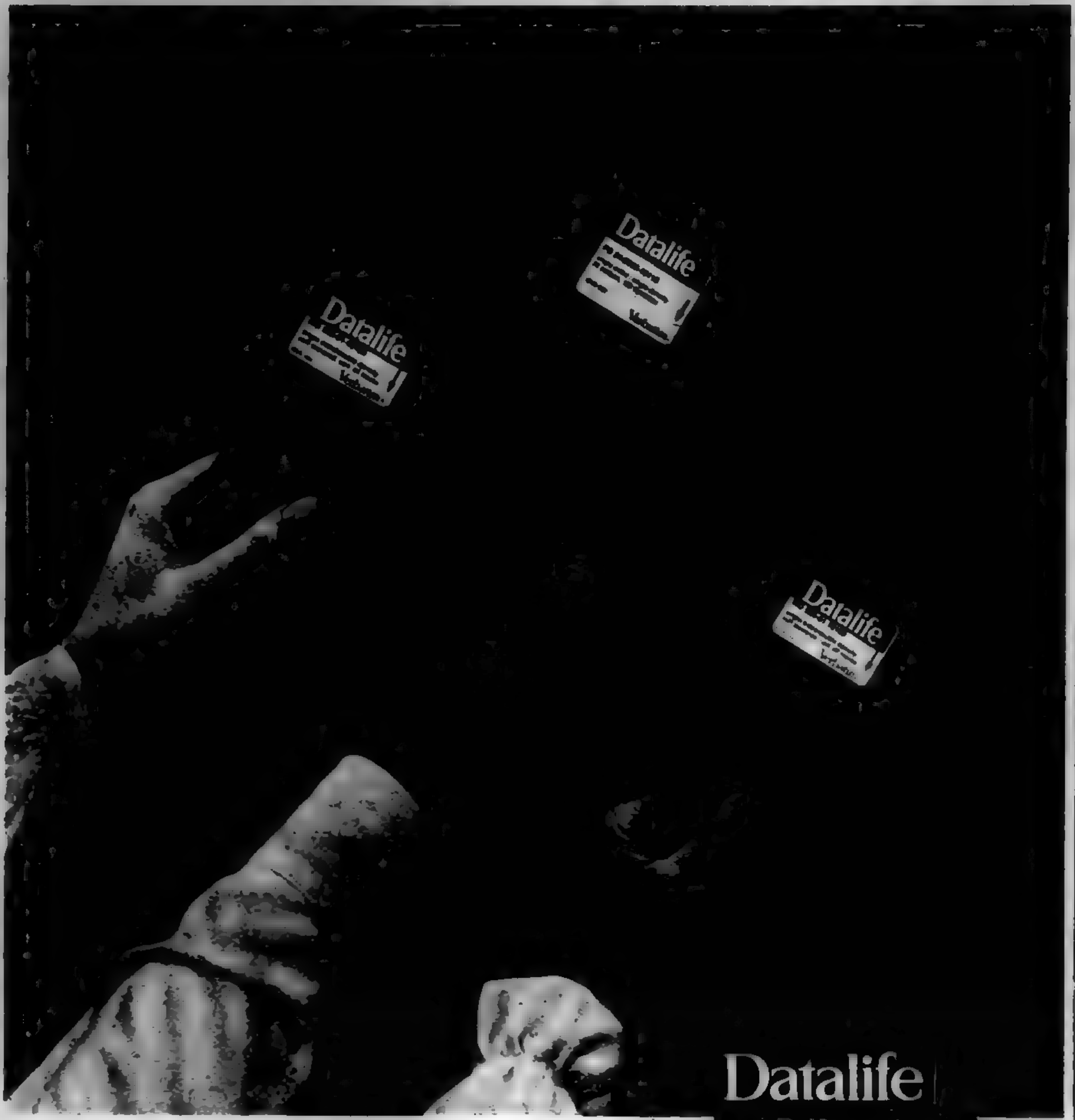
Promising Path

Word processing offered the most promising path to automation — the only reasonable solution. "We needed a self-contained system because of the sensitivity of the information," Bellis noted, "and the cost of computers was prohibitive at the time." Several manufacturers were asked to show how their equipment would process case lists. Bellis said, "Wang [Laboratories, Inc.] was head and shoulders above everyone else, mainly because of the size of the disk in the Wang system and the way in which the information on the disk can be accessed and moved."

Meanwhile, the Appellate Section, also in the Division of Criminal Justice, faced with a growing number of appeals in state and federal courts, decided to install word processing systems to speed up preparation of appellate briefs. These documents often go through several revisions and, Bellis said, "because of court-imposed deadlines, there's real pressure to get the work done."

A single Wang WP System 30 for both sections proved the most cost-effective solution. The basic configuration included a central processor with a 10M-byte disk, 4,000 pages of on-line text and an archive diskette. The Records Section was assigned two workstations and a printer. A password system protects its confidential data. The Appellate Section installed eight terminals and two daisywheel printers, each equipped with a twin sheet feeder.

"With the quick turnaround that word processing gives you in drafting," Bellis noted, "pressure on the legal and clerical staff has been dramatically reduced."



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To U.S. Semiconductor Industry

SIA Documents 'Proof' of Japanese Harm

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The U.S. semiconductor industry has produced what it terms "irrefutable" proof that U.S. chip makers have been seriously harmed by an unfair and illegal Japanese government program to protect and support its native semiconductor industry.

The Semiconductor Industry Association (SIA) sought to document its charges in a voluminous study, entitled "The Effect of Japanese Government Targeting on World Semiconductor Competition," which was released here Feb. 3. In it, the association described how a closed Japanese market and Japanese support of its firms' exports have violated international trading treaties and, in the words of SIA Chairman Robert Noyce, "destroyed the profitability of the [American] industry."

Noyce, vice-chairman of Intel Corp., and Jerry Sanders, chairman of Advanced Micro Devices, Inc., told a press conference here that the study, which proposes a six-point plan to counter such foreign government targeting, backs the charges the U.S. firms have been making against the Japanese for the last five years. The SIA presented its arguments to Commerce Secretary Malcolm Baldridge as part of the government's study of the competitiveness of U.S. high-technology industries.

Detailing the charges in the SIA document, Sanders said that the Japanese, through government subsidies, government directed and supported research and development cartels, directed loans and a protected domestic market, have allowed Japanese firms to dominate the American and Japanese markets for 16K and 64K random-access memory (RAM) chips.

Dominance of this high-volume market has severely damaged the profitability of U.S. firms, which in turn threatens their ability to invest in R&D and new capacity for succeeding generations of semiconductors. Based on confidential American firm data, the SIA said the U.S. semicon-

(Continued on Page 124)

Northern Telecom to Continue U.S. Market Thrust: Chairman

By Bill Laberis
CW Staff

BOSTON — The greatest challenges to the U.S. telecommunications industry for market supremacy will continue to come from across the border.

Having closed out 1982 with record revenues and earnings, Northern Telecom Ltd. of Canada is targeting the U.S. market as its hottest growth area, according to Walter F. Light, the company's chairman and chief executive officer.

Speaking to the Boston Society of Security Analysts here recently, Light said that 48% of the company's $3 billion 1982 revenues came from U.S. sales, compared to 41% in 1981. "The proportion of our revenues recorded in Canada and the U.S. is now almost exactly reversed from 1981," Light noted. "Five years ago Canada represented 64% of our total revenues."

The timing and rate of economic recovery in the U.S. — and the lack thereof in Canada — will play a significant role in company strategy this year, Light said, projecting that between 55% to 60% of company revenues will be earned in the U.S. in 1983.

"Anytime you feel depressed about the recession in the U.S.," Light told the analysts, "I invite you to visit Canada. By comparison, the weak performance of the U.S. economy looks pretty good."

Canada's 9.3% inflation rate and burgeoning 12.8% unemployment rate caused Canadian telephone companies, including Bell Canada, to reduce capital spending last year, Light explained. This recessionary phenomena bit deeply into Northern Telecom's revenues there, he said.

Nonetheless, sales in the U.S. and Europe enabled profits to climb 25.3% to $151.2 million or $4.30 per share. Revenues were up 18%, topping the $3 billion mark for the first time.

Fourth-quarter results showed revenues up 11% to $788 million and earnings up 7.5% to $39 million, or $1.10 per share.

(Continued on Page 122)

Profile of a 'Devout Pragmatist': Dialogue With PE's McDonell

By Bill Laberis
CW Staff

NORWALK, Conn. — Horace G. McDonell never set out to be president of a major corporation, anymore than he intended to take a physics course his first year at college.

"I was going through the registration line, trying to find an easy way around the laboratory science requirement at Adelphi," Perkin-Elmer Corp.'s president and chief operating officer recalled of his first day at college. The biology classes were closed out, as were the chemistry classes. So he settled for his last choice, physics.

"That's how I became a physicist . . . It was a chance event. It turned out I liked physics, and I just followed my nose from there," McDonell said during a recent interview at his modest office here. "I can name a couple of other critical turning

(Continued on Page 120)

Horace G. McDonell

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Inman Defines Goals of Fledgling MCC Venture

By Jim Bartimo
CW Staff

ARLINGTON, Va. — "There will be four major projects," said Bobby R. Inman, newly appointed head of the Microelectronics and Computer Technology Corp. (MCC).

Inman, a former deputy director of the Central Intelligence Agency and former director of the National Security Agency, defined some of the goals of the fledgling joint computer research venture in an interview here recently. The brainchild of William Norris, chairman of Control Data Corp., MCC is a consortium of high-tech companies designed to "try to preserve U.S. preeminence and predominance in the microelectronics and computer field." [CW, Jan. 31].

According to Inman, the four research projects will include: the Alpha-Omega to develop an advanced computer architecture; another project targeting the development of software; a third project focusing on integrated circuit packaging; and a fourth on computer-aided design and manufacturing.

The structure of the organization will be such that each of the 10 subscriber companies, with more likely to be added, will contribute to one of the projects. While each project may take several years to reach fruition, "contributors will have a three-year lead [over other companies in implementing the developed technology]. That has the blessing of the Justice

(Continued on Page 122)

PE's McDonell Describes Rise to the Top

(Continued from Page 117)

points of similar nature. It was just which way the ball happened to bounce.

"But, the ball having bounced," McDonell continued, "the important thing was pick it up and do something with it."

A self-described "devout pragmatist," McDonell, 55, is something of an anomaly in an industry where few gold watches will ever be handed out. He has been with PE for 31 years, starting as a marketing representative when the company grossed less than $5 million annually and picking his way through the management ranks to the top of what has become a billion-dollar-plus minicomputer and instruments maker.

McDonell's rise to the top was marked at each turn by a willingness to adapt to conditions in the electronics and computer markets that changed, he said, almost before his eyes. The dynamic market conditions persist; PE's Data Systems Group is the fastest growing segment of the company, accounting for over one-third of total revenues and profits.

Asked at a recent users group how committed the company is to the computer business, McDonell replied, "Perkin-Elmer is becoming a computer company."

Lately, however, the company's growth has been buffeted by recessionary ill winds. In 1982 it reported its first earnings dip in 25 years, and another sizable drop was entered for the first quarter of fiscal 1983. The company's Semiconductor Equipment Group has been hit hard by the price and earnings erosion prevalent in the semiconductor industry. Sales of 32-bit superminicomputers, the Data Systems Group's mainstay, have not proved adequate to bolster sagging computer revenues caused by continuing economic doldrums.

Nonetheless, McDonell is confident that PE will prosper in the long term because of its commitment to product quality and precision, a commitment he said was forged when the company was primarily an instruments business. McDonell hopes to direct PE's divisions to capitalize on the migration of technological expertise from something like the company's instruments know-how to development of business systems and vice versa.

While acknowledging that the mini market is squeezed on the low end by increasingly more powerful, microprocessor-based machines, a wholesale commitment to the mass-distribution microcomputer market — notwithstanding the moves of IBM, Digital Equipment Corp. and others — is not a part of McDonell's strategy. "I do not envision Perkin-Elmer getting into the mass distribution, Computerland or Radio Shack-type of channels," he said.

However, microprocessor technology "is, in fact, driving us into the small computer business again." The microcomputer market, McDonell speculated, will "segment itself very rapidly, just as the minicomputer market did before."

Thus, McDonell hinted that PE's future microcomputer thrust may be directed toward the scientific and technical markets it already serves.

"The rapidity of change in the computer business is incredible," McDonell pointed out. "Not everyone is smart enough to predict where that change is going to take us. But I think you have to be reactive as hell to have any hope of keeping pace."

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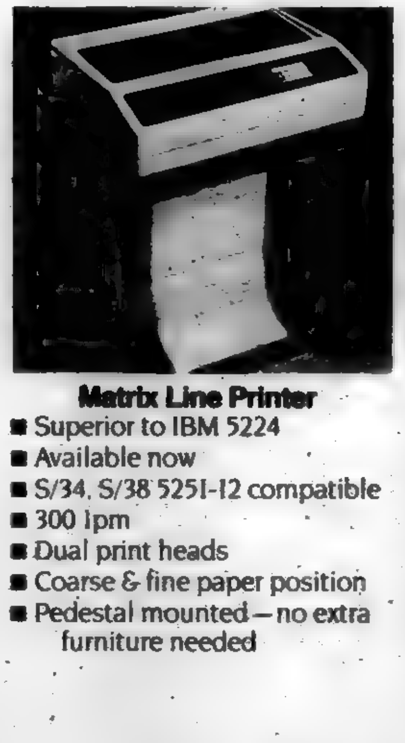

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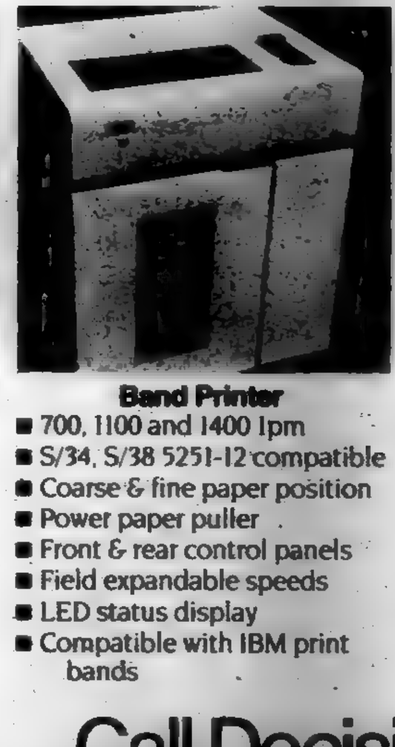

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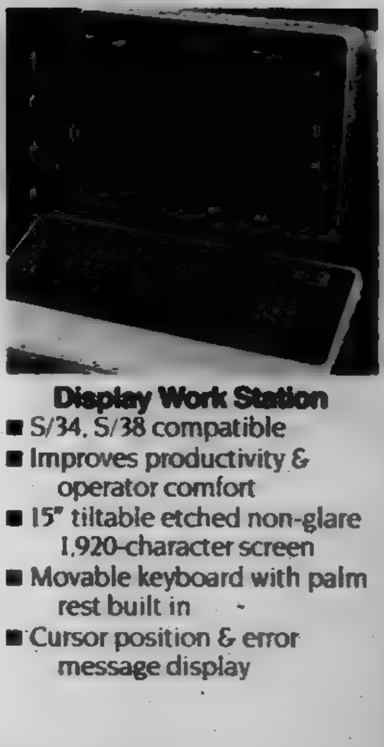

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'Atlantic' DPers Warned of Resting on Laurels

By Bob Johnson
CW New York Bureau

NEW YORK — American and European information workers cannot "sit down and relax" over their past accomplishments in computer technology, according to Philippe Dreyfus, vice-chairman of Cap Gemini Sogeti, a French computer services company.

Speaking to information processing executives here recently about the evolution of DP in the next 10 years, Dreyfus emphasized that although the U.S. has contributed the bulk of development in information processing and that Europe has made major advances in videotex and teletext, this "Atlantic" alliance must not rest on its past achievements because other countries, particularly Japan, could dominate the world market.

"The Japanese are not good at inventing. They are good at developing existing technology into better products and using existing consensus to gain advantages over their competitors," Dreyfus commented during a Cap Gemini-sponsored gathering.

The speaker stated that the DP and communications communities are faced with the responsibility of the future technological success of the world, and they cannot afford to let such an important task be handled by any other powers. He said that if the U.S. and Europe do not take the initiative in creating better and more user-friendly information processing systems, we will be seeing more "me too" products from Japan.

Dreyfus pointed to the highly touted "fifth-generation" computers that Japan supposedly has on the drawing boards as an example of technology that will not be a real innovation, but an improved copy. He stated that these proposed machines

(Continued on Page 125)

Exec: Northern Telecom To Continue U.S. Thrust

(Continued from Page 117)

In reviewing the 1982 performance, Light noted that the company incurred a nearly $100 million loss in its electronic office systems business. Much of this loss, he said, resulted from efforts to downsize that aspect of the business to a level the company claims will enable it to turn the corner in 1983.

Last year also saw the company increase research and development expenditures by 33% over the previous year, with plans to increase R&D this year by 18% or $285 million.

To reduce costs further in the face of a soft Canadian economy, Northern Telecom laid off some 1,800 Canadian workers in 1982, while increasing employment there in its 70%-owned Bell-Northern Research subsidiary and Semiconductor Components Group. Company employment in the U.S. rose by 5% in '82.

"Our revenues in Canada will be significantly lower in 1983," Light predicted. "However, we expect this impact to be more than offset by growth in the U.S. and international markets."

Finally, Light noted that the Canadian government's 15-year-old inquiry into the possible divestiture of Northern Telecom ended in January, with the government recommending maintaining the status quo.

"That good news gives us further reason to be optimistic about the future," Light said.

Inman Defines Goals of MCC

(Continued from Page 120)

Department," Inman said, referring to a recent department decision not to block the formation of MCC on antitrust grounds.

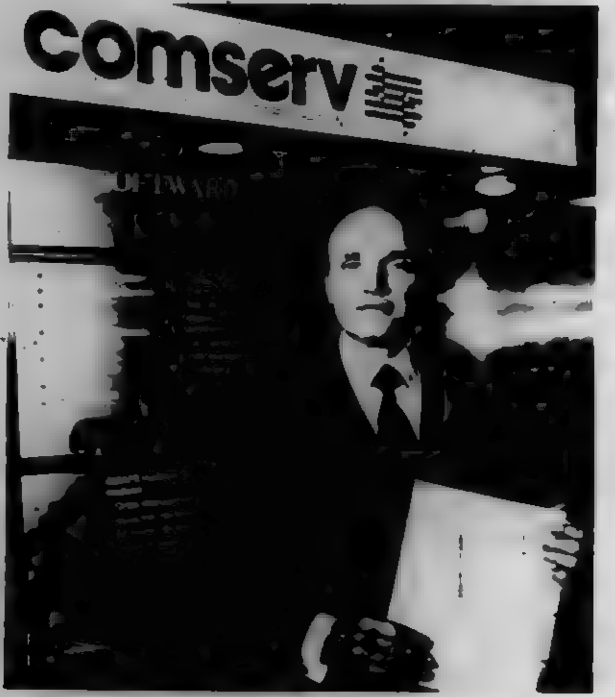
The nucleus of technological talent will come from the subscriber companies, although outside people will be hired in addition. "MCC will not produce any products, it will just hold the patents," Inman noted. "We won't fund basic research."

Inman compared MCC to the Japanese consortium, the Ministry of International Trade and Industry (Miti), noting that, unlike Miti, MCC will not be overseen by the government.

"I could see grants coming from the government," Inman said, adding that any governmental department would be treated as just another subscriber.

The government "really wants it to be a private-sector endeavor," the 51-year-old retired admiral said. However, Inman noted that he is not privy to administration policy and said he was not sure "what they may have up their sleeve."

Commenting on his accepting the top job at MCC, Inman said, "If we make it succeed, we may set an industry model. That's a hard challenge to walk away from. I won't get rich doing it, but I won't have to borrow money to pay tuition bills the way I have in the past."



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SIA Study Charges Japanese Harmed U.S. Chip Makers

(Continued from Page 117)

ductor industry went from a position of profitability to one of net operating loss starting in mid-1981 in the 16K- and 64K- RAM markets, a period which coincided with the massive entry of Japanese firms in these areas, entry the SIA charged was accompanied by unrealistically low pricing.

Competitive in Open Mart

Turning aside arguments that the Japanese success may be due to superior products and greater manufacturing resources, Sanders said that U.S. chip makers are operating at far less than capacity and noted that American firms do much better in Europe where they compete head to head with Japanese companies. This suggests, he said, that the price and quality of U.S. integrated circuits are competitive with Japanese products in a fair and open market.

Sanders said that the Japanese targeting is a violation of international trading arrangements, particularly the General Agreement on Tariffs and Trade, and said the U.S. government must seek to develop "a detente with the Japanese within a shared world market." The Japanese, he said, should be "a member of an integrated world economy and not a rapacious exporting nation."

Sanders and Noyce recommended "bilateral negotiations between [the] two very important trading partners," but Sanders added, "we are leaving it up to the [U.S.] government to decide the leverage or pressure or persuasion or legal tactic that they use."

Recommended Response

The SIA's recommended six-point U.S. government response to the Japanese targeting programs is as follows:

- Announcing a policy against allowing targeting "to undermine U.S. technological and economic leadership."
- Developing with industry a method of monitoring U.S. and Japanese semiconductor sales to provide early warning of danger to American firms; this must be backed by a commitment to take action against unfair foreign trading practices.
- Insisting that U.S. semiconductor firms receive commercial opportunities in Japan equal to those of Japanese firms.
- Seeking enforcement of international trade agreements through existing negotiating organizations.
- Using the above mechanisms as a model for responding to foreign targeting of other important U.S. industries.
- Enacting legislation giving the government a mandate and the authority to carry out these recommendations.

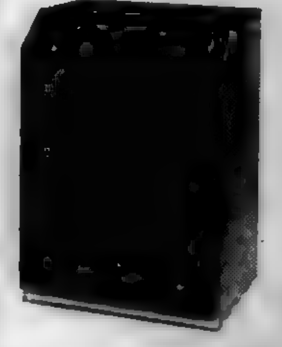
McQuillan Starts Consulting Firm

CAMBRIDGE, Mass. — Dr. John McQuillan, former president of BBN Information Management Corp., has formed his own company, McQuillan Consulting.

The firm was established to assist vendors and users of office automation and communications systems. It assists clients in strategic planning, architecture design, systems selection and technical and organizational implementation tactics, according to a spokesman.

McQuillan worked on the Arpanet packet switching network and also helped develop the Infomail electronic mail product.

McQuillan Consulting is located at 380 Harvard St., Cambridge, Mass. 02138.



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Geisco to Test NEC's First High-End CPU in U.S.

By Susan Blakeney
CW Staff

ROCKVILLE, Md. — The first Nippon Electric Co. Ltd. (NEC) top-of-the-line mainframe is slated to come to the U.S. next month for benchmark testing here at General Electric Information Services Co. (Geisco). Prior to this, NEC had only marketed its low-end Astra business systems in this country.

Geisco, with plans to upgrade its existing network of 30 Honeywell, Inc. DPS 8 computers some time next year, will install the NEC Acos 1000 system, which is said to be compatible with the firm's proprietary Mark III software as well as it's Honeywell equipment. Over the course of the year, the NEC machine will go up against Honeywell's own top-of-the line system, the DPS-88/81, Geisco said.

Gregory Liemandt, president and chairman of the board at Geisco, said of the NEC machine, "Now we have an alternative to look at. Not only is it compatible, but it happens to be very fast and very competitive."

While the Geisco president admits to a "long and healthy relationship with Honeywell," the ever-advancing forces of technology keep him comparison shopping: "We continue to look on the marketplace for the best price/performance we can possibly get.

"We have a couple of internal teams set up and they are going to evaluate the two machines. Which one gives us better price/performance; where can we expect more service, reliability — all the things you look at with two pieces of equipment. By the end of this year we are going to begin making decisions about which company is going to supply our next generation of mainframes."

(Continued on Page 130)

DPers Told Not to Rest"

(Continued from Page 122)

are supposed to revolutionize the industry, but in fact are just a product of Japanese hype.

"Fifth-generation computers are out of range. The Japanese say that they will produce 'knowledge processors' instead of information processors. Who knows what knowledge is? We know what information is, but how can we measure knowledge? Will computers be able to talk the way I do? Or will they be able to understand languages? I don't think so," Dreyfus commented.

Avoid Copying

The executive cautioned against trying to meet challenges which are not really challenges. He said that the U.S. and Europe should not worry about Japan's invention of the fifth-generation computer because it will not really be a technological breakthrough as much as a political issue. "Be aware of the Japanese but don't copy them. Make systems more user-friendly, yes. But do not fall into the trap and become copiers as Japan is."

Dreyfus maintained that the most important technological priority this "Atlantic alliance" faces is the improvement of information systems for the user and executive. He stressed that information workers should not try to re-invent programming systems' efficiency or new languages, but should concentrate on making existing systems truly accessible and usable to the common user.

Information technology has created a human crisis in industrialized countries, according to Dreyfus. He said that it is difficult for people to adapt to technological change and for that reason the U.S. and Europe have their work cut out for them. "Humans traditionally have a culture lag when it comes to technology. They cannot accept it immediately. In order to achieve success in the world in the future, information workers must realize their responsibility and create better products. Information workers are the future," he concluded.

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Michigan Court Decision

Court Rules Software 'Intangible,' Untaxable

By Lois Paul
CW Staff

DETROIT — The second highest court in Michigan has ruled that software programs are "intangible personal property" and, therefore, should not be subject to sales and use tax in two consolidated cases.

The ruling in the two cases, Maccabees Mutual Life Insurance Co. vs. state of Michigan Department of Treasury and City National Bank of Detroit vs. state of Michigan Department of Treasury, is being appealed to the state Supreme Court. If it is upheld, it will bring to 19 the number of states that exempt the transfer of custom and/or prewritten software programs from sales and use taxes.

According to, Ron Palenski, assistant general counsel for the Association of Data Processing Service Organizations, Inc., 28 states uphold the taxation of transfers of custom and/or prewritten programs. This includes California which, until recently, has exempted the transfer of custom software, but has taxed prewritten programs.

Michigan's decision also will add new fire to the controversy that has raged for years between the "tangible" and "intangible" software camps.

In June 1978, the state of Michigan Department of Treasury reportedly assessed use taxes amounting to $4,276.77 against Maccabees in connection with its use of several prewritten software packages between 1973 and 1975. The sum was paid and on Nov. 13, 1978, Maccabees filed an action in the court of claims seeking a refund and declaratory relief. In November 1979, a similar assessment amounting to $8,948 was made against City National Bank. The bank also paid and filed a complaint March 1980.

Consolidated May 1980, the plaintiffs received a summary judgment on Jan. 20 in which the judge determined that the software programs in question were intangible personal property and, therefore, were not subject to sales and use taxation. This decision was based, in part, on the deposition testimony provided by Robert Sherin, nonjudicial legislative adviser for the Data Processing Management Association, who served as Maccabees' expert witness.

Long an advocate of the "software is intangible position," Sherin said he thought the case would give "new fire to the issue." However, Martin A. Goetz, senior vice-president and director of the Software Products Division for Applied Data Research, Inc., a Princeton, N.J., software firm, denied this significance. His feeling was that this is merely one state's decision and, based on Palenski's breakdown of states' positions, does not represent a majority opinion.

Goetz's firm belief in software as a tangible product stems less from his concerns about taxation than from his interest in according to software the same status and protection given to hardware. "Something you can steal is not intangible," he said.

He said the differing views partly represent a split between software "manufacturers" and computer service companies that provide custom applications. "If a company is paying so many dollars for an outside consulting service and then has to pay sales tax, it increases by 5% to 8% its bill," he said, indicating that this added amount may inhibit users from turning to outside services. In addition, Goetz said some software firms have not been charging their customers the additional tax and "many of these companies feel they may go out of business if they have to pay back taxes."

"As I see it, there has been, at least to this date, no major court — that is, a state supreme court — that has ruled software to be tangible. They have all ruled it to be either intangible or the tangible representation of a personal or professional service," Palenski said.

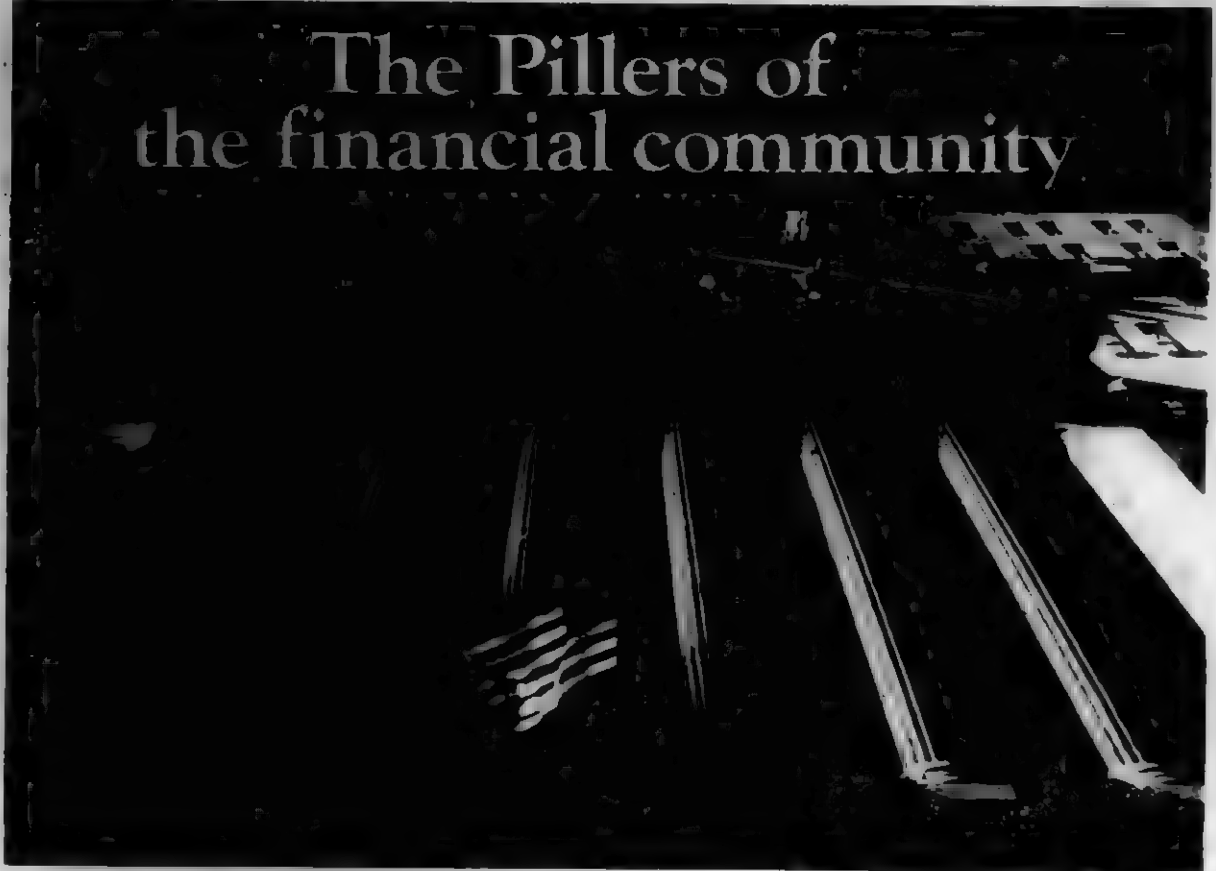
There are a number of states in which the matter is pending. These include Michigan, Maryland, Vermont and South Carolina.

Report Predicts CAR Growth

NEW YORK — The electronic filing and computer-assisted retrieval (CAR) micrographics market should increase from $80 million in U.S. sales in 1982 to $356.2 million by 1987, predicted a report from Frost & Sullivan, Inc. It also predicted that by 1985, the large systems market will be $111.4 million and the small systems market will be $104.7 million.

Calling its forecast in "The Electronic Filing Systems Market" conservative compared with other predictions, Frost & Sullivan pointed to high interest rates and the economy to justify its caution in assessing future market expansion. The study characterized the marketing strategy of major CAR producers.

The report costs $1,250 from Frost & Sullivan, located at 106 Fulton St., New York, N.Y. 10038.



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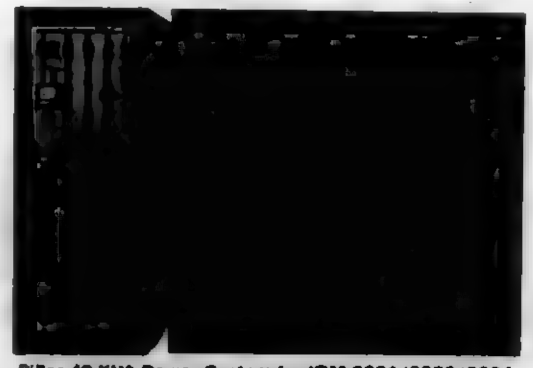

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Calif. Bill Proposes Custom Software Sales Tax

By Jeffry Beeler
CW West Coast Bureau

SACRAMENTO, Calif. — A tax break that California-based suppliers of custom software won only about four months ago may prove to be extremely short-lived.

State Assemblyman Richard Floyd (D-Los Angeles) has introduced a bill that would nullify a recently enacted law exempting custom software producers from California sales tax.

A.B. 72 has already emerged from its first reading on the assembly floor and is slated for review by the legislature's Revenue and Tax Committee on Feb. 14. But before it can find its way into the California statute books, the proposed legislation must survive at least two additional readings on the floor and win approval from a second assembly committee.

Whether A.B. 72 will ultimately be passed into law is still anybody's guess, according to Floyd's legislative secretary, Peggy Ryan.

If Enacted

If enacted, the bill would force suppliers of custom programs to boost the price of their products by 6% or 6½%, depending on where in California the companies are headquartered. The surplus funds would then have to be forwarded to government officials here in the form of a sales tax that is expected to contribute $25 million per year to the financially beleaguered state's dwindling coffers, Ryan said.

A.B. 72's passage might also force the state's custom software producers, many of which are quite small, to pay up to several years worth of back sales taxes, totaling tens of thousands or even hundreds of thousands of dollars per company.

In the face of such staggering delinquency assessments, many California-based developers of custom programs would probably have to declare bankruptcy and go out of business, according to Software Services Association chief Ann Strangman.

The question of whether custom software companies will ultimately be required to pay back sales taxes for their products is still open to speculation. In its current form, A.B. 72 reportedly makes back tax payments a virtual certainty.

But Ryan has urged Floyd to amend his proposed legislation to ensure that California sales taxes apply only to future sales of custom programs, not to products that have already been sold. "To tell the truth," the legislative secretary said, "I'm not sure [Floyd] is totally aware of his bill's ramifications and its possible impact on [software] companies, many of which would have a serious problem paying their back taxes."

Floyd has yet to react to Ryan's suggested revision or to indicate whether it will eventually be adopted, she added.

Reopened a Debate

A.B. 72's recent introduction has reopened a legislative debate that many California-based suppliers of custom software thought had been settled last September when then-Gov. Edmund G. Brown Jr. signed into law A.B. 2932.

Introduced last March 2 by state Assemblyman John Vasconcellos (D-San Jose), A.B. 2932 exempts custom program producers from paying back sales taxes. The legislation also exempts such firms from taxation on software that has yet to be developed and creates a $1.2 million fund to reimburse programming firms for sales taxes they have already paid.

Among software suppliers, A.B. 2932's enactment was widely hailed as a financial godsend. But in the corridors of state government, the bill's passage was greeted with widespread concern. Many California legislators and government officials viewed the sales tax exemption law as a serious revenue loss in a state where fiscal hardship has already become a way of life.

A.B. 72 was reportedly introduced in an effort to help alleviate California's financial distress by undoing or at least amending the recently enacted sales tax exemption law, thereby providing the state with an additional source of income.

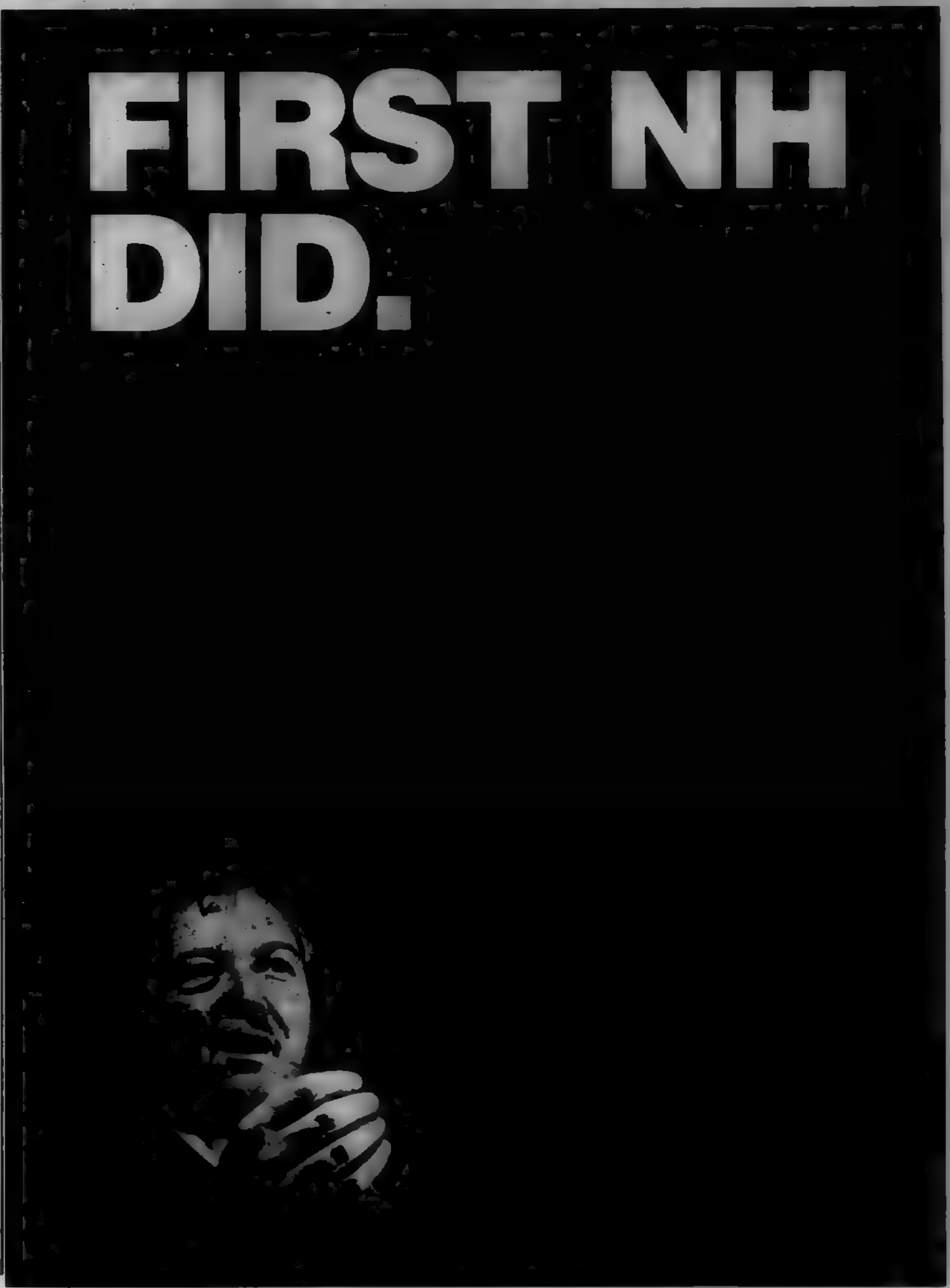
Prime Reports Profits Up in '82

NATICK, Mass. — Prime Computer, Inc. announced record annual sales and earnings for fiscal 1982, with profits climbing 20% to $44.9 million or $1.48 per share, and revenues rising 19% to $435 million.

Fourth-quarter figures were equally as strong, with profits of $12 million or 40 cents per share and revenues of $118 million, both up 19% over the same period a year ago.

Commenting on the reported results, Joe Henson, president of Prime, said that "the year was an extraordinary one for Prime . . . When economic recovery occurs, we believe that we will be a major beneficiary of the pent-up demand for products that permit increased operating efficiency.

"Results for the fourth quarter exceeded our expectations," Henson said. "However, we remain cautious with regard to a full-scale recovery of the economy," Prime's president concluded.



Bad News for Industry Executives

Bills Would Heighten High-Tech Export Control

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — American electronics industry executives, already chafing under the more onerous U.S. export control regulations, got some more bad news recently when three new bills were introduced in the U.S. Senate to stem illegal technology transfer to the Soviet Union.

The legislation stems from an 18-month Senate investigation into illegal technology transfer to the Soviet bloc, which found a rising Soviet effort to acquire through espionage, theft and diversion the latest in American technology, particularly in the microelectronics area.

A major proposal in the three bills introduced by Sen. Sam Nunn (D-Ga.), whose investigations subcommittee conducted the lengthy investigation into Soviet theft of U.S. technology, is a plan to transfer to the U.S. Customs Service all enforcement responsibilities under the Export Administration Act. This plan is likely to meet resistance from the electronics industry, which is already dismayed at what it considers high-handed and inept U.S. Customs Service investigative practices.

Nunn argued that the U.S. Commerce Department "to date has been unable to enforce the Export Administration Act in the face of mounting Soviet efforts to secure sensitive American technology." On the other hand, he said, Customs "has already shown its ability to handle such a task by the manner in which it has handled criminal enforcement of the Arms Export Control Act."

A major provision in the legislative package would expand Custom's enforcement authority by giving its agents express statutory authority for warrantless arrest and search and seizure upon reasonable cause in cases of outbound cargo and persons.

This provision will likely be the most controversial to the electronics industry, which is particularly unhappy with Customs' "Operation Exodus," the agency's drive to halt illegal technology transfer. After its first year, Operation Exodus had produced 765 seizures of outbound equipment, worth approximately $55.6 million. About 30% of those seizures involved computer equipment [CW, Nov. 22].

Criticizing Operation Exodus, one industry executive, John Fluke Sr., chairman of John Fluke Manufacturing Co., said here recently that the program needlessly delays legitimate industry shipments and described it as "inadequate procedures in the

(Continued on Page 134)

Geisco to Test NEC's Top CPU

(Continued from Page 125)

Asked to compare the two vendors, Liemandt commented, "They are two high-quality companies. They have cooperated with a wide-open mind."

Furthermore, he said Geisco had no predispositions regarding either machine, despite the fact that the NEC machine's raw speed is said to be more than double that of the Honeywell contender. "That is too simplistic," Liemandt said. "There are so many variables in addition to speed," he added.

Curiously enough, the current rivalry for Geisco's business between NEC and Honeywell comes in the wake of a technology exchange partnership that spanned some 20 years. According to a Honeywell spokeswoman, NEC's computer business was originally established in 1962 under Honeywell's wing. This accounts for the compatibility and similarity of the companies' respective product lines, with NEC manufacturing, selling and supporting the Japanese equivalent of Honeywell equipment abroad.

With NEC's Japanese formal distribution rights to Honeywell products expiring last year, NEC positions itself firmly in the race for Honeywell-cloned computer systems. At the same time, however, the two companies are reportedly conducting high-level discussions regarding patent and licensing rights.

"For 20 years it was a very beneficial relationship for both sides," Honeywell spokeswoman Kathy Tunheim said. "The whole situation at Geisco is one that is very much under review." She declined to comment on whether the two companies will continue in joint research and development projects at this point.

Meanwhile, Honeywell Information Systems' Massachusetts manufacturing plants will shut down the week of Feb. 21 due to a slowdown in industrial orders. The Lawrence and Brighton, Mass., plants that are affected, which employ roughly 2,300 workers, reportedly produce DPS 6 and DPS 7 computer systems, printed boards and CRTs. This shut down comes on the heels of Honeywell's massive Dec. 2 layoff, which furloughed some 1,850 employees [CW, Nov. 8, 1982].

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Fight Brewing Over Renewal of Export Act

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The long-simmering feud between the high-technology business community and the federal government over export controls has begun to heat up again as Congress begins deliberating renewal of the Export Administration Act.

The law, which prescribes U.S. export licensing procedures, expires later this year, and the competing interests have already drawn up their battle lines. Business wants streamlined export license processing and relaxed export restriction in the face of increased competition abroad; the government, while acknowledging the need to make export administration less cumbersome, is pledged to restrict the transfer of sophisticated, militarily useful technology to the Soviet bloc.

The first hearings on the law began in the Senate on Feb. 3, with members of the Banking Committee pressing for an independent Office of Strategic Trade to counter what many on the panel see as a "hemorrhage" of U.S. technology to the Soviet Union and its allies. The administration, for its part, argues that the Commerce Department, now charged with overseeing export controls, has the situation well in hand after years of acknowledged ineptitude and chaos.

The electronics industry, it seems, does not care who runs the show so long as the process does not unduly interfere with its ability to be a reliable supplier to overseas customers. While the industry is generally resigned to losing Eastern European orders to America's Japanese and Western European competitors, U.S. firms are still displeased with the licensing procedures, which are aimed at stopping technology transfer to the Soviet bloc, but also complicate and delay sales to friendly nations.

Despite the years of unyielding debate that have surrounded this controversy, there does not seem to be any great prospect for change in the government's outlook on the need for export controls. Assistant Commerce Secrtary Lawrence J. Brady, who heads the department's trade administration office and who is an inveterate hard-liner on export controls, told attendees at a high-technology industries conference recently that "Eastern Europe is not the end of the rainbow for U.S. industry; neither is the Soviet Union."

Private-sector arguments that U.S. export administration is seriously hampering the competitiveness of American firms are "garbage", according to Brady. Nevertheless, Brady and his boss, Lionel H. Olmer, Commerce undersecretary for interational trade, acknowledge the need to streamline export licensing procedures. Olmer told the Senate hearing the Commerce export office has cleared up the backlog of license applications and is now implementing a fully automated, on-line licensing system. Olmer also said his office has corrected the long-standing problems of lack of manpower and resources.

Preliminary indications are that these changes will not mollify the Senate, which continues to be unhappy with Commerce's primary role in export control. Sen. Jake Garn (R-Utah), chairman of the Banking Committee, was quite explicit about the outlook for goverment restructuring in this area: "I'm not going to accept the [Commerce Department's] excuses of the past; I'm not going to accept the rhetoric that [the department is] going to improve."

But Garn also warned the business community not to expect any reduced restriction on technology transfer to the Soviet Union. He asked for private-sector cooperaton in drafting new export administration legislation, but cautioned business not to lobby Congress for changes "solely for the purpose of profits."

Bills Propose Export Control

(Continued from Page 130)

hands of inadequate people." A congressional opponent of the Customs operation, Rep. Bill Frenzel (R-Minn.) has remarked that "the Exodus program and the extreme application of the Export Control Act is disastrous" to small firms.

It is one thing to prevent loss of national security through technology transfer, Frenzel said, but it is quite another to allow the government to institute "a broad-scale program of harassment for technical exports."

Other key provisions of the new bills would:

- Amend export law to make it a crime to possess with the intent to export technology whose export is restricted.
- Set increased prison sentences and fines for illegal exports.
- Allow electronic surveillance where there is probable cause to believe there is a violation of export regulations.
- Direct the president to negotiate with U.S. allies to prosecute or extradite individuals indicted in the U.S. for export law violations but who have fled the U.S. to escape prosecution.

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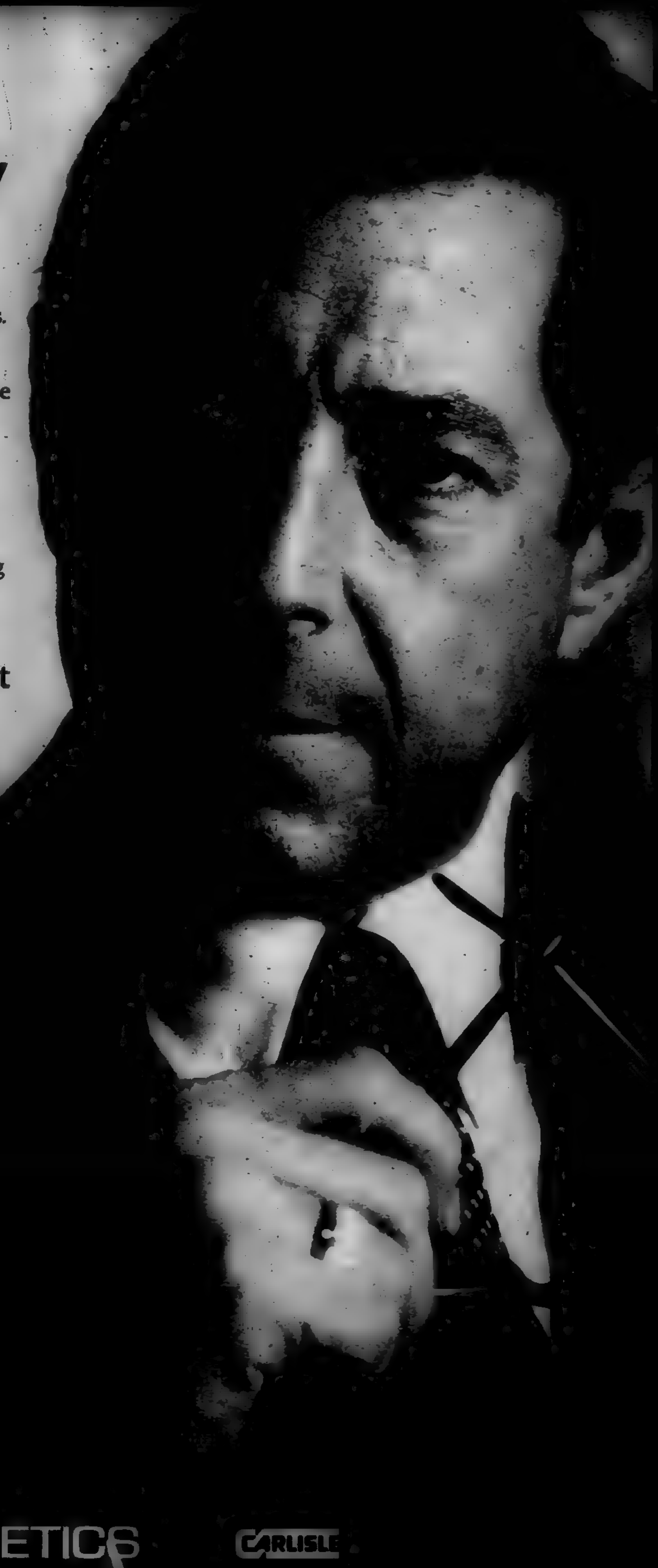

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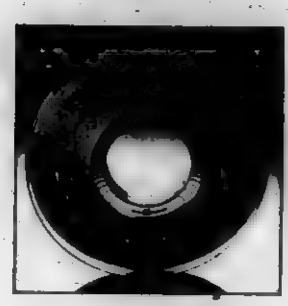

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After Official Breakup

CCIA Head Sees AT&T-BOC Remaining Cozy

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Although the U.S. Department of Justice has supposedly ended AT&T's control over the local-exchange bottleneck, the company's recently proposed reorganization plan will nullify that victory, Jack Biddle, president of the Computer and Communications Industry Association (CCIA), claimed.

From what Biddle and others said, there seems to be widespread fear among independent vendors of terminals and computer-based information services that AT&T's special relationship with the Bell operating companies will continue after "D-day" — Jan. 1, 1984 — when the present Bell System is officially scheduled to be broken apart. Users, meanwhile, fear the Bell operating companies will be left underfunded and will raise their rates as a result.

The CCIA, which represents major manufacturers of intelligent terminals, is one of several industry groups that will submit comments on the AT&T reorganization plan this week to Judge Harold Greene, who presides over implementation of the U.S. vs. AT&T antitrust settlement negotiated by government and AT&T lawyers last year.

However, one attorney, who prefered anonymity, said many criticisms of the reorganization plan will not be included in this week's comments. It would be bad strategy, given the difficulty of reversing Judge Greene on an appeal, he explained. The smarter course, he added, would be to submit the objections to the Federal Communications Commission.

While Judge Greene's future verdict on the reorganization plan is not likely to be appealed, his decision of last summer, which accepted (with some changes) the settlement negotiated by AT&T and the Justice Department, already has been appealed. This latter development makes the future of the whole divestiture process uncertain. The appeals are now pending before the U.S. Supreme Court, which hasn't yet decided whether to consider them.

According to a spokesman for the Tele-Communications Association, which represents 500 corporate, government and educational users on the West Coast, the Bell operating companies have already told Judge Greene that if divestiture produces any revenue shortfall, the loss will be made up by increasing local-exchange access charges.

Biddle's concern about continuing AT&T control over the divested Bell operating companies stems largely from a "central organization" authorized by the settlement agreement.

In essence, the agreement says that the Bell operating companies must provide a single point of contact for military and civil emergency agencies of the federal government; the Bell operating companies may also centralize the provision of "engineering, administrative and other services which can most efficiently be provided on a centralized basis."

To implement this provision, the reorganization plan establishes a "central staff organization"; after divestiture, it will be owned by the seven regional holding companies that are to become the corporate parents of the divested Bell operating companies, but "more than three-quarters" of its 8,800 employees will be transferred from AT&T and its affiliates.

What bothers Biddle is that this new organization will perform a number of functions that he believes should be done by a "neutral" organization, one that includes representatives of the specialized carriers and non-Bell telephone companies. Because of the way the new central organization is being staffed, and because all of the regional companies are headed by transferred AT&T executives, Biddle doubts whether the organization can, in fact, be neutral.

And if it isn't, "AT&T will be free to go back to its old tricks," he said.

L.A. Newspaper Sued for Libel

BOULDER, Colo. — Computer Automation, Inc. has filed a libel suit against the *Los Angeles Times* for printing a story in which the newspaper wrongly identified Computer Automation as a "financially troubled" company that "lost nearly $5 million" last year.

The paper has since printed a retraction, a *Times* spokesman said.

The suit, filed in Los Angeles Superior Court, seeks unspecified general and special damages and not less than $1 million in exemplary damages, according to the company's attorney.

The complaint states that the story was "false and libelous on its face," alleging further that "with ordinary and reasonable care," the *Times* should have realized that the story was "obviously false and grossly libelous."

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Changes in Service Sector Seen Impacting Field

By Jim Bartimo
CW Staff

Changes in the service sector of the computer industry will have an effect on users and third-party maintenance providers alike, industry sources have indicated.

The first change comes from the vendor community, where some 80% of firms surveyed now treat their field service department as a profit center, according to a recently released International Data Corp. (IDC) report entitled, "Vendor Strategies for Field Service Operations."

Many of these firms have made this transition within the past few years; and the remaining 20% are considering "a switch from cost center to profit center treatment within the next few years," the report said.

"If you look at the traditional computer vendor," said Marvin Venable, vice-president of marketing for third-party maintenance provider Sorbus, Inc. of Frazer, Pa., "they're looking at the service line of business as a *business* because service revenues are up 25% to 30%."

While service contracts once cost the user 8% to 12% of the purchase price of hardware, newer, more reliable hardware has brought that figure down to 2%, IDC found. Along with this decrease has come a marked increase in service contract prices for older equipment and on-call service rates. "On-call" service rates have risen at a compund 20% per year over the past five years," IDC found, "far outstripping inflation."

IBM, for instance, has raised its hourly rate of service from $40/hour to $127/hour over the past two years, according to Richard Johnson, president of Computer Maintenance and Leasing Corp. of Minneapolis, Minn. Such a steep increase has caused problems for some third-party maintenance providers, caught in the squeeze between higher vendor rates and lower monthly fees from their own customers (see story below).

But providers with their own staff of field technicians such as Sorbus do not see the vendors' entrance into the service market as a major threat. "We have 160 branch locations today," Venable said, "so we can offer more support than they can. Once you get past [Digital Equipment Corp.] and IBM, our coverage compares favorably with the rest of the industry."

IDC also found that many third-party vendors will be to a large extent "relegated to servicing the older equipment a vendor would just as soon ignore," unless the provider enters into an OEM agreement with the vendor.

Venable predicted that OEM agreements will spring up with younger, less established companies and agreed that older equipment may often be left to the provider. This will not exclude providers, however, because a new portion of the service market is opening up — microcomputers.

"There will be tremendous growth in the micro area for third-party providers," Venable said. "We think users would prefer to deal with one company [for service of a large number of micros] than 50 dealers."

CMLC Disputes IBM Practices

MINNEAPOLIS — One third-party provider here has called some of IBM's service practices "quite monopolistic," pointing to a drastic rise in the hourly IBM service rate.

Computer Maintenance and Leasing Corp. (CMLC) has leveled the complaint, claiming CMLC is different from many other third-party providers in that it often does not send its own technicians to service its customers' needs. Instead, it offers a kind of insurance policy.

CMLC offers a maintenance agreement comparable to IBM's to its customers and then hires IBM on a per-call basis for service. IBM bills CMLC's customers, but CMLC pays the bill as part of the service contract/insurance policy.

Delaware, Ohio's financial department is one of CMLC's customers that pays a $480 monthly maintenance fee for both hardware and software. But IBM has raised its hourly rate from $40/hour to $127/hour in the last two years, according to CMLC President Richard Johnson.

This price hike must either be passed on to its customers or it will eat into CMLC's profits. "It narrows the profit margin," Johnson said, "but [we] solve that with better planning, management and cost efficiency."

On one occasion, CMLC fell behind on Delaware's payments to IBM and the vendor put the city on a cash-only system of payment for a time. The department had experienced a head crash on its IBM System/34 that cost $3,500 to repair. The bill is now paid up and Delaware is back in good standing with IBM, but some bitter feelings still remain.

"We have had some problems with IBM," Johnson said. "They've been tightening up relationships with third-party organizations. They acted on people who have been 30-days out (have not paid their bill within 30 days). I can only guess what their motives are."

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Forecasts & Findings

IBM will respond to the introduction of Apple Computer, Inc.'s Lisa business system with a more aggressive microcomputer strategy, including the introduction of a high-end version of its Personal Computer, according to **IBM's Personal Computer Strategy — The Next Round**, by Strategic, Inc.

The report predicted that IBM will also introduce a portable or handheld Personal Computer this year as well as a Bell Laboratories Unix-type operating system for its high-end micros. IBM will assume a greater focus on the consumer and hobbyist market, with hardware add-ons and software for technical, home, educational and domestic financial applications, supported by an advertising and distribution campaign targeted at this market, the report continued. The price of the report is $1,500 from Strategic, Suite 215, San Jose, Calif. 95129.

* * *

The Western European market for small business computers will more than double through 1986 to $3 billion as market forces move away from technological aspects toward a business solution orientation, according to **Small Business Computers in Western Europe**, by Creative Strategies International.

According to the report, individual markets with the strongest growth prospects will be Italy, France and Spain, with individual compound growth rates of more than 16%. West Germany, the largest single market in 1981, will within three years drop from purchasing 24% of Western European unit sales to purchasing 20%. Additionally, the proportion of small business system sales through direct sales will decline from 65% in 1981 to 45% in 1986 as vendors develop other methods of distribution, the report stated.

Priced at $1,450, the study is available from Creative Strategies International, Suite 275, 4340 Stevens Creed Blvd., San Jose, Calif. 95129.

* * *

The increasing interaction between the computer and communications industries is threatening to overturn the heretofore stable structure of the telecommunications market, according to **The U.S. Communications Industry: A Strategic Analysis**, by Venture Development Corp.

The study maintained that in constructing their computer and communications systems, users will continue to buy from many different vendors rather than to select from the market dictates of any one large supplier such as IBM, AT&T or Xerox Corp. In addition, IBM will be more effective than AT&T in entering new markets in the telecommunications sphere, because IBM is competitively honed, whereas AT&T still thinks like a utility, the report stated.

Priced at $950, the report is available from Venture Development, 1 Washington St., Wellesley, Mass. 02181.

* * *

The recession has had a negative effect on the CRT terminal market, with a 1982 shipment growth of 15.6%, down from the 20%-plus growth of previous years, according to **CRT Terminals: Markets and Strategies**, by Advanced Resources Development.

The report noted that improved price/performance ratios were responsible for last year's still-healthy growth, with shipments of IBM 3270-type terminals showing the slowest overall growth. Shipments of smart and dumb terminals were approximately equal for the year, totaling 232,000 and 234,000 units, respectively, the report found. The study projected that 6½ million terminals will be shipped between now and 1987, with the highest growth rates in shipments of smart/editing as well as IBM 3270 and compatible terminals. Priced at $1,695, the study is available from Advanced Resources Development, 28A Park St. Station, Medfield, Mass. 02052.

* * *

U.S. military spending on electronic memories will grow to $1.3 billion by 1987, a 635% increase over 1982 spending, according to **Military Electronic Memory Market** in the U.S., by Frost & Sullivan, Inc.

How quickly the military utilizes electronic memories will depend on how rapidly it deploys computer-based systems, something that has been delayed somewhat by disputes over microcomputer technology strategy, particularly the question of military-standard computers, the report said. The report is priced at $1,250 from Frost & Sullivan, 106 Fulton St., New York, N.Y. 10038.

* * *

The value of shipments of smart, alphanumeric terminals will exceed $3.6 billion by 1986, with non-IBM-3270-compatible terminals accounting for 51.2% of smart terminal shipments, according to **The Alphanumeric CRT Terminal Industry: A Strategic Analysis**, by Venture Development Corp.

The study includes an analysis of industry structure, dominated by about 30 manufacturers; the impact of graphics on the alphanumeric CRT terminal market; emerging plug-compatible markets; foreign competition; and pricing. The study is priced at $2,790 and is available from Venture Development, 1 Washington St., Wellesley, Mass. 02181.

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To Foster High-Tech Competition

Group Warns Against Matching Federal Policy

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Key electronics industry executives and ranking federal government officials joined together last week to warn against the dangers of trying to fashion an American industrial policy to foster the international competitiveness of high-technology companies.

Sharing a podium last Tuesday at a high-technology industries conference on public policy for the 1980s, the corporate and government representatives noted the difficulty of matching centralized federal policy to the free enterprise system that has nurtured the multibillion dollar explosion of high technology in this country.

Detecting "a growing clamor" for a U.S. industrial policy to protect and enhance the competitiveness of American high-technology firms, Lionel Olmer, undersecretary of the Department of Commerce for international trade, said "the debate over whether the United States requires an industrial policy is very fuzzy-headed.

"One thing we don't need," Olmer said, "is to form an industrial policy of our own to match those of our foreign competitors. Industrial policy as it is conceived abroad means establishing a national planning unit with authority to pick industrial 'winners' and 'losers' and to divvy up government favors accordingly."

Such a policy, he said, would "distort the critical functioning of the free market. But it would also create a bureaucratic nightmare — one destined to be controlled by political pressures rather than any kind of rational process." He suggested the proper role of the government is to create a favorable economic climate through reformed antitrust law, more liberal research and development tax treatment and efforts to ensure fair access to markets overseas.

'Entrepreneurial Climate'

Similarly, T.Z. Chu, former American Electronics Association chairman and president of Finnigan Corp., a San Jose, Calif., maker of electronics instruments, said the government should concern itself with fostering an entrepreneurial climate. "The free market is a more reliable judge" of the proper industries to support than any federal bureaucracy, according to Chu.

But as is customary in this debate over federal industrial policies, the private sector's aversion to government interference was tempered by consideration of the industry's increasing lack of competitiveness in world markets and the question of whether the government should act to protect U.S. firms in international trade.

While calling for continuation of the U.S. "private enterprise policy," Motorola, Inc. Chairman Robert W. Galvin said the U.S. must "stiffen [its] backbone" and "take some actions" against countries, particularly Japan and France, which in his words "don't really believe there should be free trade." Negotiations toward more open trade have consistently failed and only direct retaliatory actions or their threat have had any success, according to Galvin.

High-technology firms, Galvin said, "can hold [their] heads high as being institutions that do not come to [Washington] with hat in hand" asking for favors. He suggested, however, that there are steps the government can take to assist industry short of centralized policy making.

Sen. William Roth Jr. (R-Del.) agreed. He is lobbying for a bill he has introduced to consolidate the far-flung government offices responsible for trade into one new agency. This restructuring, backed by a concerted government review of international trade negotiating mechanisms and practices, is a necessary first step to ensure continued U.S. competitiveness overseas, he said.

Warning against protectionist measures, Roth called for a program to anticipate problems "such as those that have been encountered by the footwear, textile, automobile and steel industries, before the problems get out of hand."

In the same vein, Rep. Bill Frenzel (R-Minn.), who called himself "one of the last old-fashioned, unreconstructed free traders," said "the largest barrier to [U.S. industry] success abroad consists of self-inflicted wounds distributed by the government." Rather than talk about protecting industries, the U.S. should recognize that it is already protecting a number of them, including textiles, shoes and dairy. The government should practice what it preaches and set a better example for the rest of the world, he said.

Frenzel also warned that the high-technology industry "has not been a significant lobbying voice in Washington." He predicted that if Congress does develop a more actively protectionist industrial policy, "you people are likely not to be the protected party."

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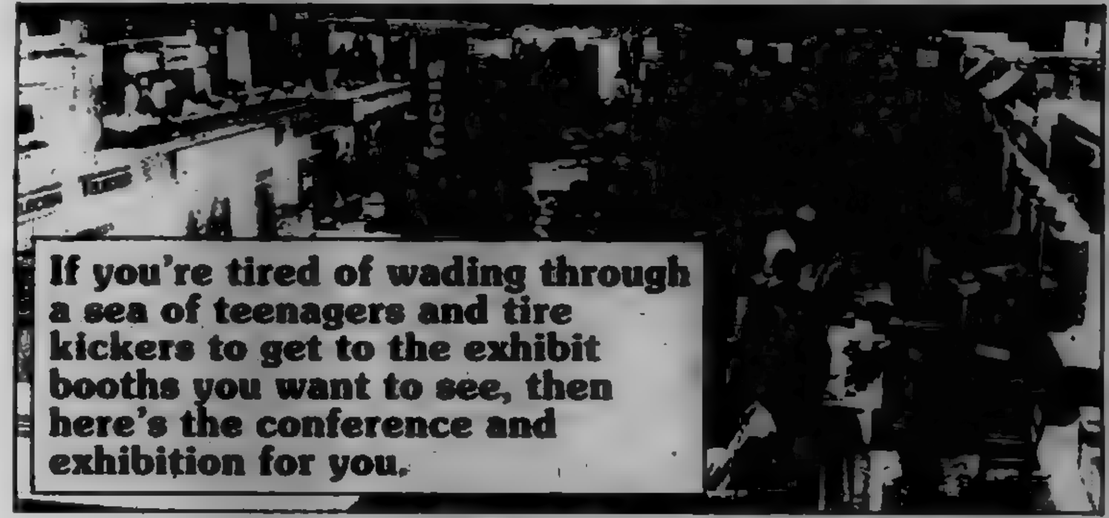

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Burroughs Reports Profits Nosedive 22% in '82

DETROIT — Profits at Burroughs Corp. in 1982 nosedived to $117 million or $2.80 per share, down nearly 22% from the earnings mark of 1981 of $149 million. On the other hand, Burroughs' worldwide revenues in 1982 rose 23% to $4.2 billion.

Moreover, the company reported a fourth-quarter operating loss of $15.6 million or 37 cents per share, down from previous fourth quarter earnings of $63 million or $1.51 per share. Burroughs attributed its quarterly loss and lowered annual results to an accounting change and "adjustments resulting from management decisions."

The two major components of the adjustments consisted of charges totaling $84 million after taxes, relating to changes in inventory valuations, and a credit of $17 million.

Commenting on the 1982 results, W. Michael Blumenthal, chairman and chief executive officer, said, "The operating results, although 19% higher than in 1981, were less than we had hoped. They reflect the difficult worldwide environment and the continued strength of the U.S. dollar which prevailed throughout 1982.

"We believe the results reflect improvement in operating procedures and the beginning of a realization of the benefits from the new product programs, organizational restructurings, manufacturing consolidations and other changes," he continued.

Supershorts

National Education Corp. and **Perceptronics** have signed an agreement for the joint development, production and marketing of Actioncode, an interactive training system that will use a touch-screen monitor and scanning ward for access instead of a keyboard. National Education Corp.'s ICS-Intext Division will develop and market the system and Perceptronics will be responsible for programming the course materials.

* * *

Nicholas F. Brady has been appointed a member of the board of **NCR Corp.** Brady, named to the board in April 1974, resigned in April 1982 to accept an appointment as a U.S. Senator from New Jersey. He resigned from the Senate in December 1982. The board also announced plans to name NCR President Charles E. Exley Jr. chief executive officer following the annual stockholders meeting in April. The present chief executive officer, William S. Anderson, will continue as chairman of the board until his retirement in May 1984.

* * *

Gordon A. McAlpine of Gros-Tite Industries, Troy, Mich., has been elected president of the Computer and Automated Systems Association of the Society of Manufacturing Engineers (Casa/SME), succeeding Richard G. Abraham of Sangamo Weston, Inc. in Atlanta.

* * *

Northern Telecom, Inc. has formed a **Memory Systems Division.** The new operating unit, located in Ann Arbor, Mich., will design, manufacture and market disk and tape drives.

* * *

Raytheon Co. has combined its government marketing, international marketing and government relations activities into the Office of Corporate Marketing. Philip Phalon, vice-president, corporate marketing, will head up the new unit.

* * *

I.P. Sharp Associates and **McGraw Hill** have formed a joint venture, the **Electronic Markets and Information Systems** (Emis), an international chemical trading system. Emis subscribers will have access to the service through terminals linked to the I.P. Sharp network. McGraw-Hill will operate the joint venture.

* * *

DMC Systems, Inc. will provide third-party maintenance and support for **Molecular Computer Co.'s** supermicro product line in about 120 U.S. locations.

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Management Assistance, Inc.'s Sorbus Service Division will provide maintenance and repair service for **Non-Linear Systems, Inc.'s** Kaypro II at its 160 field locations.

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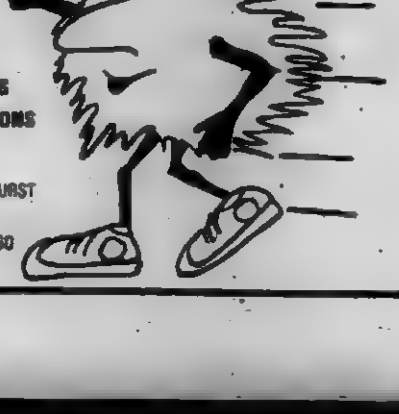

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Executive Corner

- **Robert Bass** has been named vice-president of manufacturing for Callan Data Systems, Inc.
- **James D. Huff** has been appointed vice-president of the Software Products Division at Applied Data Research, Inc.
- **R.E. King** has assumed the duties of chairman of the board of Deltak, Inc. **T. Kendall Hunt** has succeeded King as president and chief operating officer.
- **Dr. James J. Tietjen** has been elected president and chief operating officer of RCA American Communications, Inc.
- **Bruce B. Gitlin** has been appointed vice-president, planning, of Xerox Corp.'s Office Products Division.
- **Richard M. Lion, Gerald J. Rohan** and **Charles S. Ronig** have been elected corporate vice-presidents and **Ronald S. Edwards Jr.** has been elected senior vice-president at Rand Information Systems, Inc.
- **Howard B. Emerson** has been appointed vice-president, Microsystems Group, and **Robert B. Way**, vice-president, Products Group, at California Software Products, Inc.
- **John J. Theiss** has joined Wordplex Corp. as executive vice-president and general manager.
- **Paul J. Kofmehl, Victor R. MacDonald** and **James F. Manning** have been elected vice-presidents of IBM and **George G. Houser** has been named a vice-president of the firm's Federal Systems Division.
- **John G. Balletto** has been elected senior vice-president for marketing and sales, **Douglas G. Fairbairn**, senior vice-president of user-designed technology; **Kenneth A. Goldman**, vice-president of finance, chief financial officer and corporate secretary; and **Ronald C. Kasper**, vice-president of sales at VLSL Technology, Inc.
- **Arrington Dixon** has been named a vice-president of PRC Computer Systems, an operating group of Planning Research Corp.

New Companies

Innovative Office Systems, Inc. has been formed to provide consulting services in office automation systems and organizational development. Further information is available through P.O. Box 12432, Toledo, Ohio 43606.

Interface Conversion Services, Inc. is a service bureau providing media conversion services including disk-to-disk and disk-to-phototypesetting diskettes or nine-track magnetic tape. Information is available from Suite 3, 603 W. Broad St., Falls Church, Va. 22046.

Software Collaborative Ltd. is a software company specializing in the development of interactive front-end data base products. It is located at 50 Church St., Cambridge, Mass. 02238.

Performance Technologies, Inc. is a firm that provides training and educational programs, including applications of small computers for the health field. It is located at Suite 3610, 405 N. Wabash Ave., Chicago, Ill. 60611.

Futurenet, Inc., a firm specializing in the development, manufacturing and marketing of workstations for personal computers, has been founded by Bruce Gladstone and Paul Page, co-founders of Futuredata Computer Corp., and Dennis Kinion. Gladstone is president and chief executive officer; Page, vice-president of research and development; and Kinion, vice-president of operations. The firm's headquarters are at 21018 Osborne St., No. 5, Canoga Park, Calif. 91304.

Omniprise, a firm specializing in proprietary small business account and management systems sold as turnkey packaged systems, has been founded by former Intel engineers Gary Gear and Steven S. Wiseman. It is located at 1416 E. Commodore, Tempe, Arizona.

Systems Strategies, Inc. has formed **Systems Strategies Software Publishing, Inc.**, to market and distribute personal computer software. Further information can be obtained from 225 W. 34th St., New York, N.Y. 10001.

Foundation Computer Systems, a firm providing consultation services for organizational planning and software product development has been formed by three former Data General Corp. executives and a software consultant. The firm says it will develop and market fourth-generation software development aids. It is located at Suite 330, 976 Walnut St., Cary, N.C. 27511.

Computer Logic, Inc. is an artificial intelligence software development firm specializing in expert systems and natural language processing. Further information is available from Joseph B. Elad, 17 Gumwood Drive, Wilmington, Del. 19803.

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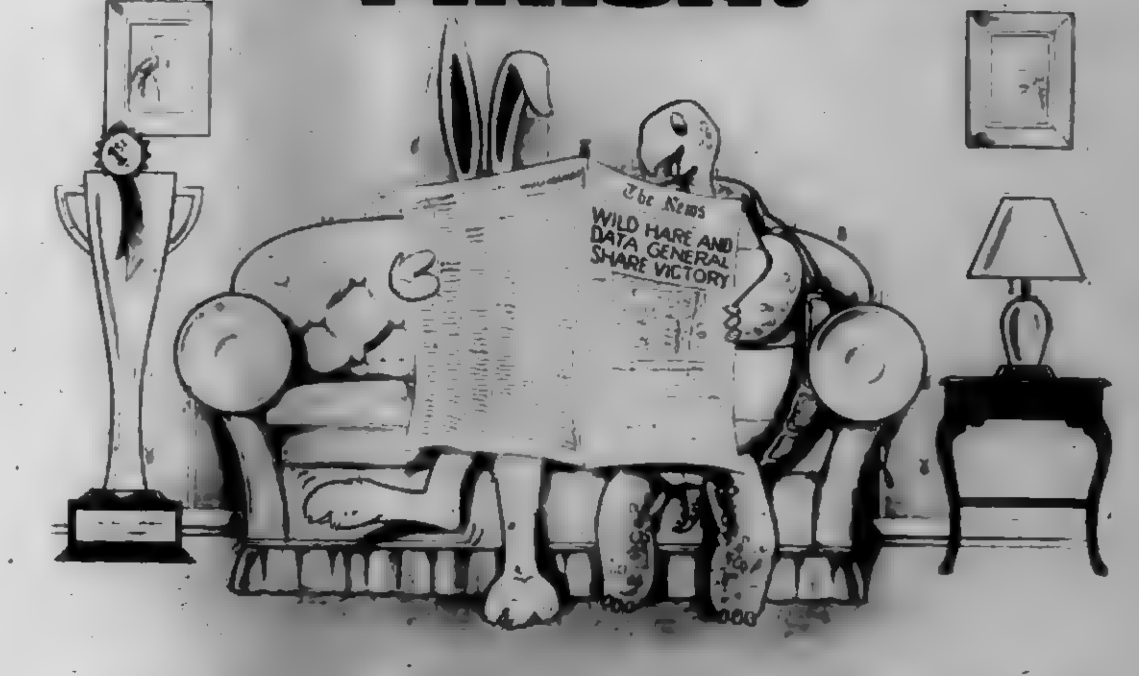
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Are you so busy doing your job that you've forgotten your career? In the rush of todays responsibility, many people are missing tomorrows opportunities. Invest a few minutes call PAM SPEARS CPC or send a confidential resume. You may find that you qualify for a position in an ideal location with even greater responsibility than you have now. All positions fee paid

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ROCKY MOUNTAIN LOCATIONS

We are seeking Data Processing Professionals for prime positions in the Rocky Mountain Area.

Our client company, a major financial institution currently has openings for Systems Programmer and Demand Deposit Programmers. The successful candidate for the position of system programmer will have a minimum of 2 years of MVS JESII internals knowledge with good assembler programming skills. Salary to 32K. The successful candidate for the position of DDA programmer will have 2-3 years of IBM Cobol experience in DDA applications. OS and Hogan a plus. Salary to 32K. Excellent benefits. Confidentiality assured.

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PROGRAMMER ANALYST

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If you are challenged by designing and implementing state-of-the-art computer systems, the Hertz Corporation in Oklahoma City has an outstanding career opportunity for a Programmer Analyst with Tandem experience.

At our Worldwide Reservations Center, our Systems professionals help support the worldwide reservations center communications network.

The individual we are seeking should have the following experience:

- **2 - 5 years of data processing experience**
- **Communications background**
- **Design and/or implementation of applications systems on Tandem**
- **Thorough knowledge of various Tandem software components**
- **Experience with PATHWAY, TAL, EXPAND, ENFORM, DDL, GUARDIAN, and COBOL preferred**

This position offers a competitive salary and excellent benefits, including: RELOCATION PROGRAM, COMPANY PAID LIFE/MEDICAL/DENTAL INSURANCE FOR EMPLOYEE AND DEPENDENTS, SAVINGS PROGRAM, RETIREMENT PLAN AND MUCH MORE. If qualified, please submit your resume and salary history, in strictest confidence, to:

The Hertz Corporation
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Hertz

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FMC

in Dallas

Our Dallas data center is the focal point of our national & international data processing network. This center provides the technical support to 137 manufacturing facilities and mines in 29 states and 15 other nations. FMC is a major producer of machinery and chemicals for industry and agriculture with annual sales of over $3.5 billion.

Our state-of-the-art operating environment consists of systems such as multiple 3081's, 4341's, 8100's, 3380's, 3705's, IMS DB/DC, SNA, TSO, VM/CMS, TCAM, VTAM/NCP, MSNF, NCCF and MVS/JES.

The following positions are currently available due to our rapid expansion:

Lead Systems Programmer (MVS/Internals)	Responsible for software installation, maintenance, debugging and overall performance monitoring. Candidates will develop standards and procedures and should have a minimum of five years MVS Operating Systems Programming experience in a large IBM mainframe environment.
Senior Capacity/ Software Planner	Responsible for participating in evaluations and justifications of software products; contributing to the development of strategic software plans and performing technical analysis to support development of hardware plans. Must also manage the corporate computer network, software portfolio and hardware inventory to insure cost effective data center operations. Candidates should have a minimum of 3 years experience determining computer hardware and software requirements. Should be familiar with MVS and VM/CMS related software products, both internals and overall relationships. Should possess a knowledge of SMF, RMF, MVS tuning techniques and statistical analysis tools. BS degree in a technical discipline is preferred.
Lead Systems Programmer (CICS)	Responsible for installing and maintaining new release of CICS. Opporunity to develop skills in IMS DB/DC. Candidates should have a minimum of three years experience as a CICS Systems Programmer. Experience with CICS applications Programming, TOTAL, and IMS is preferred.
Systems Programmer (Program Product/ TSO Support)	Responsible for installing and maintaining Program Products in an MVS environment and supporting the TSO system. Candidate should have at least one year systems programming experience in an MVS environment. Experience with ALC, TSO, ACF2 and SPF desirable.
Forecasting Analyst	Responsible for both short and long term forecasting of Data Processing usage and interfacing with all levels of management and the user community. Candidates should have at least 2 years forecasting experience. Some exposure to Data Processing and mechanized planning software such as: IFPS, SAS, or FORESIGHT would be a plus. A Degree in Business, Math or Economics is required.
Lead Network Systems Programmer	Responsible for the development and execution of plans for installing, operating, diagnosis and monitoring of network software and related products. Educate operators and users as needed to insure efficient use of resources. Candidates should have 3 or more years systems programming using ACF/VTAM and NCP. A knowledge of MVS and JES and a BS degree in a technical discipline or its equivalent is required.

As a successful international corporation, we offer a superior remuneration and benefits package, along with an outstanding atmosphere for rapid career growth. **Please send resume to: FMC Corporation, MIS Employee Relations, Dept. JS1, P.O. Box 470487, Dallas, Texas 75247.** *We are an equal opportunity employer m/f.*

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Rio Grande Valley/ San Antonio, Texas

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For the Rio Grande Valley, call Joe Bosso COLLECT at (512) 993-3740 and for the San Antonio area, call Gene Powers COLLECT at (512) 734-4368. If you are unable to call, send your resume and salary history to: Jerald Harris, Digital Equipment Corporation, Dept. 0214 3804, 6200 Savoy Drive, Suite 1000, Houston, TX 77306. (713) 977-7575.

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IBM Systems Programmer

(Bored with the routine Jobs?)

In this position you will be involved in a complex multi-computer software development system using the latest tools and techniques to support diverse projects. This is an opportunity for an innovative person to work with our highly qualified and creative staff to develop unique solutions.

To qualify you must have: 2-4 years' computer operatives and programming experience which includes 1-2 years OS Systems programming; Familiarity with IBM/370 architecture and BAL Assembly language. Telecommunications experience and 3705/EP programming a plus.

Intermetrics is an established and growing software/systems engineering firm with 12 branch offices across the country and overseas. We offer Flex-time, excellent salaries, and an outstanding benefits package which includes 3 weeks vacation, group insurance, and profit sharing.

For more information, call Winifred Hentschel, any weekday 8:30 am-5:30 pm at (617) 661-1840 or write to her at: Intermetrics, Inc., 733 Concord Avenue, Cambridge, MA 02138.

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MCNC is a non-profit corporation that is collaborating with five universities and a private contract research institute to develop a nationally significant research and educational program in microelectronics. MCNC operates 3 VAX-11 computers and a network linking them to 6 others. The principal applications are program development, electronic mail and file transfer, document preparation, and VLSI system design using high-performance color graphics stations. MCNC is seeking qualified individuals to staff the following positions.

SYSTEMS PROGRAMMER

The Systems Programmer will design, document, code, test, and maintain system software, with particular emphasis on high-quality data communications. Applicants must have experience in both computer communications and software engineering and must know the C language and UNIX system internals (preferably 4 BSD). Formal training with a master's degree in computer science is highly desirable.

DEVELOPMENT PROGRAMMER

The Development Programmer will implement and maintain components of a new software system for the computer-aided design of digital microelectronic circuits and systems. This position requires a sophisticated understanding of algorithm and data structure design, as well as knowledge of software engineering techniques and programming practices in a language with modern control structures. Knowledge of digital IC design, UNIX, and the C language is highly desirable. Applicants must have a master's degree in computer science or a bachelor's degree and several years of programming experience.

APPLICATION PROGRAMMER

The Application Programmer will import, test, modify, install, and document VLSI design software from other organizations. A knowledge of software engineering techniques and programming practices in a language with modern control structures is required. Knowledge of digital IC design and UNIX is desirable. Applicants must have a master's degree in computer science or a bachelor's degree with programming experience.

Send resume to Dr. Peter Calingaert, Vice-President, Dept. F, Microelectronics Center of North Carolina, P.O. Box 12889, Research Triangle Park, NC 27709. Equal Opportunity Employer.

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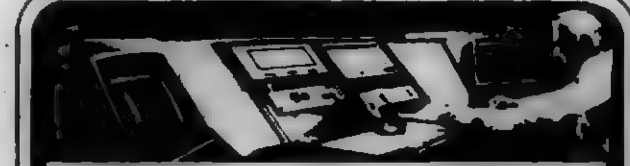

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- **Assemble price list cost information**
- **Prepare promotional material**
- **Follow-up on field problems**

Successful applicants will have a technical degree; experience in sales and/or product management; an indepth knowledge of data communications; and an ability to work independently as well as with engineering and manufacturing management. Specific experience with analog or baseband modems or with programmable concentrators/multiplexers highly desirable.

These highly visible positions offer excellent salaries and growth opportunities. Qualified candidates should forward resume **with salary history and requirements**, indicating position desired, in strictest confidence to:

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General DataComm
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INFORMATION SYSTEMS SPECIALIST

Albany, Georgia Location

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- Provide consulting, guidance and support to users in the purchase and usage of computer hardware, software and related equipment.
- Provide information retrievals for users of all computers including IBM-PC, IBM 303X (OS/TSO), ALTOS, BASIC/FOUR, etc.

REQUIREMENTS:

- BS in business, computer science, math, engineering, accounting or other business related field.
- 2-3 years micro experience in business environment.
- Fluency in BASIC/MARK IV/EASYTRIEVE/PASCAL, etc.
- Familiarity with microcomputer hardware and software and suppliers.

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Send resume to:

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Snack-master Division
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Will have overall responsibility for operating systems and support of layered products for multiple VAX/VMS systems. Position will involve leading a team of support specialists whose primary goal is providing high performance/reliability for all installed VAX systems. Duties include planning new systems installation, implementing new operating systems and features, and system tuning. Position requires at least 5 years of operating systems support experience in an engineering or service bureau environment where the key objective is effective customer service. At least 2 years of VAX experience also required.

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Will lead a team of support specialists involved in providing a highly reliable network which delivers best achievable performance. Duties include topology planning, performance measurement/analysis, network troubleshooting, and interface with data center users to define new system implementation. Requires at least 5 years of experience with operating systems support and maintenance, preferable in an end user environment. Ideal candidate will have 2 or more years of DECNET experience in a VAX and DECSYSTEM 20 environment.

TEAM LEADER AND SOFTWARE SPECIALIST (DECSYSTEM 20/TOP-20)

Team leader will be responsible for providing high performance/reliability for all installed TOPS-20 systems.

Software Specialist will contribute to operating system/support of layered products for multiple DECSYSTEM 20/TOPS-20 systems.

Both candidates will be involved in planning new systems installations, operating systems and features, and conducting performance analysis and system tuning.

Positions require at least 2 years of operating systems support experience in an engineering or service bureau environment. At least 2 years of TOPS-20 experience also required. DECNET experience, team leader background or operational experience in either a VAX or TOPS-20 environment preferred.

To apply, please send your resume and salary history to:

Fred Arno, Digital Equipment Corporation, Dept. 0214 3804, 200 Forest Street, Marlboro, MA 01752 or call COLLECT 617-467-6140 between 9 a.m. and 5 p.m. EST.

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Cody, Wyoming

Husky Oil, a fully integrated oil company, has an immediate opening in its Cody, Wyoming offices for an Application Programmer with 2 - 5 years OS/VS or related IBM experience. ADABAS experience is a plus.

If you are a COBOL programmer and your lifestyle could include a small city in the Rocky Mountain West, please send your resume and salary history to:

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SOFTWARE ANALYST

The Software Analyst will be responsible for the installation and implementation of complex software packages and provide technical support to DP operations. You will also troubleshoot software malfunctions and prescribe the proper corrective actions. Candidates for this position will have at least 2-3 years' software experience in a large IBM system with 5 years' experience in Data Processing. BS or BA degree required.

Anheuser-Busch can provide you with a career that will grow with your experience, interests and ambitions. While helping us maintain our momentum, you will receive the kind of advancement opportunities and compensation that reflects our commitment to remaining #1. For confidential consideration, forward your resume to: ANHEUSER-BUSCH COMPANIES, Corporate Employment, Department G-53-LB-CW, One Busch Place, St. Louis, Missouri 63118. An Equal Opportunity Employer M/F

ANHEUSER-BUSCH COMPANIES

SYSTEMS PROGRAMMER

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SR. SYSTEMS PROGRAMMER

Contribute your skills in a rapidly evolving environment. We seek an exceptionally qualified candidate to be responsible for the technical performance of all systems programs on our DEC-10 and for selection, installation and enhancement of software. Full knowledge of TOPS-10/20, MACRO and Database strongly preferred. (Exceptional candidates with experience in VAX/VMS may be eligible for training opportunity to serve in this position.) If you have 3-5 years' experience, are seeking an independent position loaded with challenge and new learning opportunities, apply immediately to the address below.

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We seek two candidates with 4-6 years' experience in COBOL who have strong project management/supervision skills. If your experience is particularly strong in finance/accounting or with a CODASYL database (such as DBMS), apply immediately to the address below.

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Central
New England
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Systems Programmer

Education: Associate Degree preferably in Data Processing Technology.

Experience: Minimum 4 years experience in programming medium to large scale computers. Strong IBM Assembler language (BAL) background. SYSTEMS SUPPORT EXPERIENCE IN ONE OF IBM'S OS OPERATING SYSTEMS

Responsibilities: Install, maintain and provide technical support for United Illuminating's Operating Systems (VM/SP and OS), associated program products (e.g. CICS, IMS) and a variety of installed software products.

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SR. PROGRAMMER ANALYSTS

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- **SOFTWARE ENGINEERS**

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RPG II Prog'r/Analyst	25K
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NCR COBOL Programmer	22K

Mail resume or call toll free: 800/633-6544. In Alabama call collect: 833-3467.

Ole Olson
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213 Gadsden Hwy.
Birmingham, AL 35235

Computer Science Faculty Position
Elizabethtown College

Faculty position open for fall 1983. Candidates in all areas including software engineering, systems analysis and design, and systems programming are sought. Candidates should have a strong interest in teaching and supervising undergraduate projects. A master's degree in computer science or a related field is required. Teaching and industrial experience will be advantageous. Rank and salary is competitive and commensurate with qualifications and experience.

Computer facilities include a DEC System 10, VAX 11/750, mini and micro computer laboratories and excellent access for students and faculty.

Send letter of application, resume, including curriculum vita, three references, and transcripts to Martin A. Farver-Agar, Director of Personnel, Elizabethtown College, Elizabethtown, PA 17022. For further information about the position, call Thomas R. Leap, 717-367-1151. Deadline for initial screening of applications, April 15, however, applications will be considered until position is filled. An affirmative action/equal opportunity employer.

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TECHNICAL CONSULTANT

Interfacing with our technical services, operations and applications teams, you will act as teacher/consultant with responsibilities that include management system design evaluation, technical vendor support as well as functioning as a troubleshooter for applications development projects. Minimum qualifications for this position includes 5-7 years' experience plus knowledge of COBOL, CICS, VSAM, OS/MVS and OS JCL.

ANALYST/PROGRAMMERS

Get involved in this growth-oriented, on-line systems area. We are looking for people who have had at least 3-5 years of COBOL programming experience and are familiar with an IBM environment, OS/MVS and CICS.

PROJECT MANAGER

You will manage a systems development team of programmers and analysts, having responsibility for both new development and maintenance production. Qualifications for this position include proven management experience in an IBM mainframe environment as well as previous experience in installing software packages.

We offer excellent salaries and the opportunity for advancement as well as a benefits plan that includes medical and dental insurances, an incentive savings plan and flexible hours.

Qualified applicants are invited to send their resumes, in confidence, to:

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Manager, Exempt Employment
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Immediate openings for COBOL programmers with 3+ years experience. Financial applications and Burroughs Thrift experience preferred.

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The successful candidate will have experience with telecommunications network and Burroughs medium system MCP in a technical support capacity. Familiarity with Burroughs Thrift Software or NCR experience would be considered a plus.

We offer:

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Martin Marietta Aerospace

Data Processing Opportunities

Martin Marietta Aerospace, NASA's prime Contractor for the Space Shuttle External Tank has immediate openings for Data Processing professionals. Because we actually manufacture the external tank, you'll get to see the actual results of your efforts.

COMPUTER PROGRAMMER/ ANALYSTS

Immediate opportunities exist for individuals experienced in:

- **UNIVAC 1100**
  - **ASC11 COBOL**
  - **DMS 1100**
  - **DDL, SDDL, DMU**
  - **DML, QLP**
  - **DPS 1100, TIP**
  - **D/B Editor**

- **APPLICATION EXPERIENCE**
  - **Shop floor control, Scheduling, Manufacturing, Inventory, Purchasing, Configuration Management, Quality, Engineering.**

- **DATA BASE OPENINGS**
  - **Analyst, Design, Administrators with above hardware, software and applications experience.**

These opportunities exist at our Michoud Assembly Facility located in suburban East New Orleans.

Qualified candidates interested in learning more about these opportunities at Martin Marietta should forward resumes, including salary history to: Martin Marietta Aerospace, Denver Glazier, CW-214, P.O. Box 29304, New Orleans, Louisiana 70189. We are an equal opportunity employer, m/f/h.

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Salary area $90,000

As this oil company's recognized leader you will direct and coordinate in-house and non-company (international) efforts in development of new seismic software. Attractions to this position include a competitive salary and bonus, travel plus an unlimited budget. You'll be assured international visibility in the geophysical community.

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Erie, Pennsylvania

The Smith Meter Division of Geosource Inc. has been setting the standard for accurate and reliable petroleum measurement as well as excellent careers. As a worldwide, high technology organization, Smith Meter Division manufactures liquid flow measurement and control equipment for the petroleum and chemical process industries, with new products continually being added.

Based in Erie, Pennsylvania, you will assure that the quality of new software for new electronic products will meet customer requirements, and prepare software required to perform job function. BS in Math, Software Engineering or Electrical Engineering and 5 years programming and testing language required. You must possess a familiarity with a Tektronix model 8002 system.

This position offers excellent benefits and salary plus relocation amenities. Please send resume to the Manager of Human Resources, Smith Meter Division, P.O. Box 10428, Erie, Pennsylvania 17614. We are an equal opportunity employer, m/f.

Smith Meter Division

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- 2-5 years COBOL programming analysis experience required.
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- Willingness to travel (20%) required for some positions.
- Work on the development, implementation and or maintenance of some of the nation's best health-care claims processing systems which process over $3 billion in claims per year.

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- 2-3 years COBOL programming analysis experience with IBM OS/JCL.

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- 2+ years systems programming experience.
- IBM Assembler language background.
- MVS JES 2 NJE internals • CICS VS internals • performance tuning and capacity management • VTAM and or TSO experience.
- Serve a data center which includes: IBM 168-3 • Amdahl 470 V6 • MVS-SP JES 2 with multi-access SPOOL • VTAM SNA network • IBM 3380 DASD • National APL time sharing system • Growth plans include installation of 3083 3033 CPU • RACF • Upgrade to APL2 • CICS 1.6.

THE COMPUTER COMPANY is located in historic Richmond, Virginia, a city with something for everyone. Richmond combines the charm of a small town with the cosmopolitan atmosphere of a big city. In addition, it's only 2 hours away from Washington, D.C., the Blue Ridge Mountains, Virginia Beach and all the fun that goes with them.

THE COMPUTER COMPANY offers competitive salaries, excellent company-paid benefits including life, health, and dental insurance, and professional growth opportunities. Please call or submit your confidential resume to:

JULIE K. DICKINSON
THE COMPUTER COMPANY
1905 Westmoreland Street Richmond, Virginia 23230
In Virginia, call collect 804-358-2171 Outside Virginia, call 1-800-446-2612

EQUAL OPPORTUNITY AFFIRMATIVE ACTION EMPLOYER

Tenure-Track Teaching Position

Washburn University has a tenure-track teaching position open in Computer Information System, beginning August, 1983. The University administration is committed to the development of an undergraduate center of excellence in C.I.S. thus the search is for exceptionally well qualified persons. Duties do not include teaching mathematics courses. This position offers exciting career opportunities with state of the arts hardware. Plans are underway for a new building to house the department and the academic computer center. Applicants must have a minimum Masters degree in C.I.S. or closely related field with expertise in most of the following areas: COBOL, Information Structures, Assembler, Operating Systems, System Analysis and Design, Data Base, Networking. Some industrial or commercial experience is required and collegiate teaching experience desirable. Salary is in the $28,000 to $32,000 range for the academic year. Additional compensation for summer teaching. Application includes resume, college transcripts, and names of three references. Deadline March 7, 1983 or until suitable applicant is found. Send to Dr. Richard E. Shermoen, Chairman, Department of Mathematics and Computer Information Sciences, Washburn University, Topeka, KS 66621. Detailed description of the position has been prepared and is available on request. If the information is desired before making formal application, please so request.

Washburn University is an equal opportunity/affirmative action employer.

DIRECTOR
of Data Processing
District Office
Salary $34,128-$42,984/Annual

Duties: Plans, organizes, directs and monitors operation of the district wide data processing center; performs related work as required in a CP6 Shop.

Experience: 6 years increasingly responsible broad range experience in development, installation, maintenance of electronic data processing systems, at least 2 years in the planning, direction, supervision of data processing staff.

Education: BA or BS (accredited college or university).

Deadline: March 14, 1983 at 5 p.m.

Inquire: State Center Community College District, Personnel Commission, 1525 East Weldon, Fresno, CA 93704 Phone (209) 226-0720.

FIELD ENGINEERS

Hartford Technical Services is seeking Senior Level 303X, 370, and 4300 X-IBM FE's with openings in Chicago, L.A., Houston, Detroit and Ohio. H.T.S. is a maintenance company that offers substantial savings and service to its maintenance customers. Salary and benefits commensurate with your expertise. If you are seeking a future and have these skills call:

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Hartford Technical Services, Inc.
515 East Gulf Rd.
Arlington Heights, IL 60005

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(713) 688-1800

Data Processing

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Responsible for the maintenance and performance tuning of the DOS/VS operating systems and CICS. Minimum of 2 years of college in a Data Processing curriculum or equivalent. 2 years of Data Processing experience as a Programmer. Knowledge of COBOL in assembler preferred. 1 year or more experience maintaining DOS/VS and CICS software. Salary upper $20's. Send letter of application and resume to Personnel Services.

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South Holland, Illinois 60473

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Our company offers an excellent opportunity to qualified individuals to join a growth oriented company in a challenging management position.

Minimum background requirements:

- BS degree. MBA preferred in related field
- 7 years experience in related field in an industrial manufacturing environment
- Comprehensive, hands-on knowledge of manufacturing cost structures and related performance analysis
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- In-depth knowledge of use of MIS
- Must be a self-starter, leader, developer and outstanding communicator.

We have available the following corporate position:

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Additional requirements include hands-on knowledge in systems design, development and evaluation with a corresponding understanding of hardware requirements and software applications. Responsible for planning, cost evaluation and effective interface with user departments.

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DATA RESOURCE CORPORATION, headquartered in Atlanta, is a leader in quality Contract Programming and Consulting. Our continued growth in the Southeast and Southwest has created opportunities for versatile Professionals with state-of-the-art skills in Programming and Systems Design.

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We can offer you competitive salaries and comprehensive benefits programs, including bonuses and profit sharing. If you've been searching for a growth opportunity with a dynamic and progressive company with a Management team that puts people first, then DRC is your answer.

For immediate consideration please call BECKY FINLEY at 1-800-241-6000, or send your resume to:

DRC
DATA RESOURCE CORPORATION
2301 Buckeye Rd.
Suite 103
Atlanta, GA 30341
(404) 455-7260

An EOE M/F

DATA PROCESSING MANAGER

Florida-based Regional airline is seeking a qualified Data Processing Manager to oversee their entire computer operations.

Responsibilities include managing and operating our in-house computer facility, interface with other on-line systems, initiating and maintaining plans that are responsive to our needs, system evaluation, analysis and design, programming and technical support.

Qualifications: Minimum five years experience with DEC PDP 11/44 equipment and familiarity with RSTS/E, BASIC PLUS, and DIBOL. B.A. required, M.A. preferred. Salary and fringes commensurate with experience.

Reply in confidence to:

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PBA
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Atlanta-based consulting firm currently staffing projects in Atlanta and Sunbelt. Candidates must be technically competent, have professional appearance, and good references.

- Several long term contract positions requiring current 'Q' security clearance. Large scale IBM/COBOL/CICS
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- Programmer Analyst(s)
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- Technical Writer
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- Several IBM system 34 or 38 contract positions
- Several IBM large scale systems programmer contract positions
- Long term contract for CORCS Programmer Analyst

For immediate consideration please call Pat Donahue collect at (404) 441-2165 or send resume to:

Drum/Donahue Inc.
Ste. 200
6780 Peachtree Industrial Blvd.
Atlanta, GA 30360

ANCHORAGE SCHOOL DISTRICT
4600 DeBarr Ave
Pouch 6-614
Anchorage, Alaska 99502
(907)269-2181

DATA PROCESSING MANAGER

$48,573 - $58,467 D.O.E.

The largest school district in the State of Alaska has immediate opening for the position of Data Processing Manager to create and manage a new data center assuming DP responsibilities currently contracted to a third party. Position will report to the Director, Management Information Systems, and will have planning and budgeting responsibilities in addition to managing the development, maintenance, and operation of data processing activities. Experience with educational data processing applications and IBM Systems is desired. Heavy emphasis will be placed on previous leadership experience. A Bachelor's Degree in Computer Science, Business Administration or related field desired with preference given to advanced degree. Two years experience in data processing is required. Experience as a project leader or as a shift supervisor is essential.

We offer a competitive salary and benefit package commensurate with education, experience and ability.

For application materials please contact the District's Personnel Services Division at the above address. Applications accepted through February 21, 1983. Resume required.

An Affirmative Action - EOE V/M/H/F
Application From Minorities Are Encouraged

ACADEMIC SYSTEMS SOFTWARE SPECIALIST

Academic Computing Services at The University of Wisconsin-Eau Claire is a rapidly growing department with a newly acquired Honeywell computing system. We are looking for someone to grow with us in the area of systems programming and operating systems maintenance. Requirements include a Master's Degree in Computer Science, appropriate experience in systems software design and maintenance, and good communication skills. Experience in academic computing and appreciation of the computing needs in a University environment are also important. Honeywell experience would be a plus. Eau Claire is a city of 52,000 in beautiful northwestern Wisconsin, just 90 miles from the Twin Cities. This full-time annual academic staff appointment begins as soon as possible. Salary is commensurate with training and experience and will be competitive with the salary structure found in an academic environment. Applications, including a resume, transcripts, and three letters of recommendation, should be sent by March 15, 1983 to:

J. Michael Yohe, Director
Academic Computing Services
UW-Eau Claire
Eau-Claire, WI 54701

The University is an Equal Opportunity Affirmative Action Employer

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MVS SYSTEMS PROGRAMMER

Cedars-Sinai Medical Center, the West's premiere medical center, seeks an experienced MVS Systems Programmer with in-depth knowledge of MVS/SP, JES2, CICS, ACF/VTAM/NCP, SMP4 and RACF. Must be capable of installation, tuning, and with operating systems conversions and capacity analysis a definite plus. Salary is in the low to mid 40's, and supported by a superior benefits package including three weeks vacation the first year. Submit resume to:

Mr. John Gilbert, Employment
C S M C
8723 Alden Dr.
Los Angeles, Calif. 90048
(213) 855-5529

SYSTEMS PROGRAMMER

The Dutchess County Office of Computer Information Systems offers an excellent opportunity for a Systems Programmer to grow in experience and help establish direction for the implementation of office automation, personal computers and other emerging technologies. Good communications skills required and previous application background desirable. Dutchess County is running a 4341 under VM/CMS and DOS/VSE with CICS, DL/1, DMS, VSAM, BTAM, SPM, JASPER, COBOL and Data Analyzer. Offering excellent benefits package. Salary low $30's. Send resume to: Dutchess County Personnel Department, 22 Market Street, Poughkeepsie, NY 12601. Dutchess County is an Equal Opportunity/Affirmative Action Employer.

Lead Programmer/ Analyst

Rapidly growing Medical Information Company with national network requires a lead programmer/analyst. 4 years experience and knowledge of PDP 11/VAX required. Send resume or call:

Robert A. Reid, M.D.
Commonwealth Clinical Systems, Inc.
405 Water Street
Charlottesville, VA 22901
(804) 977-1867

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  Electronic Engineer with digital logic design. TTL, CMOS and 8086 Assembler
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  P/A with RPGIII - Data Base helpful
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  P/A must have IMS DB/DC background
- **DEC/VAX**
  P/A with DATATRIEVE, BASIC and FORTRAN
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1-800-521-2144

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We are seeking Software Professionals with an educational background and/or previous experience in systems software on large-scale Vector Processors to play a key role in Sohio's effort to establish itself as the industry leader in exploration computing technology. Previous experience in the field of Vector Processing is required. Candidates should possess at minimum a BS in Computer Science, Mathematics, Geophysics or a related discipline.

Expertise in the following areas is desired:

- **Operating system internals and utilities**
- **I/O optimization techniques**
- **Job control languages and protocols**
- **Vectorization analysis of FORTRAN software**
- **FORTRAN compiler structure and internals**

Systems Software Professionals

Qualified candidates will possess previous experience on DECSYSTEM 36-BIT computer systems focusing specifically on the TOPS-20 and TENEX operating systems. Prior experience in the support and development of software tools in the TOPS-20 or TENEX environment is essential. UNIX background on VAX and/or PDP-11 systems desired, but not necessary.

Expertise in the following areas is desired:

- **Operating system internals and utilities**
- **Command language interface**
- **Foreign device software support**
- **Networking**
- **Performance analysis and tuning**
- **Compiler internals and environment.**

It's time to consider joining the Sohio adventure where the compensation package, including benefits, is outstanding. The opportunity for visability is unequaled and — to top it off — **Sohio has one of the best relocation programs in the industry.** To find out more, call or send your resume with complete salary history to: Dan Allman, SOHIO PETROLEUM COMPANY, 5400 LBJ Freeway, Suite 1200, One Lincoln Centre, Dallas, Texas 75240, (214) 960-4227.

SOHIO

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Principals Only Please!

SYSTEMS PROGRAMMER

Associated Wholesale Grocers, Inc., a 1.3 billion dollar grocery wholesaler in the Kansas City area is in need of a Systems Programmer with at least 3 years experience in a large IBM shop with MVS/SP environment. Candidate should have indepth knowledge and hands-on experience working with internals, including modifications, generations, and maintenance. Environment consists of an IBM 3083, MVS/OS, IMS/CICS, TSO/SPF, JES2, ACF/VTAM/NCP. The assignment includes network design, performance measurement and tuning. Degree or equiviant work experience required. Salary commensurate with qualifications and experience. Send resume to:

Human Resources Dept.
Associated Wholesale Grocers Inc.
5000 Kansas Ave.
Kansas City, Ks. 66106

EOE/MF

EDP OPPORTUNITIES

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FLORIDA SUN COAST

SYSTEMS ANALYST/ PROGRAMMER

Excellent career opportunity for a Systems Analyst seeking broader professional challenges and responsibilities. At Silor, you will quickly become a key member in a small but dynamic data processing team. You will also be joining a company recognized as being the leader in the manufacture of hard resin ophthalmic lenses.

This position will combine your analytical skills in systems design with "hands-on" programming responsibilities. Here's more:

- Your experience as an accomplished systems analyst is an absolute requirement. A working knowledge of manufacturing, inventory, and shop floor control systems is highly desirable.
- You must be willing to "roll up your sleeves" and take on direct programming responsibilities. Programming proficiency in structured Cobol is essential.
- You should be project-oriented with special emphasis on interpersonal skills. Clear documentation and well written procedures are equally important.
- A college degree in a job related discipline and APICS certification is highly desirable.

In addition to a progressive work environment, Silor offers an excellent benefit package along with a competitive salary structure. If qualified, please submit your resume, with salary requirements, in confidence, to:

Employee Relations Manager

SILOR OPTICAL
OF FLORIDA, INC.

4900 Park St. North
St. Petersburg, FL 33709

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P.O. Box 5013
Cherry Hill, New Jersey 08034
(609) 667-4488

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RSVP SERVICES

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These positions involve professional systems programming activities associated with the implementation of a VAX 11/780 based control system and professional specification and implementation of application and display programs to meet the operational needs of an 800 MeV accelerator. Positions will include both individual and team projects.

Successful candidates must have professional level programming experience working on large projects and demonstrated competence and effectiveness in software design and implementation in a team environment. Candidates must have a degree in computer science, physics or related field with a good academic record, or a substantial record of demonstrated relevant experience.

The Los Alamos National Laboratory is a multi-faceted national R&D facility operated by the University of California for the Department of Energy. We provide excellent working conditions and benefits such as 24 days annual vacation. Los Alamos has an excellent school system. Our location in the mountains of Northern New Mexico offers a casual lifestyle and ample recreational activities.

Please send resume in confidence to:

Jane C. Roberson DIV 83-E
Personnel Administration Div.
Los Alamos National Laboratory
Los Alamos, NM 87545

University of California
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Los Alamos, New Mexico 87545

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P/A	Micro Prgmg	To 45K
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Data Processing Specialist
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City of New Haven, Connecticut

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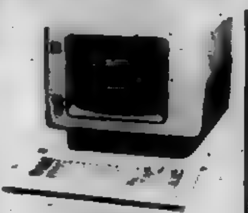

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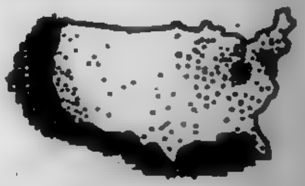

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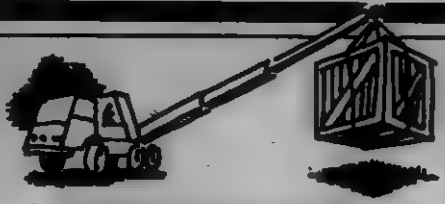

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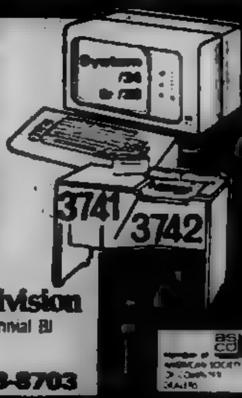

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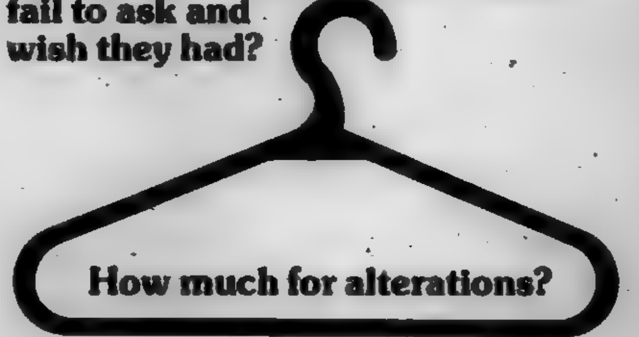
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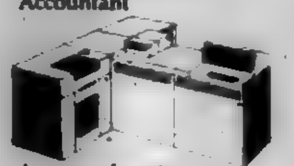

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ADVERTISERS INDEX

[illegible] Technology 41
ADP 60
Altos Computer Systems 110-111
Anasazi 12
Applied Data Research 3
Artificial Intelligence 9

BOS Computer Corp. 16
John Beall Company 137
Beehive International 53
B.I. Moyle Associates 107
BMC Software 30
M. Bryce & Associates 130
Bunker Ramo Corp. ID/9
Burroughs 22-23

Candle Corp. 96,116
Carleton Corp. 49
Centronics 88
Chubb Institute 90
Cincom Systems ID/4-ID/5
Codex Corporation ID/12-ID/13
Comdata 83
ComDesign 75
Computer Associates 5,26
Computer Corp. of America ID/31
Computeristics 37
Computer Language Research 26
Computer Management Research 70
Computer Software Consult 40
Computerworld Supplement 135
Concord Data Systems 80
Conference Management Group 130
Contel Info Systems 31
Control Data Corp. 48
Cord Cable Co. ID/28
CRWTH 53
C.S. Computer Systems 47
Cullinane 46
Curtis 1000 25
CW Buyers Guide 100
Cytrol 60

Data General 112-113
Datamation 10
Data Processing Design 81
Dataproducts ID/20
Dataroyal ID/16
Datasouth Computer Corp. ID/2
Decision Data 121
Deltak, Inc. 51,84
Digilog 84
Digital Associates 130
Digital Controls Corp. 97
Digital Equipment Corp. —Field Service 92
Digital Equipment Corp. —NPM-Peripherals ID/8
Digital Equipment Corp. —NPM VAX 78/79
Digital Equipment Corp. —Small Systems Group 126-127
Digital Pathways 25
Direct, Inc. ID/24
Dorlen Products ID/20
D.P. Facilities 38
Dysan Corp. 34

Eastman Kodak 136-137
E.E.C. Systems 90
Elgar Corporation 56
EMC 128
Emulex Corporation 107
Essential Software 71

Falco Data Products 106
Fibronics ID/9
Floating Point Systems 102-103
Florida Computer Graphics ID/23
Fusion Products ID/22

Gejac, Inc. 58
General Electric 27,88
G.E. Video 36
Graham Magnetics 138
G.R. Electronics 6

Hazeltine 125
Hewlett Packard 14-15
Hughes Aircraft 44
H&W Computer Systems 42

IBM 64,ID/19
INCOMM 100
Independent Computer Systems 97
Infodata 114
Informatics 122
Informatics Software 73-89
Information Science Inc. 54-55
Information Systems Consultants 77
Innovative Electronics 124
Inte-Com ID/18
Integral Data Systems 125
Internel 72
ISSCO 39

KW Control Systems 128

[illegible], Inc. 62
Lear Siegler 104-105
Lee Data Corp. 64
Liebert Corporation 136
Local Data 100
L.T.I. 34

Martin Marietta 89
Maxell-Computers 70-71
MCBA 17
Memorex Corporation 56
Mohawk Data Sciences 73,75,77
Money Magazine 99
Multiplications ID/7

National Advanced Systems 94-95
National Semiconductor 132-133
NCR Corporation 120
NCR/OEM Marketing Division 118-119
NEC Info. Systems ID/15
Newcorp Products 30
Newman Computer ID/14

Omni Offices 22
O.S.M. Computers 19

Perkin Elmer 101
Perrydata Systems 90
Phillips Info. Systems 62
Popcom ID/30

Qume ID/30

3R Computer 52
Radio Shack ID/29
RAMTEK 96

SAS Institute 68,ID16-ID/17
Saturn Systems 115
SDI 126
Signal Technology 38
Softech Microsystems ID/6
Software AG 109
Software Corp. of America ID/20
Software Module Marketing 75
Software Results 80
Software Tech. and Research 67
Southern Systems 13
Storage Technology 91
Stratus Computer 20,95
Synapse Computer 85
Syncsort 7
System Strategies 90

Tandem Computers 62-63
T and E Computing 100
Technicolor Audiovisual ID/30
Technology Transfer Institute 108
Teleray ID/32
Tolrs Computer Products 39
Texas Instruments 86-87
Thomas Engineering 73
Tominy, Inc ID/26
Tone Software Corp. 140
TSI 45

Ungermann-Bass 8
United Airlines 66-67
United Telecomm 43
Universal Data Systems 58
University Computing Co. 20-21
U.S. Data Systems ID/22

Verbatim 130
VM Software, Inc. 76

Wadsworth Electronic Publishing Co. 100
Walker Interactive Products 48
Wang Laboratories ID/25
Whitesmith LTD 40
Wild Hare Computer Systems 142
Wright Line ID/3

Zilog Inc. 30-33

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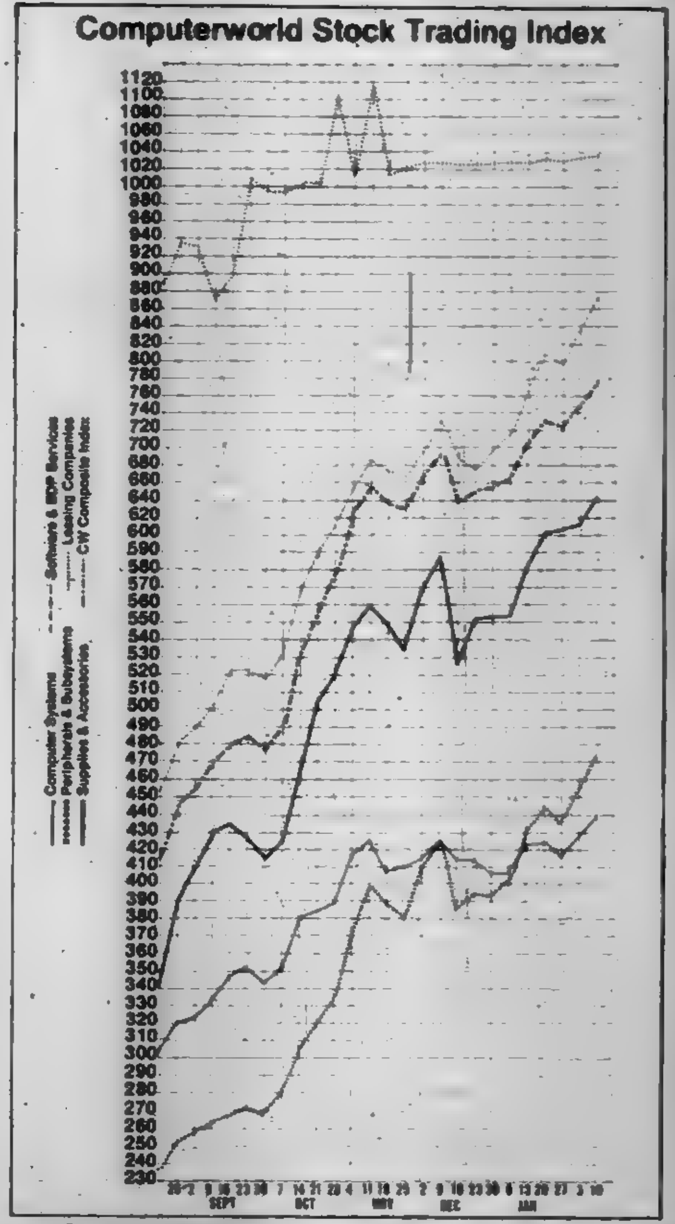

Computerworld Stock Trading Index

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CLOSING PRICES WEDNESDAY, FEBRUARY 9, 1983

*All statistics compiled, computed and formatted by TRADE QUOTES INC. Cambridge, Mass. 02139

EXCH		PRICE 1982-83 RANGE (1)	CLOSE FEB 9 1983	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
A	AMDAHL CORP	17- 41	40 1/8	+4 1/8	+11.4
N	BURROUGHS CORP	28- 48	48	+2 3/4	+6.3
O	COMPUTER AUTOMATION	7- 17	15 1/2	+1 5/8	+11.7
N	CONTROL DATA CORP	21- 48	44 1/4	+1 1/2	+3.5
N	CRAY RESEARCH INC	20- 47	47 3/8	+4 5/8	+10.8
N	DATA GENERAL CORP	20- 58	48 7/8	+2 1/4	+4.7
N	DATAPOINT CORP	11- 34	21 3/4	+1	+4.8
N	DIGITAL EQUIPMENT	62-122	116 3/4	-1 1/2	-1.2
A	EECO INC	6- 11	10 7/8	+1 1/8	+11.5
N	ELECTRONIC ASSOC.	5- 12	10 1/8	0	0.0
N	FLOATING POINT SYST	18- 38	32 7/8	0	0.0
N	FOXBORO	22- 40	37 1/4	+1	+2.7
O	FULCRUM COMP GRP	1- 3	1/4	0	0.0
O	GENERAL AUTOMATION	3- 8	7 3/8	+1 3/8	+22.8
N	HARRIS CORP	20- 44	43 1/4	+2 3/8	+5.8
N	HEWLETT-PACKARD CO	38- 84	81	+2 3/8	+3.0
N	HONEYWELL INC	60-104	88 5/8	+ 7/8	+0.8
N	IBM	48-100	94 1/2	-1 1/2	-1.5
O	IPL SYSTEMS INC	5- 9	9 1/4	+2 1/2	+37.0
O	MAGNUSON COMP SYSTS	2- 16	2 3/8	+ 3/8	+18.7
N	MANAGEMENT ASSIST	7- 18	15	- 3/8	-2.4
O	MINI-COMPUTER SYST	1- 4	1/2	- 1/8	-20.0
N	MODULAR COMPUTER SYS	6- 15	13 7/8	+2	+16.8
O	MOHAWK DATA SCI	10- 18	17 3/8	+1 1/4	+7.7
N	NCR	58-100	95 1/8	+1 5/8	+1.7
N	PERKIN-ELMER	17- 33	31 3/8	0	0.0
N	PRIME COMPUTER INC	15- 44	41 3/8	+ 5/8	+1.5
N	SPERRY CORP	21- 38	37 1/2	0	0.0
O	TANDEM COMPUTERS INC	14- 34	28 1/8	-2 3/8	-8.3
N	TEXAS INSTRUMENTS	71-176	162	-4 1/2	-2.7
A	WANG LABS "B"	13- 35	32 1/2	+ 3/8	+1.1
A	WANG LABS "C"	11- 34	33 1/8	+1	+3.1
	LEASING COMPANIES				
O	BOOTHE FINANCIAL CP	22- 30	29 1/2	0	0.0
N	COMDISCO INC	13- 46	44 1/4	+ 3/4	+1.7
O	COMMERCE GROUP CORP	1- 1	1/4	0	0.0
O	COMPUTER INVSTRS GRP	1- 2	3/8	0	0.0
O	CONTINENTAL INFO SYS	5- 20	17 3/4	0	0.0
N	DPF INC	5- 13	12	+1 3/8	+12.9
O	ITEL	1- 5	3/4	0	0.0
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	18- 40	40 1/8	+ 5/8	+1.5
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 6	3 1/2	0	0.0
O	ADVANCED SYSTEMS INC	9- 23	21 1/2	+ 1/4	+1.1
O	AGS COMPUTERS INC	7- 21	20 1/4	+1	+5.1
N	ANACOMP INC	8- 20	18 3/4	+1 3/4	+9.7
O	ANALYSIS INTL CORP	5- 9	9	+ 1/2	+5.8
A	APPLIED DATA RES.	16- 44	43 3/4	+ 1/4	+0.5
O	ASK COMPUTER SYSTEMS	12- 31	30 5/8	+1	+3.3
O	ASTRADYNE COMP IND	1- 5	4 3/8	+ 1/2	+12.9
N	AUTOMATIC DATA PROC	21- 38	33 5/8	+ 1/8	+0.3
O	CGA COMPUTER ASSOC	5- 13	12 1/4	+1	+8.8
O	COMPUTER ASSOC INT'L	12- 44	44 1/4	+1	+2.3
O	COMPUTER HORIZONS	1- 3	10	+ 3/4	+8.1
O	COMPUTER NETWORK	4- 9	8	+ 7/8	+12.2
N	COMPUTER SCIENCES	11- 21	21	+1 1/8	+5.6
O	COMPUTER TASK GROUP	8- 18	16	+ 3/4	+4.9
O	COMPUTER USAGE	2- 13	12 1/2	+3 1/4	+35.1
O	COMPUTONE SYSTEMS	13- 37	37 1/4	+8 1/4	+28.4
O	COMSERV CORP	11- 20	17	+1	+6.2
O	COMSHARE	8- 10	9	+ 3/8	+4.3
N	CULLINET SOFTWARE	12- 35	31 3/4	+ 1/2	+1.6
O	CYCARE SYSTEMS INC	8- 18	15 1/2	- 1/2	-3.1
O	DATA DIMENSIONS INC	1- 3	1/4	0	0.0
O	DATATAB	0- 4	7/8	+ 1/8	+16.6
O	DYATRON CORP	2- 4	3 1/8	- 1/8	-3.8
N	ELECTRONIC DATA SYST	19- 51	50 1/2	+4 1/4	+9.1
O	INFORMATICS INC	10- 25	24 1/2	- 3/4	-2.9
O	INSYTE CORP	1- 3	2 3/8	0	0.0
O	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	4- 8	7	0	0.0
A	LOGICON	12- 32	32 1/8	+2 1/4	+7.5
O	MGMT SCI AMER INC	8- 28	24 1/4	-3	-11.0
O	MATHEMATICA INC	12- 20	17	-1 1/2	-8.1
O	MATHEMATICAL APP GRP	12- 18	18	- 1/2	-2.7
O	NATIONAL DATA CORP	13- 28	20 5/8	+1 1/4	+6.4
O	PANSOPHIC SYSTEMS	8- 23	22 3/4	+2 1/4	+10.8
N	PLANNING RESEARCH	6- 14	13 1/2	+1	+8.0
O	PROGRAMMING & SYS	1- 4	3 5/8	- 1/4	-6.4
O	REYNOLDS & REYNOLDS	17- 38	35 1/2	0	0.0
O	SEI CORP	21- 50	49 1/4	+ 1/2	+1.0
O	SHARED MEDICAL SYST	13- 28	27 1/2	+ 7/8	+3.2
O	SCIENTIFIC COMPUTERS	8- 13	12 1/4	+1 1/4	+11.3
O	SOFTWARE AG	5- 17	11 1/8	- 3/8	-3.2
N	TYMSHARE INC	12- 30	22 3/8	+1 3/4	+8.4
A	URS CORP	10- 20	19 1/4	+1 1/8	+6.2
N	WYLY CORP	7- 13	8 5/8	- 3/8	-3.7
	PERIPHERALS & SUBSYSTEMS				
N	AM INTERNATIONAL	1- 15	3 1/2	+ 3/4	+30.2
A	ANDERSON JACOBSON	9- 26	21 1/2	- 3/4	-3.3
O	AUTO-TROL TECHNOLOGY	9- 21	20 1/8	+2 7/8	+16.6
O	BANCTEC INC	7- 23	18	+ 1/2	+2.7
A	BEEHIVE INT'L	4- 10	8 1/4	- 1/2	-3.1
A	BOLT,BERANEK & NEW	9- 38	38	+3 3/8	+9.7
O	CAMBEX CORP	2- 4	2	0	0.0
N	CENTRONICS DATA COMP	6- 18	18 3/8	- 3/4	-4.3
A	CETEC CORP	4- 8	7 3/8	+ 1/2	+7.2
O	COGNITRONICS	2- 12	8 5/8	- 5/8	-6.0
O	COMPUTER COMMUN.	1- 2	3/4	0	0.0
A	COMPUTER CONSOLES	15- 44	38 1/8	-3 3/8	-8.1
O	COMPUTER DEVICES INC	4- 21	15 3/8	+2 1/8	+16.0
O	COMPUTER TRANSCEIVER	4- 9	9	+1 1/4	+16.1
N	COMPUTERVISION CORP	18- 49	41 1/4	+ 7/8	+2.1
A	COMPAC CORP	21- 36	34	- 1/4	-0.7
A	DATA ACCESS SYSTEMS	2- 5	1 1/8	0	0.0
A	DATAPRODUCTS CORP	18- 40	36	-3	-7.6
A	DATARAM CORP	9- 15	11	- 3/8	-3.2
O	DATUM INC	2- 9	8 7/8	+ 3/8	+4.4
O	DAVID JAMISON CARLYL	2- 7	4 3/4	+1	+26.6
O	DECISION DATA COMPUT	3- 14	13 3/8	- 1/4	-1.8
O	DELTA DATA SYSTEMS	1- 3	2 3/4	+ 7/8	+46.6
N	ELECTRONIC M & M	5- 8	6 3/8	+ 1/8	+2.0
O	EVANS & SUTHERLAND	18- 50	48 1/4	+3 1/2	+7.6
O	GANDALF TECHNOLOGIES	10- 22	15 5/8	- 1/4	-1.5
A	GEN'L DATA COMM INC	6- 22	17 3/8	- 5/8	-3.4
O	GENERAL TERMINAL CP	0- 4	5/8	0	0.0
O	GREAT SOUTHWEST IND	2- 8	3 3/4	- 1/4	-6.2
N	HAZELTINE CORP	22- 58	56 3/4	-3 1/8	-6.3
O	ICOT CORP	3- 8	8 1/2	- 1/8	-1.4
O	INFORMATION INTL INC	10- 22	19 3/4	+ 3/4	+3.9
O	INTEL CORP	21- 46	44 1/4	+ 3/4	+1.7
O	IPL SYSTEMS INC	2- 9	9 1/4	+2 1/2	+37.0
A	LUNDY ELECTRONICS	7- 19	14 3/4	+ 1/4	+1.7
A	MSI DATA CORP	14- 38	23 1/2	-1 3/8	-5.5
O	NETWORK SYSTEMS CORP	15- 42	38 7/8	+ 1/2	+1.3
O	OMEX	3- 8	3	0	0.0
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O	RAMTEK CORP	12- 23	22 1/2	+2 1/2	+12.5
N	RECOGNITION EQUIP	4- 12	11 1/2	- 1/4	-2.1
O	SCAN DATA	1- 5	1 3/8	0	0.0
N	STORAGE TECHNOLOGY	18- 48	22 1/4	+ 1/8	+0.5
O	SYKES DATATRONICS	8- 34	12 3/4	-1 3/8	-10.0
A	T BAR INC	7- 13	12 3/8	- 3/8	-2.9
A	TEC INC	4- 12	8 3/8	-1	-10.6
N	TEKTRONIX INC	34- 72	70 1/4	+4	+6.0
N	TELEX	9- 27	23 1/8	- 3/8	-1.5
O	TESDATA SYSTEMS CP	3- 10	7 3/4	- 1/4	-3.1
A	TIMEPLEX INC	7- 24	21 3/8	- 3/8	-1.7
O	VISUAL TECHNOLOGY	9- 18	17	- 3/4	-4.2
O	WILTEK INC	1- 3	2 3/8	+ 5/8	+35.7
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N	AMERICAN BUS PRODS	11- 21	20 3/8	+2	+10.8
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N	3M COMPANY	49- 80	76 1/4	+ 1/2	+0.6
N	MOORE CORP LTD	28- 48	44 1/2	+1 3/4	+4.0
N	NASHUA CORP	8- 18	10 1/4	- 1/8	-1.3
O	STANDARD REGISTER	32- 72	69	-1 1/2	-2.2
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Proposals Narrow Qualifying Projects

Software R&D Tax Credit Rocky

By Bill Laberis
CW Staff

A provision of the Economic Recovery Act of 1981 that was expected to give both users and vendors a 25% research tax credit for software development may be in trouble.

Recently published proposals of the Internal Revenue Service appear to limit severely the types of software development — in-house or otherwise — that can qualify for the tax credit. It was widely believed that the research credit would be applied to a broad range of software development projects undertaken by users and vendors [CW, June 28].

The IRS has stressed that the rules are merely proposals and were extracted verbatim from other proposals hashed out in Congress when it formulated the Economic Recovery Act. Nonetheless, both software users and developers contacted this month made it clear they do not care much for what they have seen and are intent on making their sentiments felt at hearings on the matter next month.

"My biggest objection is that these rules should give us guidance. I read them, and I didn't come away with a whole lot of guidance," said George J. Yost III, a partner at the accounting firm of Coopers & Lybrand in Boston.

"They define the term 'research costs' to exclude any 'development costs of software where the operational feasibility is not seriously in doubt,'" Yost said. "The rules go on to say that the programming itself should involve a significant risk that it cannot be written [to qualify for the tax credit] . . . Why would you undertake such a project in the first place? It makes no sense."

According to the proposed IRS rules, "the costs of developing computer software are not research or experimental expenditures" and therefore do not qualify for the credit.

"However," the rules continue, "the term 'research or experimental expenditures' includes the programming costs paid or incurred for new or significantly improved computer software. The term does not include costs paid for the development of software, the operational feasibility of which is not seriously in doubt."

In addition, "the costs of modify-

(Continued on Page 6)

Honeywell Expands Large-System Line

By Susan Blakeney
CW Staff

PHOENIX — Honeywell, Inc. recently expanded its large-scale mainframe line by adding two systems and introducing an enhanced version of its top-of-the-line Multics system, the DPS 8/70M. The company also announced:

- Two entry-level models of its large-scale systems running under both the Gcos 8 and CP-6 operating systems.
- An enhanced version of Gcos 8 for the DPS 8 and DPS 88 hardware line (story on Page 7).
- A family of Personal Data Query software tools for information retrieval and report-writing functions (story on Page 7).
- Price cuts ranging from 25% to 50% on a number of its CPUs, memory modules and system upgrades (story on Page 7).

The two additions that Honeywell made to its large-scale DPS 8M processor family earlier this month are the DPS 8/52M and DPS 8/62M. Both run under Multics and reportedly feature a base system to which performance modules can be added.

The DPS 8/52M is field upgradable to a DPS 8/62M, which can be upgraded to the enhanced DPS 8/70M, for which the standard amount of main memory has been increased from 2M to 8M bytes. No reprogramming, operating system changes or regenerations are required for these

(Continued on Page 6)

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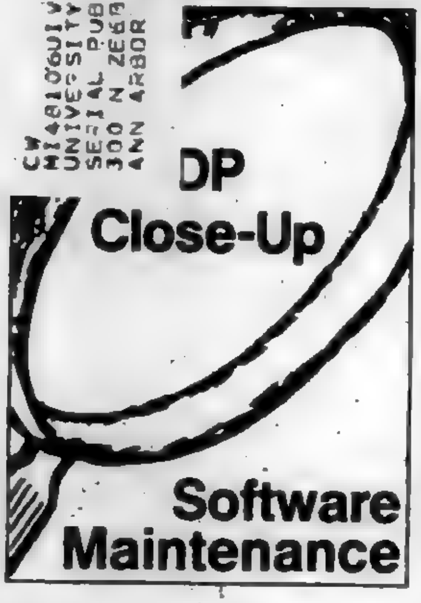

It Keeps Costing More and More

By Paul Gillin
CW Staff

DP managers beware. DP expenditures on software maintenance have steadily crept up over the last five years to the point, experts say, where the average shop now devotes about 50% of its total software budget to maintenance. Figures of up to 90% are not uncommon.

DP managers are now wrestling with the dilemma of whether to restructure entirely their applications or to opt for the short-term alternative of patching up bearish programs until time and budget permit a changeover.

Many DP shops have undertaken a variety of programs to contain maintenance costs (stories on Page 8). However, experts warn that managers who ignore the rising costs of maintenance could be faced with an expensive crisis within a few years.

"[DP managers] are aware of the problem, but with the explosion of new technology, they have a lot to

(Continued on Page 8)

No, They're Not Disk Packs

They're stacks of pots for plants that will decorate Security Pacific National Bank's $100 million information processing center in Brea, Calif., which is set to open on March 15. The bank believes the center represents a departure from the usual computer operations organization. Story on Page 12.

Proprietary Language Snags $3 Million Budget System

By Jeffry Beeler
CW West Coast Bureau

SAN JOSE, Calif. — Major shortcomings continue to plague a $3 million budgeting and accounting system that a county government here has already spent more than three years trying to install and modify to suit its needs.

The performance of Santa Clara County's three-year-old Comprehensive Budget and Management Information System has proven so unsatisfactory that the county is considering extensively rewriting or possibly even replacing CBMIS' software. Chief among the system's drawbacks is its unexpectedly high cost of operation, now estimated at $2 million annually, according to the county's fiscal services manager, George Rixman.

Much of the system's high operating cost is attributable to the "inefficiency" of its programming language, Rixman said. Known as the General Financial System, the language is proprietary to American Management Systems, Inc., the Arlington, Va.-based vendor that wrote CBMIS' software from scratch.

"AMS wanted to use its own language with the system rather than an industry standard like Cobol so that when changes had to be made in the programs, only the vendor could do the job," Rixman said. After all, he added, "the county just can't go out and hire a GFS programmer off the

(Continued on Page 6)

Bell-Ansi Feud Stalls Videotex

By Phil Hirsch
CW Washington Bureau

A battle between AT&T and the American National Standards Institute over a pending standard threatens to squelch the emerging U.S. market for videotex systems.

The proposed standard is the North American Presentation Level Protocol Syntax (NAPLPS). AT&T has applied for patents on NAPLPS' underlying technology.

Ansi will not promulgate a standard based on patented technology unless the patent is licensed to the public on reasonable terms. AT&T's unregulated subsidiary, American

(Continued on Page 4)

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& SALES OFFICES:

New York: Suite 7G, 401 East 80th St., New York, N.Y. 10021 Phone (212) 570-2135

West Coast: 257 Lytton Ave., Palo Alto, Calif. 94301 Phone (415) 328-6064

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England: Bill [illegible] Stephen Thomas, [illegible] London [illegible]

W. Germany: [illegible] CW Publikationen [illegible] Munich [illegible] Phone [illegible]

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Honeywell Ends Inmate Training

By Patricia Keefe
CW Staff

WALTHAM, Mass. — Honeywell, Inc. has decided to end an innovative DP inmate training program initiated in Massachusetts prisons 16 years ago.

The DP training program had graduated at least 650 inmates who found employment within the computer industry after they were released from prison, according to Honeywell figures. In addition, the program received national acclaim as a model rehabilitation program, and Honeywell received a presidential award for its efforts.

"We determined that the needs of the program and its overall effects had changed," Honeywell spokeswoman Sandy McLaughlin explained here last week.

Enthusiasm Waned

Inmate movement throughout the prison system, which jumped about 31% last year over 1981's figures, according to the Massachusetts Department of Correction (DOC), had resulted in a lower percentage of students completing the program, and Honeywell's enthusiasm for the training program waned as a result.

Honeywell also apparently lost interest in the program following a midnight raid last year on a suspected drug and gambling ring that was allegedly being operated out of the Framingham, Mass., State Prison's computer training facility [CW, Jan. 11, 1982].

The purpose of the training program was to teach inmates good business practices and the fundamentals of data processing.

However, after the January 1982 raid on the Framingham facility, in which records from the inmate service bureau, Con'puter Systems Programming, were seized and its operation terminated, the DOC "temporarily suspended the entire DP training program for review purposes," DOC spokeswoman Lorraine Carli said.

DOC gave Honeywell officials the authority to reopen the program, but the company chose not to, she added.

The DOC has no plans to begin a similiar program in the future. "We were sorry to lose the program. It was very worthwhile," Carli said.

Because the program had been suspended after the Framingham raid, it had no enrollees. Honeywell's decision, therefore, did not inconvenience any current students.

However, a spokeswoman for the Northeastern University School of Law's Prisoner Assistance Project, Denise Sudell, said it was "very unfortunate" that the program would be discontinued.

Chance for Better Life

"It was one of the very few training programs that gave prisoners a meaningful chance to go on to a new and better life on the outside. Its removal cuts down on that chance."

DP training at several Massachusetts prisons began in 1967 at Walpole State Prison with the donation of equipment from Honeywell and, later, from Digital Equipment Corp. Honeywell volunteers guided inmates through a three-phase program lasting approximately nine months, complete with testing at various levels and then presented students with certificates.

Under the program, graduates were required to teach a programming class to other interested inmates. Honeywell conducted all the testing.

Con'puter Systems Programming was developed in 1976 in Framingham after the inmates began making money through various contracts with state agencies.

Today, however, the computer room at Framingham state prison is closed. DP training is no longer available to inmates at that institution or to others at Walpole, Bridgewater and Norfolk.

Honeywell expects to have all of its donated equipment out of the prison system by March, according to Honeywell's McLaughlin.

Charges Dropped

CAMBRIDGE, Mass. — A Middlesex County Superior Court judge has dismissed charges against five former Framingham state prison inmates accused of failing to file state income tax and partnership returns here.

The charges stemmed from a January 1982 drug and gambling raid on the Framingham facility and its inmate-run, profit-making computer service bureau, Con'puter Systems Programming (CSP) [CW, Jan. 11, 1982].

The five inmates were partners in CSP, a spinoff of a DP training program jointly sponsored by the Massachusetts Department of Correction and Honeywell, Inc.

The charges against the five defendents — Susan E. Saxe, Benjamin DeChristoforo, Richard Quillen, Kenneth Chapin and George McGrath — were dismissed Jan. 29 after the Middlesex County District Attorney's office was unable to comply with an order to produce all exculpatory evidence for the defense, according to Middlesex County Assistant District Attorney Carol Ball. Exculpatory evidence is any evidence that has a tendency to clear, justify or excuse a defendent of alleged guilt and is the absolute right of the defense.

According to Ball, the gathering of the exculpatory evidence was "such a colossal bureaucratic and administrative undertaking" that the prosecution was unable to comply with the order.

This Week

IN DEPTH

Interview With Clive Sinclair ....Follows Page 46
The Psychology of Professionals: Two Views ID/6

NEWS

IBM, Matsushita Talking About Joint Venture 5
Data General Reduces Eclipse MV/8000 Prices 6
Communications Facilities Update Gcos 8 7
Methods Detailed to Control Maintenance Costs ...8
Communications Tools Still on Hold: Survey 10
First Link Complete in AT&T Fiber-Optic Net 11
Bank Set to Open $100 Million Data Center 12
User Not Sorry It Served as TP Monitor Test Site ..13
Service to Predict Congress' Votes via Data Base .14
An Interview With George R. Stibitz 15
Micros Seen Receiving Mixed MIS Reception 17
Micro Fears Said Haunting MIS Groups 18
Japan's Public Schools Seen Remiss in DP Field ..19
First User of T/S Payroll/Personnel Cites Savings ..20
High-Tech Autos Stop the Show 23
Patriotism a Small Part in IBM Choice: Officials 24

EDITORIAL

Editorial: A Friend of Ours? 28
Lecht on Science: The 'Information Bottleneck' ...29
Human Connection: College-Industry Relations ...29

SOFTWARE & SERVICES

Insurer Navigates Language Change 31
'File-Aid,' 'Abend-Aid' Out 32
Gould Unix-Related Ada, Pascal Compiler Out 36
Release Allows Access to Power/VS(E) Files 37
CICS File Utility Announced 38

COMMUNICATIONS

Report Reveals Solutions to Net Problems 41
Displayphone Enhanced 42
Hydra-II Controller Out 43

SYSTEMS & PERIPHERALS

MDS Bundles 'Express,' Targets OA 47
Medical Manager Offered 48
Microfiche Recorder Updated 50

OFFICE AUTOMATION

Need for Quality Micro Software Seen 53

COMPUTER INDUSTRY

What to Do With $5 Billion? 55
R&D Called Chip Makers' Lifeblood 55
IBM Seen Narrowing Competitors' Horizons 57
STC Earnings Show Decline of 21% Over 1981 ...60
GAO: Repeal Service Contract Act 61
Brock Launches Defense of Open Trade Policy 62
IBMer Says Micro Users Want 3270 Emulation 64
ADVERTISING INDEX 90

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AT&T Holding Tight to Videotex Patent Data

(Continued from Page 1)

Bell, Inc. (the telephone company's chief point of contact with Ansi on NAPLPS) has verbally agreed to comply with Ansi's requirement, but has not said explicitly that the patents will be licensed.

"We must first be sure that no one else has applied for or received a patent on any of the technology included in our application," Dennis J. Sullivan Jr., American Bell's vice-president for consumer information services, explained last week. Without this determination, he said, the company could be sued by another inventor if it began licensing NAPLPS.

Although the U.S. Patent & Trademark Office has been asked to search its files, this will take about six months. "Maybe a little less, maybe a little more," Sullivan said.

But Ansi cannot wait six months. "Timing is all-important," said Tom Hastings, head of the group that drafted NAPLPS. "Once manufacturers invest in nonstandard circuitry, getting them to agree on a common approach enabling competing systems to talk to each other is extremely difficult."

Ansi plans to adopt NAPLPS as an official U.S. standard by the end of May. The draft is now out for public comment. According to Hastings, if American Bell does not agree to license its technology on nondiscriminatory terms before May 21, when the public comment period ends, competitors are likely to develop alternatives that sidestep American Bell's proprietary technology and are incompatible with each other.

This is expected to dampen enthusiasm for videotex among providers of videotex services. Not only would incompatible terminals cost them more, but whatever system they choose would reach fewer end users.

Hastings insisted that American Bell can meet Ansi's requirements without waiting for the patent search; all the company has to do is specify reasonable terms for the use of its NAPLPS patents once they are granted. Asked whether this would solve the problem, American Bell attorney Richard Evans declined to answer directly and would say only that American Bell plans to respond officially "within the next few weeks" to Ansi's request for licensing of NAPLPS on reasonable terms.

Evans indicated the statement will affirm American Bell's intention of complying fully with the standards group's request. He added, however, that "until we know whether the patents are going to be issued, we can't license the technology."

Ansi's Hastings made it clear that a statement of intentions would not provide the kind of commitment Ansi needs before May 21.

Another Version

One version of the controversy swirling around the proposed North American Presentation Level Protocol Syntax (NAPLPS) standard comes from AT&T, which maintains that it cannot comply with the American National Standards Institute's (Ansi) request to license its NAPLPS-based patents on reasonable terms until its patent claims are validated.

But another version is that the telephone company is not disclosing the underlying NAPLPS technology because it wants to prevent its competitors from getting to the market first with better videotex systems.

The latter view is held by Bill Frezza, a member of the Ansi NAPLPS standardization group. Frezza, a former Bell Laboratories employee, is one of the inventors of the NAPLPS technology that AT&T is now trying to patent. He currently heads a team at General Instrument Corp.'s Jerrold Division that is developing an NAPLPS-compatible terminal family.

"AT&T knows that its competitors won't make a significant investment in NAPLPS until they are sure they won't have to pay an arm and a leg for use of the technology," Frezza said in a recent interview. But another, even stronger indication of the phone company's intentions, according to Frezza, is a lawsuit that Bell Labs has filed against General Instrument and two of its employees who formerly worked at the labs.

These employees — Dr. John Gaby and Arthur Mansky — worked on the videotex frame-creation terminal that American Bell, Inc., AT&T's unregulated subsidiary, recently began marketing. Bell has alleged that they are incorporating ideas and information stolen from Bell Labs into General Instrument's upcoming Communicom terminal.

Earlier this month, the judge hearing the case issued a temporary injunction barring Gaby and Mansky from working on the Communicom project until May 1.

According to Frezza, General Instrument had planned to display an engineering prototype of the Communicom terminal at the National Cable Television Association's annual convention next June in Houston (commercial models are scheduled to be available "by the summer of 1984"). With the injunction on Gaby and Mansky, however, Frezza is uncertain if the prototype can be built in time.

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Would Add Manufacturing Capacity

IBM, Matsushita Talking About Joint Venture

By Bill Laberis
CW Staff

ARMONK, N.Y. — In a move that observers say may have been spurred by a need for greater manufacturing capacity, IBM announced last week that it will hold "detailed discussions" with Matsushita Electric Industrial Co. of Japan to establish a joint manufacturing venture. The venture's mission, IBM said, will be to develop low-cost, high-volume computer terminals, office automation equipment and small business systems.

IBM currently buys parts from other U.S. and Japanese vendors for many of its products, but it does not have a significant vendor-to-vendor relationship under which another company makes and supplies finished products bearing the IBM label.

With annual sales of $10.6 billion last year, Matsushita is the world's largest consumer electronics company. It operates under such trade names as Panasonic, Quasar and Technics.

Mid-'83 Announcement?

Discussions with Matsushita began several months ago, an IBM spokesman said, but he declined to speculate on how soon the talks would be completed and the joint venture launched. One analyst predicted the venture's first products could be announced as early as mid-1983, although no one contacted ventured a guess as to where the products would be marketed.

Some industry analysts, however, said the talks are intimately linked to an impending announcement of the IBM Personal Computer in Japan. The model to be introduced, perhaps as early as next month, will be designed specifically for the Japanese market, unlike the version marketed in the U.S., Europe and Australia, one observer said.

"IBM has been interested in finding a Japanese partner for a long time," said Clive Smith, an analyst with the Yankee Group in Boston. Matsushita is a sound choice for IBM, he added, because it is not a direct competitor for most of IBM's products and because it has demonstrated an ability to manufacture low-cost, high-volume electronics products of top quality.

Matsushita also brings a highly developed international marketing network to the bargaining table, Smith pointed out.

Both Smith and Jack Hart, an analyst with International Data Corp. of Framingham, Mass., said IBM Japan Ltd., the company's Far East subsidiary, may not have the manufacturing capacity to supply a potentially fertile Japanese market for the Personal Computer and other low-end computer products.

Focusing on 4300s, 3080s

"IBM Japan will probably continue focusing on the 4300 series and the [3080 series] and leave the smaller stuff to a local manufacturer," Hart said. "Maybe IBM came to the conclusion that the Japanese just do this better than anyone else, including IBM. This is not to say that IBM products made in Japan by Matsushita won't find their way into other markets, like the U.S."

Hart said IBM would profit by having a greater manufacturing presence in Japan, especially with a company as large and well-known as Matsushita.

Citing a distribution pact IBM signed recently with Japanese retail giant Kanematsu-Gosho and the formation in December of a Japanese-IBM computer leasing company, Hart said, "This is starting to sound like a deliberate, overall IBM strategy in Japan."

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In responding, interested parties are asked to specify whether the group is member funded or vendor funded, whether it is staffed by any full-time personnel, how often it meets and if it produces a newsletter of any kind. Respondents should also include their telephone numbers.

Please address all comments and observations about your experiences with user groups to Susan Blakeney, *Computerworld*, Editorial Department, P.O. Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

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Honeywell Expands Large-System Family

(Continued from Page 1)

upgrades, Honeywell claimed.

All three models support a range of concurrent processing activities, including batch processing, remote job entry, on-line data base inquiry and update and interactive end-user languages, applications and services, according to the vendor.

Basic DPS 8M Central System

A basic DPS 8M central system includes a CPU, a system control unit with 8M bytes of memory, and an I/O multiplexer with 36 channel function slots, which can be expanded to 54. Memory on the DPS 8/52M and 8/62M can be expanded to 32M bytes, and the DPS 8/70M can accommodate up to 64M bytes.

Prices for these systems start at $450,000, $725,000 and $950,000, respectively. Additional memory on all three DPS 8M models is available for $25,000 per 1M byte.

Deliveries for the systems are slated for the fourth quarter of this year, according to the vendor.

Entry-Level Systems

The low-end DPS 8 systems introduced by Honeywell to run either in the Gcos 8 or CP-6 operating environments are the DPS 8/47 and 8/49, designed with the same architecture as the existing DPS 8/20 and 8/44 systems, but reportedly utilizing faster circuitry for better performance.

The DPS 8/47, for example, offers approximately 18% more processing power than the DPS 8/44, while the DPS 8/49 reportedly delivers 72% more power than the DPS/44.

These models can be ordered in full-tandem configurations, and the DPS 8/49 can grow to a maximum of four processor configurations, the vendor reported. They are oriented toward distributed processing and communications network management, capable of serving as satellite systems at high-work-load, high-growth locations, according to a spokesman.

The base system includes a CPU, a system control unit and an I/O multiplexer. It is configured with 2M bytes of main memory. All systems can be expanded with additional memory and CPUs, the vendor noted.

The models for the CP-6 environment, the DPS 8/47C and 8/49C, come with 12M bytes and 16M bytes, respectively. The CP-6-based systems also come with a Datanet 8C front-end network processor. The DPS 8/47C costs $228,000 and the 8/49C is priced at $350,000.

Pricing for the Gcos 8-based system is $153,000 for the DPS 8/47 and $235,000 for the DPS 8/49.

Additional memory for all systems costs $10,000 per 1M byte. These systems will reportedly be available at the end of this quarter.

Honeywell also added a power enhancement to the existing DPS 8/44 processor and enhanced its Datanet 8 front-end network processor. Costing $70,000, the processor power enhancement supporting either Gcos-8 and CP-6 can boost performance by 72%, Honeywell claimed.

The Datanet 8 power enhancement increases processing power of a base Datanet 8 by adding a slave processor module and associated cache memory to existing cabinetry. Priced separately, this option is $18,500.

Further details on all products are available from Honeywell, through P.O. Box 8000/T-60, Phoenix, Ariz. 85066.

Proprietary Language Snags Calif. System

(Continued from Page 1)

street because there simply aren't any available. Nobody wants to learn GFS because it doesn't give you a career path."

For the county, therefore, the selection of GFS as CBMIS' main programming language has distinct disadvantages. Why, then, did the local government officials allow their accounting and budgeting system to be written and implemented in GFS in the first place?

"We've been asking ourselves that same question for three years now," Rixman said with a chuckle. "When we first got the system and began using it, AMS told us that GFS' runtimes for specific tasks would be about the same as Cobol's, but we soon discovered that the system was taking us almost 20 hours to run one day's activities.

"In other words, we nearly needed more time to run one day's work than there are hours in a day. We were continually falling behind."

Asked for his reaction to the county's recent CBMIS-related complaints, AMS Vice-President Jan Lodal voiced surprise. "I haven't heard anything from the county for several years," Lodal said. "They haven't called us and told us they have any problems, which I think is informative. If they have serious problems, you'd think they'd let us know."

Lodal expressed little concern that the county is apparently thinking about either rewriting or replacing its three-year-old CBMIS software. "In the normal course of systems development, it would be about time for the county to start designing a new system," he observed.

Another of CBMIS' major purported shortcomings is that the management reports it produces are typically ill formatted, overly complicated and just downright useless, Rixman said. "We receive a voluminous number of reports from the system, but most of them I simply throw away," said Maya Bernardo, a senior analyst with the county's Revenue and Systems Agency. "Only two or three of the reports that cross my desk contain just the right level of detail for someone in a position like mine," Bernardo said.

"Under the system we had previously, I could get a necessary report on my desk on the Monday immediately following the end of an accounting period," Bernardo recalled. "Now I frequently have to wait three weeks before I can receive the same report. That sort of thing drives me insane."

To remedy some of its current computing ills, the county has already rewritten a few CBMIS report generators, but those software tools account for only a "very small portion" of the overall system, Rixman said.

The rest of the system would probably prove extremely difficult if not impossible to rewrite because "our existing programs and editors are quite complex, and we don't have programmers who are familiar enough with GFS to dissect our software and transfer the code to Cobol," Rixman said.

Software Tax Credit Rocky

(Continued from Page 1)

ing previously developed computer software programs, such as the costs of adapting an existing program to specific customer needs or translating an existing program for use with other equipment, do not constitute research or development expenditures."

The consensus among those interviewed on the matter is that the rules are both too exclusive and not specific enough to allow a software developer to know whether a programming project qualifies for the tax credit.

William R. Synnott, senior vice-president of information systems at the First National Bank of Boston, asked his Corporate Finance Department for guidance, but the department "isn't really sure what to make of this. I guess that, in the absence of clearly defined rules, we'll probably make our own judgment and then let them [IRS] challenge it. I had assumed that all new development software qualified for the credit."

Another DP manager said his department "is all tangled up in these rules and regulations." He is "initially inclined to take the credits and then let the government fight it out with us later."

According to Coopers & Lybrand's Yost, fighting it out would mean wading through the tax appeals process and, perhaps, letting the matter be ultimately decided by a judge. But, he added, "the rules as they are now are so vague they don't provide a definite enough standard for either party to make a reasoned determination."

Some software companies represented by the Association of Data Processing Service Organizations, Inc. (Adapso) are reviewing the rules and are preparing to respond to the IRS through Adapso. John Imlay Jr., chairman of Management Science America, Inc. and a member of Adapso, said several software companies have telephoned Adapso to advocate a group response.

"It sounds to me like the IRS has singled out software for some reason," Imlay said. "There's a significant groundswell developing" within Adapso to confront the IRS.

Comments?

WASHINGTON, D.C. — The Internal Revenue Service said it is anxious to receive feedback from users and vendors interested in the rules on the federal investment tax credit pertaining to software development.

Any individual, company or organization wishing either to comment on the IRS' proposed rules or to offer revisions of them should do so in writing. Those wishing to speak at hearings on the matter, which will be held sometime in late March, should submit a brief outline of his oral comments for IRS review.

All inquiries and submissions should be sent to the Internal Revenue Service, Attn. CC:LR:T (LR-236-81), 1111 Constitution Ave, N.W., Washington, D.C. 20224.

Data General Reduces Prices On Eclipse MV/8000 Superminis

WESTBORO, Mass. — Effective immediately, Data General Corp. has cut prices by 7% to 18% on its top-of-the-line 32-bit Eclipse MV/8000 series of superminicomputers.

For example, the DG 9840-B 2M-byte MV/8000 system with a 190M-byte disk, a tape unit, 16 asynchronous communications lines, a system console, DG's AOS/VS operating system and 15 DG software credits now sells for $190,400, down from $222,700, a spokeswoman said.

The Eclipse MV/8000 systems are available with up to 12M bytes of main memory and over 9.6G bytes of on-line storage, DG said. Initial packages include 1M-, 2M- or 3M-byte memory; a magnetic tape unit; a choice of disk subsystems; an 8- or 16-line intelligent asynchronous controller; a system console; credits toward the purchase of DG software; and either AOS/VS for time-sharing, multiple batch and on-line applications or AOS/Real Time 32, for dedicated real-time processing.

Further details on the price cuts can be obtianed from the vendor at 4400 Computer Drive, Westboro, Mass. 01581.

Software Directory Out for IBM Micros

FRAMINGHAM, Mass. — "The IBM Personal Computer Software Directory" has been announced here by International Management Services, Inc.

This publication will reportedly reference all types of software for the IBM Personal Computer and its growing number of software-compatible systems.

The directory is slated for release the second quarter of this year and will be updated on a quarterly basis, according to the publisher.

It will be priced at under $35, the publisher said from Two Frederick St., Framingham, Mass. 01701.

Communications Facilities Update Honeywell's Gcos 8

By Susan Blakeney
CW Staff

PHOENIX — In conjunction with the expansion of its mainframe line (story on Page 1), Honeywell, Inc. updated its Gcos 8 operating system software with a series of communications-oriented multiprogramming and multiprocessing facilities.

Dubbed the SR 2300 product family, the series is compatible with eight of the firm's DPS 8 computers and two of its top-of-the-line DPS 88 very large-scale systems. It is primarily aimed at improving the computer's organizational efficiency, solving program backlog problems and increasing migration support for users of Honeywell's Gcos III operating system software, a spokesman said.

Major features of the SR 2300 software include:

- Personal Data Query (PDQ) end-user facilities.
- Software Disk Cache Buffer.
- Console Manager Facilities.
- Common Files Facility.

The PDQ Relational Access Manager facility allows end users to access production data bases without requiring data extraction from the DP department, the vendor explained. Specifically, Honeywell's Codasyl-compliant Data Management-IV and Integrated Data Store/II structured data bases, as well as its Unified File Access System files, can be accessed by the Relational Access Manager, a spokesman said.

The four products that comprise the PDQ family are the Example Query, the Interactive Query, a Comprehensive Report Examination and Display Option and the Cobol-74 Relational Query. These modules can be leased separately for from $90/mo to $350/mo, the vendor said.

The vendor's Gcos 8 Software Disk Cache Buffer is designed to boost system performance by reducing the number of physical I/O data transfers to and from disk storage. It accomplishes this by setting aside a site-controllable portion of main memory as a cache buffer to store frequently used data, allowing access at main memory speed.

This product is offered at a monthly license fee of $570 on DPS 8/20 through 8/49 systems; $1,045/mo on DPS 8/50 through 8/70 systems; and $2,000/mo for the DPS 88 model.

The Console Manager Facilities allow a "master" console to be given full control over all other consoles on a system, according to the vendor. This master can reportedly manage configuration, security, access and traffic control, with more than 120 commands.

An option for expanded support of remote operator consoles connected via a Datanet 8 front-end network processor utilizes Honeywell's Distributed Systems Architecture protocol. Also, the console journalization option reportedly allows configuration of some system consoles without a hard-copy requirement.

Licensing for the Console Manager is $200/mo, with the remote console option priced at $95/mo; and the console journalization option at $140/mo, the vendor said.

The Common Files Facility reportedly allows up to four systems to share a common file system and operate cooperatively as a cluster. This sharing of mass storage increases total capacity, improves availability and provides load leveling for the Gcos and Gcos 8 operating systems on DPS 8 and DPS 88 large-scale machines, Honeywell said.

This software is incorporated into the Gcos operating system software and is not priced separately, the vendor said.

These software offerings will be available in the fourth quarter of 1983. The vendor can be reached through P.O. Box 8000/T-60, Phoenix, Ariz. 85066.

DPS 8/70, DPS 8/70C Reduced; Cost of Adding CPUs Down

PHOENIX — Honeywell, Inc. has slashed by 25% the price of its DPS 8/70 mainframe, which runs under Gcos and Gcos 8, dropping the system's price from $1.2 million to $900,000. The same model running CP-6, the DPS 8/70C, has been repriced from $1.3 million to $1 million.

The cost of adding a CPU to either of these systems has been reduced by more than 26%, from $892,000 to $655,000, and additional CPUs for the DPS 8/62 and 8/62C are now down to $500,000 from $580,000, according to a Honeywell spokesman.

The cost of upgrading from a DPS 8/52 or 8/52C to a DPS 8/62 or 8/62C has been reduced by one-third, from $240,000 to $160,000. The cost of upgrading the DPS 8/62 or 8/62C to DPS 8/70 models has been cut by more than half, from $511,000 to $220,000.

Honeywell also lowered the price tags on memory modules for the DPS 8/20, 8/20C, 8/44 and 8/44C by 42%. Each additional 1M byte of memory has been reduced from $17,250 to $10,000, the spokesman said.

Memory on the DPS 8/50 through 8/70 models has been reduced from $35,000 to $25,000 per 1M byte.

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Software Maintenance Costs Swell

(Continued from Page 1)

think about," said Girish Parikh, president of Shetal Enterprises in Chicago. "Some are diverting their attention to new technologies, but sooner or later they will have to face the problem. It won't go away."

High maintenance costs are a relatively new phenomenon, and "we in DP still haven't learned to manage the maintenance function," said Larry Singer, author of *The Data Processing Manager's Survival Manual.*

Experts differ on what constitutes excessive maintenance. One estimated that maintenance should consume no more than 40% of the total software budget. Another advised managers to look at costs on a system-by-system basis. When maintenance consumes an additional two-thirds of an operating budget for a single system, it is time to worry, he said.

The syndrome is most pronounced with software that is more than 10 years old. Code written in the early days of DP was often not well documented and subsequent "quick fix" modifications have added to the mess. "How can you recommend that shops systematically upgrade their documentation in an environment that emphasizes speed over detail?" Parikh asked.

The high turnover that bedevils many DP shops has also hastened deterioration. A package modified by several programmers tends to degenerate into patches and poorly documented modifications, which only gets more confusing with age.

"If programs are unstructured, as most are, and changes are made, that causes more problems because programmers are unsure of the structure," Parikh said.

Experts say maintenance is also accorded low status in the programmer pecking order, making it appear a noxious job that programmers try to dispatch as quickly as possible. "The people who do maintenance tend to feel like the black gang in the engine room of a ship," said David Robinson, a vice-president at Index Systems, Inc. in Cambridge, Mass.

Since maintenance smacks of running hard just to stay in the same place, DPers have tended to downplay its cost, even to the point of burying software updates under the heading of enhancements. Authorities who were interviewed, however, agree with Robinson's definition of maintenance as "all the work you have to do to keep the software alive."

While managers have come to accept high maintenance costs as a reality in recent years, many still do not attempt to control costs. "They seem to feel that God has meant them to spend all their time doing maintenance work," Singer said.

Experts Detail Methods To Control Maintenance Costs

As software ages, maintenance costs rise. But there are measures almost any shop can take to help bring costs under control, according to authorities interviewed by *Computerworld*.

The first step is often to improve documentation. "Sometimes programmers are reinventing the wheel" by documenting software long after it has been written, Girish Parikh, president of Shetal Enterprises in Chicago, said. "While a program is being modified, it can be documented at the same time."

Another approach is the "release concept" advocated by Index Systems, Inc. of Cambridge, Mass. The method follows the tack taken by software companies that periodically gather patches and enhancements together and offer them as a new release.

"Hold off until you have a large backlog of fixes and then do them all at once," Index Systems Vice-President David Robinson said.

Parikh advocated the logical construction of programs approach proposed by maintenance expert and author Jean Dominique Warnier and published by Ken Orr and Associates, Inc. of Topeka, Kan. He also supported the functional approach promoted by Edward Yourdon of Yourdon, Inc. of New York.

An essential step is to bring maintenance out of the shadows and grant it a position of respect within the DP shop, Singer said.

Despite all good-faith efforts, some programs are too tangled to be easily maintained, according to Herb Cabral, an account manager for the Information Systems Planning Service at International Data Corp. (IDC) in Framingham, Mass. "In that situation, you're probably better to start off from scratch," he said.

Index Systems Vice-President Gary Gulden noted that using high-level languages as a data base tool and for fixing up old software "provides a degree of flexibility the old data bases don't have." However, Gulden advised businesses to be careful in choosing the right language.

"If you have a high-volume business, you want a language that has strength in data management, with backup and security," he said. "If you're a lower volume business, you want better reporting and data extraction. Most products out there do one or the other well, but not both."

Some consultants pointed to application generators, which write their own documentation, as solutions to some maintenance problems. However, IDC Account Manager Jack Armstrong warned that users should beware of what is still a fledgling technology.

"I've got some questions that quick solutions only really cut down the development time," Armstrong said. "They still generate a lot of code and poor documentation."

Users Fighting To Contain Costs

Yes, there's a problem and yes, we're trying to do something about it.

That was the consensus of opinion of four DP managers recently interviewed by *Computerworld* about the rising costs of software maintenance. Three have undertaken programs to contain maintenance costs over the last three years and the fourth indicated that future software acquisitions will be structured for greater maintainability.

A complete redesign of hardware and software has brought maintenance costs down from 95% of the software budget to 10% in two years at Flexi-Van Corp. in Secaucus, N.J., according to John Shields, vice-president of management information systems (MIS). Shields said the old software was developed in-house and was poorly documented. "We had the whole gamut of problems: rapid turnover, lousy support, poor documentation, you name it."

The company has now gone entirely to packaged applications. "It was purely a business decision," Shields noted. Under the old system, "we couldn't grow in the direction we wanted to grow," he said.

Global Marine, Inc. in Houston began streamlining operations about a year ago and has reduced maintenance from 70% to about 60% of its software budget. Corporate MIS Director Dick Hudson said the department was caught in a routine of making quick fixes and was sometimes having trouble just locating problems in the old software.

The department has "cleaned up some dirty job control language and upgraded the quality of the staff," as well as buying a lot of application packages. Hudson said it is unlikely DP will reduce maintenance percentages any further but noted that the department will continue to evaluate applications carefully before buying.

"There are a lot of users out there who are willing to tell you when something is wrong with their package," he observed.

The DP department at A.B. Dick Co. in Chicago now spends about 50% of its software budget on maintenance, down from 80% three years ago. "We had a labyrinthian system that required lots and lots of documentation and people to work on it," recalled Phil Fellows, director of management systems. "Now, whenever possible, we buy a package. When we develop in-house we try to use the same routines all the way through. We're now running five times as much work with 30 fewer people."

Maintenance costs are "an ongoing concern" at Sperry & Hutchinson Co. in New York, according to Allan Vesley, vice-president of MIS. The costs now constitute about 80% of the software budget.

Vesley said changing user requirements have caused software to be modified continuously for many years. And for each year there are more programs to be maintained. He said the company is not working retroactively on maintenance, "but new applications will be designed in a more open-ended fashion with greater capacity for change."

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Users Waiting for De Facto Standards

Communications Tools Still on Hold: Survey

By Jim Bartimo
CW Staff

Communications products like voice store-and-forward systems and local-area networks may make big splashes at trade shows, but many businesses are still waiting to purchase such products, according to an informal survey of data communications and telecommunications managers.

Only two of the nine managers recently contacted by *Computerworld* had actually implemented a local-area network; two more are planning to buy one eventually.

"Local-area networks are like the 'office of the future.' What's the definition of it?" was the rhetorical question from the New York director of communications services in a company that manufactures personal care products.

De Facto Standards?

Other data and telecommunications managers said they are waiting for a de facto local-area networking standard to emerge, while others maintained no amount of waiting would see such a standard emerge.

"I'm implementing a network right now," reported Richard Bisordi, telecommunications manager for Chesebrough-Ponds, Inc. in Greenwich, Conn. "I'm not waiting for anyone — you have to plan now."

A more recently introduced technology, voice store-and-forward systems, is faring even worse among the respondents. Only two are studying the products and none have yet implemented one.

"We looked at it and had a trial project going with one vendor," said a communications manager of a large Florida-based chain of drug stores.

"The idea is great, but the price has got to come down," he said.

Perhaps the most widely used of the advanced communications technology products is the private branch exchange (PBX).

Nearly all respondents have implemented a PBX and six are planning or investigating the use of the device for the transmission of data as well as voice.

"We hope to enhance our capability for data," the Florida manager said. "We've been promised data rates of 9,600 bit/sec."

Another communications manager is using his PBX "as a dial backup to our data lines and for cost-effective routing. We had a tough time doing this because the telephone company said it was impossible."

Not Yet Implemented

While some vendors portray the PBX as the solution for office automation, local-area networking and building management, none of the data and telecommunications managers surveyed have implemented such advanced applications, although a small percent hope to do so in the next few years.

Another technology yet to come into its own is videoconferencing, according to the poll's results. None of the telecommunications managers interviewed has yet implemented a videoconferencing system, although five of the nine expressed interest in the idea. Price was noted to be the overwhelmingly limiting factor.

"Senior management likes video conferencing," the New York manager said, "but I know they're not willing to pay for it.

"We're keeping our eye on video, but the price has to come down," he continued.

However, two communications managers have implemented audio teleconferencing systems.

"We have audio and graphics," said the manager of an Alabama paper company.

"The driving force behind it is to have people in on discussions that would not have otherwise been in on them. You can't sell it by saying it will reduce travel, because 90% of the people like travel," he said.

While the presence of microcomputers was reported to be steadily rising, only one manager allows the micros to tap directly into the corporate data base and, even then, through hardware instead of the highly touted micro-to-mainframe software that is coming out.

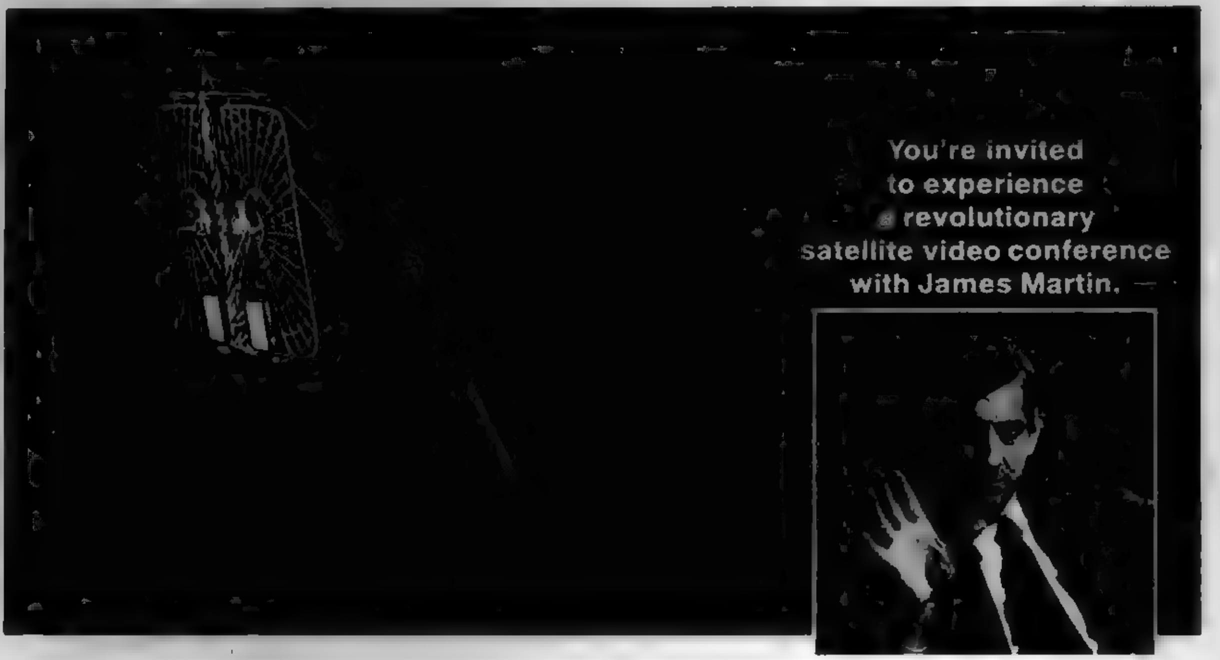
However, respondents expressed interest in this type of communications software and are either testing it or planning to implement it at some point in the future.

Network Explosion

"I see an explosion in networking when you get micro-to-mainframe interfaces," said a communications manager for a San Francisco clothing manufacturer, "but the ones out now aren't very good."

If so few businesses are using state-of-the-art technology, why then is it so talked about?

"A lot of companies go out and get technology for technology's sake without considering the real business issues," the New York manager said. "Then they go and talk about it at conferences, but it usually never gets taken off the shelf."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San Francisco	Hyatt Regency at Embarcadero	12 noon
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First Link Complete in AT&T Fiber-Optic Net

By Bruce Hoard
CW Staff

NEW YORK — AT&T earlier this month began service over a 372-mile leg of what it said will be "the world's largest laser-powered telecommunications system" by sending data, color graphics and video communications between New York and Washington, D.C.

The 372-mile fiber-optic network is the first link in a 776-mile project that by 1984 will connect the Boston, New York, Philadelphia, Washington and Richmond, Va., metropolitian areas.

The result of a combined effort by AT&T's Long Lines Division and six Bell operating companies, it will eventually connect 23 high-capacity, all-electronic switches, a spokesman said.

Overall, the entire system can carry 40,000 to 80,000 simultaneous telephone calls along various sections of the route, according to the Bell spokesman. It transmits light pulses as opposed to electrical signals. Technological improvements are expected to triple its capacity in the near future.

Capacity Figures

A pair of the hair-thin glass fibers can carry 1,300 simultaneous telephone conversations, compared with no more than 24 for the twisted-pair wiring currently used, an AT&T spokesman said.

The full system, running from Mosely, Va., to Cambridge, Mass., is scheduled to be completed next January at a cost of $125 million. It is expected to save $50 million in construction and operating costs by 1990.

AT&T's first commercial light wave system was introduced in Chicago in 1977. Later this month, AT&T and Pacific Telephone Co. will begin operating the first 168 miles of a 633-mile light wave system planned to run almost the entire length of California by 1985, connecting major cities from Sacramento to San Diego.

Five Routes

The company recently announced that it is purchasing 900 miles of optical fiber cable from Western Electric Co. for five new routes. The routes will be announced when the company files its construction plans with the Federal Communications Commission in March.

Last year, Bell Laboratories tested a section of undersea light wave cable 900 miles off the New England coast. The design of that system will reportedly be the basis of AT&T's proposal for a light wave system that would span the Atlantic Ocean by 1988.

One of AT&T's fiercest competitors, MCI Communications Corp., has announced that it will install a New York to Washington fiber-optic system of its own along Amtrak's right of way by the end of 1984.

"Eventually, wideband light wave communications will offer a high-quality, low-cost way to bring a variety of enhanced services — voice, data and video — directly to customers in ofices, shops and homes," said Ian Ross, president of Bell Laboratories.

Datacomm Briefs

Naruc Takes Computer II To U.S. Supreme Court

WASHINGTON, D.C. — The National Association of Regulatory Utility Commissioners (Naruc) has asked the U.S. Supreme Court to decide whether the Federal Communications Commission's (FCC) Second Computer Inquiry Decision usurps states' rights. The association, which represents state regulators, is seeking review of a U.S. Appeals Court decision last November upholding the decision.

One of the appeals court's key conclusions was that the FCC was justified in preempting state authority. Naruc, however, in its brief to the Supreme Court said that "the express terms and legislative history of the Communications Act make it abundantly clear that Congress intended to set a limit on what federal regulatory authority would be permissible with respect to intrastate communications service."

Pacific Telephone To Set Up Separate Sub

SAN FRANCISCO — A separate subsidiary marketing Bell and non-Bell terminal equipment will be established by Pacific Telephone and Telegraph Co. when it is divested from AT&T early next year, Pacific Telephone Chairman Donald E. Guinn announced here recently.

Calling the market for the new subsidiary "very exciting," Guinn said discussions have already begun with prospective suppliers on non-Bell equipment.

Pacific Telephone, one of 22 Bell operating companies scheduled to be separated from AT&T next January, is the first to announce plans to market terminal equipment after divestiture.

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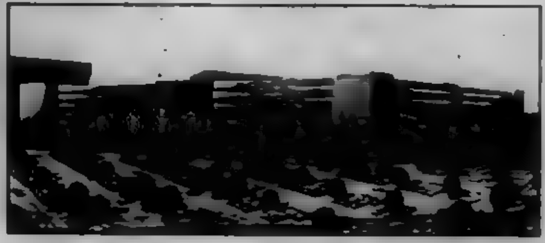

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THE INDUSTRY'S MARKET SUPPORT CENTER

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Bank Set to Open $100 Million Data Center

By Robert Batt
CW West Coast Bureau

BREA, Calif. — Security Pacific National Bank will open a $100 million information processing center here next month that the company believes is a departure from the ordinary organization of computer operations.

The center will become the bank's primary check and statement processing center when it is inaugurated March 15. Security Pacific is reputed to be the second largest check processing organization in the U.S.

With 150,000 square feet of floor space on one level, the center is expected to be a major improvement over the bank's current operations center in Glendale, Calif., which is a multiple-story building with only 20,000 square feet per floor. "The intention in designing this new building was to move the work flow horizontally rather than vertically within a given work space so that work flow is enhanced," explained Carl Beer, vice-president of automated data processing and the person responsible for planning, developing and coordinating the center's construction.

One of the features of the new center will be a bulk file cycle in which data is received, captured, stored, reconciled and verified before being sent to the printer room and statements area. The cycle, which takes 15 hours to complete, has until now been farmed out to the bank's various branches.

According to DuWayne Peterson, Security Pacific executive vice-president of automated data processing, the Brea center will help the bank develop more automated customer services and make them less labor-intensive. "On-line networks and computer processing are critical to our banking effort. Brea gives us a more flexible way of dealing with work flow and allows us to coordinate and centralize activities, thus cutting down on costs," he said.

Designing the center, however, proved no easy task as Security Pacific executives attempted to predict future trends in both banking and new technology. "It's difficult to plan very far into the future in the DP arena because of the fast-changing environment forced upon us either by new technology, competition or legislation," Beer observed. "We found it most difficult to get a solid perspective of what the future would look like technologically at any particular point in time. We were therefore forced to build in more flexibility than we would have if we had a clear picture of where the technology is taking us."

Unlike most DP centers, the computer room is housed in the center of Security Pacific's new building. It contains IBM 3033 and 3083 systems. Peripherals equipment such as printers and sorters are adjacent to the location of a particular application. Service facilities including elevators, telephones, restauraunts and restrooms have been placed on the periphery of the building.

"We wanted to provide as large a floor space as possible free of these service functions," Beer explained. "In many data centers, such facilities are often in the center of the building, where they inhibit the installation of new computers and work flow designs."

The Brea center will not replace the Glendale operation. Instead, the bank intends to split its work load between the two centers, with each acting as a contingency center to the other in the event of a breakdown.

"This system has been faultless. We anticipated problems; we didn't have them."

Alan Lewis, *Systems Manager, Thom McAn*

Increasingly, companies who consider *any* downtime unacceptable have been turning to Stratus, a company with a reputation for high reliability that lives up to its billing. Comments by early Stratus customers indicate that Stratus has delivered on its promise of a hardware solution to fault tolerant processing. These companies were surprised by other Stratus qualities they hadn't expected, and an operating system called "... light years ahead of others we've had to work with," by a major Wall Street brokerage firm.

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"I'm incredibly impressed with the quality and maturity of Stratus's software and hardware."

Michael Feldman, *Vice President, Technology Consulting Corp.*

"Anybody can learn the Stratus editor in a few minutes. I find our programmers are dealing with the applications, not fighting the computer environment."

Tony Peraino, *Software Contractor, Macomb Multiple Listing Service*

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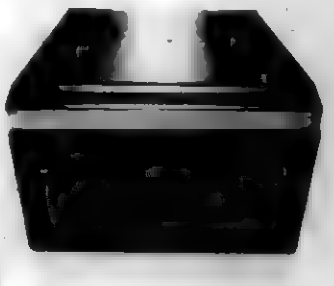

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Study Cites Need For CIS Faculty

STILLWATER, Okla. — Qualified faculty in the computer information systems (CIS) area are in high demand, according to a recent study conducted here by Oklahoma State University. The demand for qualified CIS personnel will continue into the future, it added.

The survey focused on business CIS programs in schools accredited by the American Assembly of Collegiate Schools of Business and located throughout the country. The study's research team was headed by Dr. Jeretta A. Auglar of Oklahoma State.

Participants in the survey indicated that employment of full-time faculty in the CIS area ranged from one to 30 people, while the majority admitted to CIS staffs numbering between one and six full-time people.

Utilization of part-time personnel appears to be prevalent in CIS groups, with many institutions employing up to 24 part-timers to service their increasing enrollments in virtually all areas of CIS, the survey said.

In addition, over 60% of the participating colleges and universities have reportedly hired additional faculty in the CIS area within the last two years, according to the survey.

Indicative of the high demand for CIS faculty, 70% of the respondents noted that they currently have one or more openings in this area. In fact, 50% of those surveyed anticipate more hiring over the next two years, the study said.

The survey can be obtained from Oklahoma State University's College of Business Administration in Stillwater, Okla. 74078.

User Not Sorry It Served As Test Site for TP Monitor

By Paul Gillin
CW Staff

BALTIMORE — AAI Corp. is not accustomed to being a first user, especially of a product as critical as a data communications monitor. But time was getting short when the company decided to shift from Mathematica Products Group, Inc.'s (MPG) Swift II teleprocessing monitor to MPG's Atlas monitor late last year.

"When our transaction rate started climbing over 30,000 a day, [Swift II] began bottlenecking badly," recalled Al Schunk, senior systems programmer. "We needed some sort of a multitasking monitor, and we had well over 100 on-line application programs to consider.

"We're generally leery about being a beta test site," Schunk admitted, "but our teleprocessing environment was so badly degraded that we were willing to take a risk for a quick performance improvement."

For that reason AAI accepted MPG's offer to become a test site for Atlas. Designed to compete with CICS [CW, Jan. 17], Atlas promised compatibility with Swift II and an interface to the Cullinet Software, Inc. Integrated Data Base Management System (IDMS) that AAI uses.

"Having some familiarity with the efficiency of Swift, we figured that Atlas was pretty good, too," Schunk said. "It has tested well and we haven't had to convert any of our programs."

Remote Terminals

AAI, a mechanical systems development and production contractor for the U.S. Department of Defense, relies on data communications for most of its processing. All but 10 of the company's 150 on-line terminals are remote, "and requirements from users are for very heavy processing on-line," said Dave Powell, manager of data systems.

Typical on-line applications for the $152 million company include inventory and manufacturing control, bill of materials processing, procurement information and information retrieval on almost every application. The company's two IBM 4341 Group 2 computers running under DOS/VSE and VM/CMS handle about 40,000 transactions daily.

When it originally selected a teleprocessing monitor, AAI's Data Systems Department considered CICS. "We decided CICS would be more difficult to use and maintain," Powell said. "We would have had to hire another systems programmer just for CICS."

"Atlas runs at least as well," Schunk added. "Also, the installation was a piece of cake. MPG issues a tape that is used to propagate DOS relocatable and source libraries. The tape also contains the JCL stream that's used to link-edit and assemble various modules and books to create the executable code. It's very simple and straightforward."

AAI installed Atlas and shut down Swift II the same day. Execution has been virtually flawless since then, Schunk said, except for a "thrashing" problem when the monitor was first brought up.

"We didn't expect the paging rate to be as fast as it was, and we only had 1M byte of memory at first," he said. "Thrashing happens when the system spends more time swapping pages in and out of virtual memory than doing any real work. But we added another megabyte of memory and the problem straightened itself out."

Performance improvements were evident almost immediately, according to Powell. "Average response time across the entire system dropped from seven or eight seconds to three or four seconds."

'Atlas' Proves Useful For High-Volume Processing

BALTIMORE — Several features of Mathematica Products Group's Atlas data communications monitor make the package useful in a high-volume processing environment, according to Al Schunk, senior systems programmer for AAI Corp.

"A lot of our older programs are longer than they should be in terms of the memory required to execute," Schunk said. "These programs do an awful lot of I/O. Atlas has functions in which a program can transfer control to itself or to another program. That enables other programs to get on the system that might not otherwise have a shot," Schunk commented.

Schunk said his firm has also made extensive use of a co-resident program support function provided on Atlas. "Basically it gives us the option to choose up to 20 task areas through control card options," he said. "Some of those areas can be dedicated to a specific task or tasks. If you have 10 programs that are used heavily and you've declared 20 task areas, it's likely those 10 will remain in the task area. The Atlas logic checks to see if a program is loaded before loading it again, and that cuts down quite a bit on extraneous overhead.

"That's not unusual in a teleprocessing monitor," he continued, "but Atlas does it better than any I've seen."

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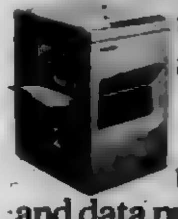
The first is as a letter-quality printer. The second is as a speed printer.



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Service to Predict Congress' Votes via Data Base

By Paul Gillin
CW Staff

BURLINGTON, Vt. — Congressional observers and lobbyists may soon find themselves turning in an unlikely direction — toward Burlington, Vt. — to determine which way the political winds will blow on Capitol Hill. Or at least that is the hope of a political scientist and developer of a specialized software package here.

Beginning this summer, a new service will be added to the Computer-Assisted Legislative Liaison; On-Line Political Evaluation (Calliope) system developed by University of Vermont Prof. Garrison Nelson. The service will forecast congressional votes on key issues using a data base of more than 3 million pieces of information spanning Congress' last 30 years. It will be accessible via an on-line service offered by Polimetric Associates, the management company for Calliope.

Nelson's computerized crystal ball actually focuses on the 15 or 20 members of Congress most knowledgeable on each issue, those to whom other legislators turn for information. The forecasts, he claimed, will be most useful to lobbyists and to members of the news media who want to speculate on the outcome of specific votes.

"The system allows people with business in Washington to get baseline numbers they can use to forecast a vote," Nelson said. "It gives a really quick description of where they have to do work. It can help a smart lobbyist work better."

Newest Offering

Forecasting is the newest offering on the Calliope service, but probably not the most useful for private industry. Since its inception two years ago, Calliope's bread and butter has been a standard report system that takes all votes in Congress and breaks them down by party, region, seniority, liberalism, conservatism, business and labor orientation and presidential support.

The on-line report can be accessed by bill name, number, issue area, date of floor action and other characteristics. A client can receive a three-page report on any bill in about five minutes, Nelson claimed. The information is generally available within 24 hours of the vote.

Calliope also offers a specified search system that pulls out a range of political and demographic information on legislators specified by the client. The data can be used to identify factors that influence the ways in which members vote.

A customized report feature allows clients to generate reports based upon their own specifications, such as contributions to political action committees or the volume of the client's business in a specific district. "The corporation may discover an alliance it can strike up with a trade association or another corporation which would broaden its influence within the Congress," Nelson said.

Specialty Programming

Calliope also offers specialty programming in which, for example, a chart of congressional characteristics can be merged with a client's mailing list. Such data can be used to lobby members in a certain geographic area.

The Calliope service combines a data base management system with an analytical package written by Nelson. Members of Congress are listed with more than 60 political and demographic variables, plus committee assignments and voting records.

Service bureaus currently offering Calliope include Interactive Computing of Vermont, South Burlington, Vt., and Dialcom, Inc. of Silver Spring, Md. Nelson said the services will also be available from American Management Systems, Inc.

The method is the culmination of 15 years of teaching and research experience for Nelson, who holds a Ph.D. in political science from the University of Iowa. Nelson has specialized in quantitative applications in political science for 12 years and has been a staff member for Sen. Patrick Leahy (D-Vt.).

Despite the apparent breadth of Calliope services, Nelson said the company has only four current customers. One user at the *National Journal*, published by Government Research Corp. in Washington, D.C., said the company's lack of marketing focus has kept the service obscure.

"Nelson has made an extremely valuable information process which, if people would learn more about it, would be tremendously helpful for research on Congress," Jennifer Detoro, director of information systems for the *National Journal*, said. "On election day, for instance, we used it to identify losers in the [House of Representatives], their votes on some major bills and their ratings by major rating bodies. Then we compared them with the House as a whole."

Nelson said the standard report and specified services cost $150/mo for a minimum one hour of connect time with a $112/hour charge for up to five hours of service and $100/hour thereafter. An extended time contract for more than 100 hours of connect time costs $5,000/year.

Polimetrics Associates is located at 176 Battery St., Burlington, Vt. 05401 and at 2950 University Terrace N.W., Washington, D.C. 20016.

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An Interview With a Computer Pioneer

How do your machines — the first electric digital computer and the ones you built during the war — differ from today's machines?

They were all binary . . . but the elements that were used to get binary operation in the early computers were the telephone relays. Following that, of course, the vacuum tube took over and after that the transistor and after that the integrated circuit, and I don't know what will be next. But the basic logic is pretty much the same, it has been ever since the third of the relay computers. Speeds have gone up by at least 1,000:1, and the size and costs have come down at least 1,000:1 in the intervening years.

You mean it cost more to build a computer then than it does now?

Oh, much, yes. For instance, I have one of these little pocket calculators, which can do a few things — multiply, divide and add — and I think they are running about $7 to $8. The first one [computer] that did the complex multiplication and divisions was $20,000. So that's come down at least 1,000:1.

The first machine I built was about 8-feet high, 6- to 7-feet across and maybe a foot thick, as it was on telephone relay racks. This one today, as you can see, is no more than a hundredth of the volume of that.

It took about 30 seconds to do a complex multiplication, which involved four ordinary multiplications of real numbers. At present, you can get a multiplication of real numbers in well under 30 microseconds. So the speeds have gone up more than 1,000:1.

Does the process of developing computers take longer today because the machines are more complex than they were 30 years ago?

Computer design hasn't changed too much. It took us nine to 10 months to design and build the digital binary computer — the complex No. 1 — and the big one that went to Aberdeen University probably took about

(Continued on Page 16)

George R. Stibitz

Dr. George R. Stibitz, credited with the invention of the first electric digital computer, was inducted into the U.S. Patent and Trademark Office's National Inventors Hall of Fame in Arlington, Va., during National Inventors Day ceremonies earlier this month. An exhibit describing the evolution of Stibitz's first computer is on display at the hall.

The recipient of 34 patents for inventions ranging from computer systems to a stereophonic organ, Stibitz was interviewed recently by Computerworld *staff writer Patricia Keefe.*

Stibitz began as a research mathematician at Bell Laboratories, where he developed the first electric digital computer. Work on the project began in 1937, when Stibitz took home some spare relays and created a binary adder that proved binary numbers could be added with relays.

Stibitz then worked with Samuel Williams, a switching engineer at Bell Labs, to apply the basic theory of the binary adder to the design of what he called a Complex Number Calculator.

The system took about 10 months to develop, occupied an entire closet and could divide two eight-place numbers in 30 seconds. It was publicly demonstrated for the first time in 1940 using a teletypewriter in Hanover, N.H., which was connected to the calculator at Bell headquarters in New York via telephone lines — possibly the first demonstration of a remote data link.

While extraordinary for its time, the first relay computer was limited to the four basic arithmetic functions.

During World War II, Bell Labs loaned Stibitz to the National Defense Research Council. Stibitz and Bell engineer Ernest Andrews designed four more computers between 1942 and 1945, for the control of antiaircraft guns and missiles. These included the first programmable computer and incorporated such innovations as automatic round-off and the floating decimal point.

Stibitz left Bell after the war to work as an independent consultant. Since 1964, he has been affiliated with Dartmouth Medical School both as a researcher and physiology professor.

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An Interview With a Computer Pioneer

(Continued from Page 15)

a year. You can't get much of a computer nowadays designed from scratch in less than a year. I'm not talking about production, of course, just the design.

As a professor in the Physiology Department at Dartmouth Medical School, you have been using computers and mathematics to study biomedical problems. How are computers used in these studies?

We use a New England Digital minicomputer, which we've found very useful for the work that we're doing here because we can set it going and it doesn't cost us much to run. It's also useful in the laboratory. It's set up with a pretty good interface with the physical world so that you can use it to measure, for example, the response of a cell membrane to an electrical impulse applied to it, analyze the data and so on.

One of the problems I worked with for a while had to do with the respiration of the cat. The computer receives signals, analog-to-digital conversion from such things as oxygen temperature, the rate of respiration and a number of things of that sort which a computer saves on floppy disks and later performs detailed analysis.

Some analysis goes on during the experiment so that by the time the experiment has ended, or even before then, the experimenter has a chance to see what's happening through the variables. If something is wrong, he can stop the experiment and start over again. The experiment may last half a day so that it's quite important to be able to detect any trouble that's occurring before you've spent a lot of time on it.

We also have access to the Dartmouth College computing center by telephone connections — that's primarily a Honeywell [Inc.] one . . . It works through a time-sharing system. It runs, overloads when you have more than about 180 to 200 users. Very often that happens so that frequently, it is more convenient to have a minicomputer, or even a micro, than it is to use the time-share system.

I use an [Apple Computer, Inc.] Apple at home. Many times the Apple does things that the time-share system can't do.

How does the sophistication of today's computers aid research and development efforts in comparison with systems 10 and 20 years ago?

The equipment of today is far more elaborate and sophisticated. A researcher can set up a model, tell the computer what it wants to do and feed it situations.

Minis and micros have helped researchers a lot, they can do things small computers couldn't do, even 10 years ago. Research is faster you could say, I suppose — more exact in a sense that you can set up pretty elaborate equations and take more variables into account. You can come a whole lot closer to expressing the real system of a model today.

Where can we expect to see growth in technology in the future?

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NEW YORK — The 1983 edition of the "Catalog of American National Standards" has been released here by the American National Standards Institute, Inc. (Ansi).

The 192-page text lists about 10,000 current Ansi-approved standards on dimensions, ratings, terminology, symbols, test methods, performance and safety requirements for a wide range of materials, including those used in the production and maintenance of information systems.

The cross-referenced catalog is available for $10, and subsequent supplements are free, the publishers said from 1430 Broadway, New York, N.Y. 10018.

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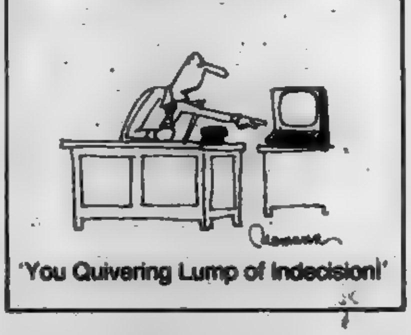

'You Quivering Lump of Indecision!'

Micros Seen Receiving Mixed MIS Reception

By Bob Johnson
CW New York Bureau

NEW YORK — Are personal computers and professional workstations being greeted with open arms by large companies' management information systems (MIS) organizations, or is user interest force-feeding them into corporate information systems?

It's a toss-up, a recent *Computerworld* survey of personal computer users and MIS managers in the New York metropolitan area found. Although some corporate users of personal computers complained of a lack of support from the MIS group, an almost equal number of MIS respondents reported that there is indeed support and in some instances a real effort to integrate personal computers into large corporations.

Bob Petrie, an assistant vice-president of Manufacturers Hanover Trust Co.'s Wholesale Management Information Services Group, said his company's MIS group did not give him any encouragement when he began using a Heath Co. 89 microcomputer on his own about 1½ years ago. The only notice or approval of it came from his department head.

"We've loaded the Heath up with software packages for terminal access and data base access ourselves. As a matter of fact, we give the MIS Department demonstrations showing them how we use it. It's almost a matter of reverse education here," he said.

The large systems people have acquired a "handful" of IBM Personal Computers for the bank, Petrie said, but they never told users how the micros work. At the same, he admitted, they are not necessarily "hostile" about end users having their own micros.

A section of the MIS organization concerned with office automation has received a corporate mandate to spearhead personal computer integration. "This office automation group is responsible for getting experience on personal computers, setting policy and teaching end users how they work. It is this group that is promoting their use, not the MIS area," Petrie stated.

When asked why the MIS area has not shown more interest in personal computers than an office automation group, Petrie explained that the OA people have the end user's interest at heart while MIS is so immersed in the daily running of the mainframe shop that it does not have the time to work on micro integration.

Another user, who asked not to be identified, said an IBM Personal Computer was introduced into his investment management group against the advice of the systems department. "We have gotten absolutely zero support from the MIS Department," he said. "It took us two years [one year in learning introductory aspects] to come up with the software for the [Personal Computer], which the MIS people wanted to do on their [IBM] 370 mainframe. But now we do

(Continued on Page 18)

Group Formed for Micro Managers

NEW YORK — A new association has been formed here to champion the cause of a new breed of computer professional.

The Microcomputer Managers Association (MMA) was established about seven months ago to "coordinate the ideas and principles of the management of microcomputers in the organizational structure," according to its president and founder, Alan Gross of International Paper Co. The MMA membership includes nearly 40 people known by a variety of titles — "microcomputer manager," "personal computer liaison" and "small systems specialist," for example, — from such companies as Bankers Trust Co., Chase Manhattan Bank NA and New York Telephone Co.

Whatever their titles — Gross himself is known as microcomputer product consultant — MMA's members are the people within their respective companies whose responsibilities include buying and installing microcomputers and training users to use them. Thirty percent to 40% of the large companies in the U.S. have at least one microcomputer manager, according to the organization.

The MMA is not a typical users' group, according to Gross. Instead, "we are generally made up of the people who take care of controlling microcomputer use or end-user computing where time-sharing is included. Our members' duties usually include the integration of microcomputers into the management structure so things don't become helter-skelter.

"We are attempting to give the microcomputer manager a forum where topical subjects about this kind of microcomputer management can be aired. We want to allow managers to share information in this field," he said.

More information on the MMA can be obtained from Gross at International Paper Co., Room 36-3, 77 W. 45th St., New York, N.Y. 10036.

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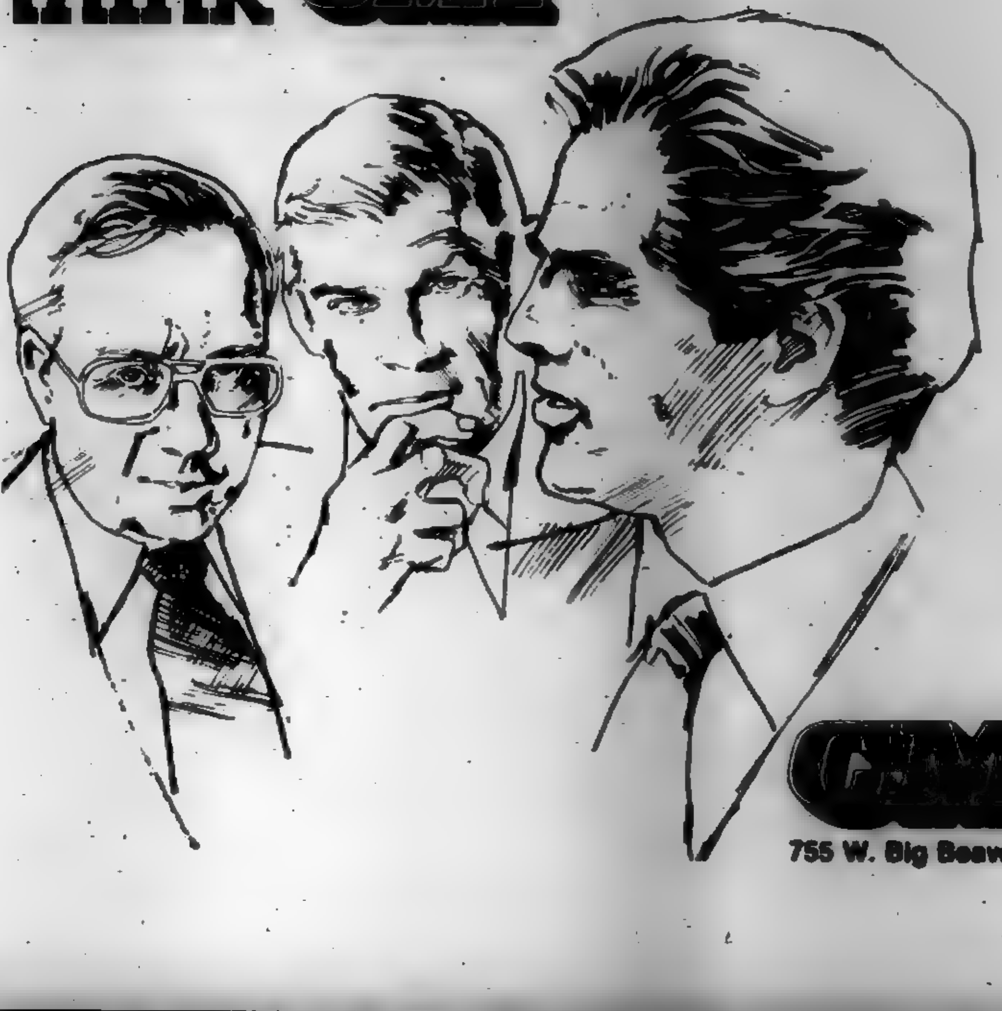

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Study Finds Mixed Micro Support From MIS

(Continued from Page 17)

what they wanted to do on the big machine, and they [MIS] hope it falls flat on its face."

The lack of support from MIS did not surprise the user, who said he felt MIS made a decision not to push for microintegration. "We wanted an IBM [Personal Computer], some other department wanted a [Commodore Business Machines, Inc.] micro and so on. The MIS Department has not come up with a conclusive standardization policy," he said.

But not all MIS departments are unconcerned about personal computers. An ambitious effort to integrate microcomputers is occurring at Columbia Pictures Industries, Inc. in New York.

"We decided that microcomputers would be important to help lighten the MIS Department's load," recalled Margaret Levine, manager of microcomputers at Columbia. "Our purpose is not to get a microcomputer on everyone's desk, but to have users use software packages for their work without having a programmer set them up."

Spreadsheet Trading

Being the MIS person responsible for standardization of personal computer hardware and software, Levine has observed that Columbia's MIS coordination is allowing users to trade spreadsheets and send diskettes to each other to help in their work.

Centralized support from the MIS area is an essential part of making data secure, an issue of concern whenever micro integration is discussed, Levine said. "We educate users about the backup of data; we try to show them how to back up their own files. This will also help MIS in the long run as local-area networks grow. As data becomes more centralized, information from the microcomputers will be easier for the MIS department to back up on the mainframe."

Users also feel more secure using a microcomputer for sensitive data. "Many users are uncomfortable about putting their work up on a mainframe where almost anyone can access it," Levine pointed out. "Someone who has disks locked up in his desk has a pretty secure system."

Positive MIS involvement with microcomputers is also happening at International Paper Co. here, according to Allen Gross, the company's microcomputer product consultant. The company has set up a center at which several vendors' hardware is displayed; the center also offers consulting services and microcomputer training classes.

"Although we are not strong advocates of personal computer use, we realize that they will be used and there is a need for good support. Through our information center we offer whatever services we can provide for users," Gross said.

Micro Fears Seen Haunting MIS Groups

NEW YORK — Lack of standardization, the use of many different vendors' products, inconsistent input and output and security breaches are some of the fears about personal computers that haunt management information systems (MIS) departments.

Adding to those fears is the fact that because of micros' easy availability and low cost, users who meet resistance from their corporate MIS groups can buy their own computers. That means "some kind of coordination as to operating systems and networking standards must be set to prevent problems later on," observed Susan Perricone, president of the Systems Advantage Ltd. consulting company here.

Perricone offered two different examples of corporate attitudes on users buying their own personal computers: "I have been trying to sell a small system to a major pharmaceutical company for quite a while now, and the department cannot buy it until MIS gives the OK. On the other hand, someone from a large bank bought dozens of IBM Personal Computers and he is now worrying about how he is going to tie them all together."

John Gosden, vice-president and technology officer at the Equitable Life Assurance Society in New York, takes a different approach to satisfying users' microcomputer needs. A Personal Computer Advisory Service (Pcas) has been set up within the company to advise users and to standardize the purchase of personal computers.

"We foresaw the problem of microcomputer proliferation and confusion and thus formed Pcas from the Technical Services Department about a year and a half ago. Users who want to purchase personal computers can by and large get the support they need. They can even use a handbook that we have published on the subject of picking a microcomputer," he stated.

Users can get "automatic approval" for purchasing a personal computer without MIS interference if Pcas condones the purchase.

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There is a sense of anger among much of high-level management because DP, although expensive, is not giving them what they want, is inflexible, and makes the introduction of new procedures difficult. James Martin

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Japan's Public Schools Seen Remiss in Computer Field

By Susan Blakeney
CW Staff

TOKYO — Say "Japan" and images of a superefficient, computerized, highly automated micronation immediately spring to mind.

However, these images do have one apparent flaw. While Japanese industries apparently have a firm grasp and knowledge of computer technology, the country's public school system is apparently remiss in this department.

For example, only .03% of Tokyo's public schools currently have computers in their classrooms, according to recent reports. This dearth of computer education is leaving Japan's computer industry with the responsibility for either training its work force from scratch or recruiting people from technical and vocational schools — an educational path often frowned upon.

"You really have to go to a private school in Japan for computer education," admitted Nazuna Comfort of the Education Department at the Japanese embassy in Washington, D.C.

On a recent visit to Japan, Dr. Lloyd C. Neilson, superintendent of schools in Roseville, Minn., and president of the American Association of School Administration, was surprised at the discrepancy between the Japanese high-tech industry and its lack of computers in the classroom. Neilson reported that the one public school he found in Japan that used computers had "primitive" equipment that looked more like calculators than computers, and programming courses were virtually nonexistent.

"There is one system of learning in Japan," Neilson explained. "The school system focuses on cognitive learning, whereas our goals are broader. We try to teach students how to interpret and apply information — they don't."

He added that computers are being widely used in his Minnesota school district as well as in public education systems throughout the U.S.

While Japan's public schools systems are reportedly behind those in the U.S., there is definitely no lack of interest in computer education in that country, Neilson observed. "All the educators I spoke with were interested in broadening their curriculum like our schools."

Neilson placed part of the blame for Japan's poor high-tech educational system on the Ministry of Education there. While the ministry is responsible for the island nation's public school system and should see that students are adequately groomed and prepared, it is notoriously slow to respond to change.

Jerry Wasserman, manager of strategy-formulation practices for the information industry at Arthur D. Little, Inc. in Cambridge, Mass., and a frequent visitor to Japan, offered another reason for the Japanese deficiencies in computer science training. He claimed there are no computers in Japanese public schools because the Japanese language does not easily lend itself to the computer.

"It's a cultural difference," Wasserman said. "If young children were to use a keyboard, it would have to be in Japanese. The problem is there are 2,500 different symbols in the language. Kids have to learn English first," he argued.

While English is taught as the primary second language in Japanese schools, its use for computer education does not necessarily follow, Wasserman explained. "We'll keep ahead of Japan in this area because it's our language that's universal."

The U.S. industry must also "start from scratch" in making its recent college graduates computer functional, he pointed out. "Japan's no different from here in that respect."

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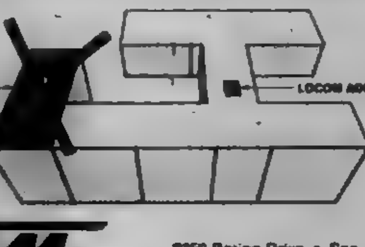

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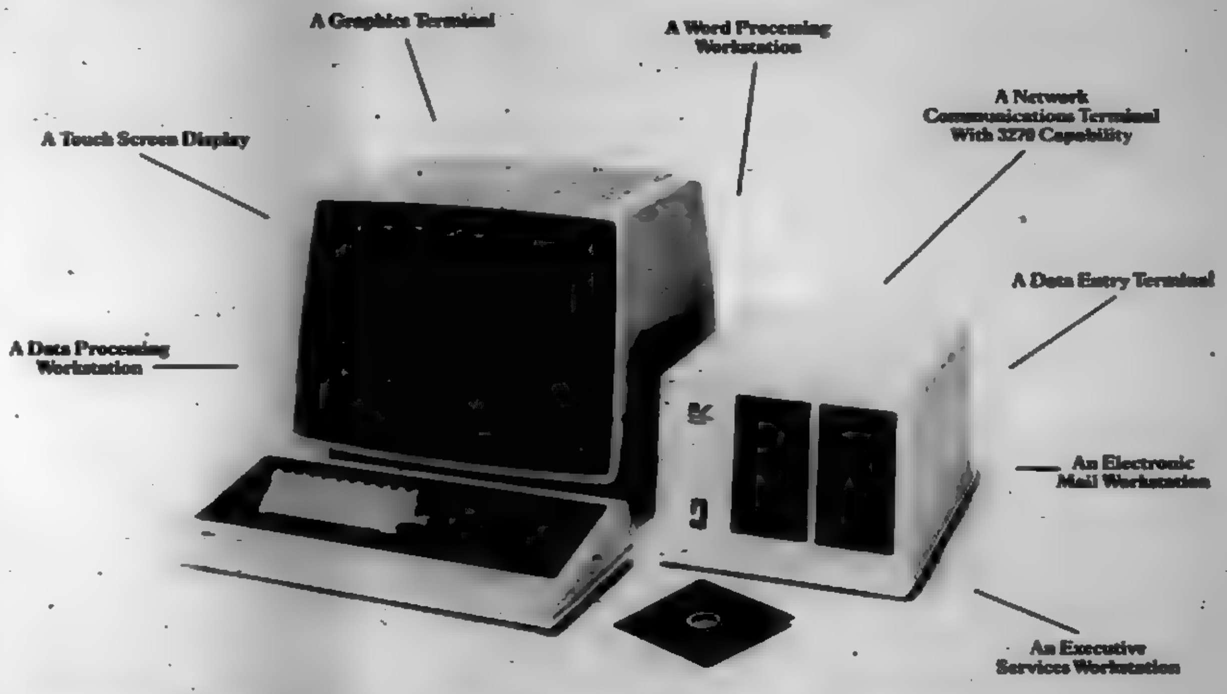
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Insci Head Committed To Personnel

By Bob Johnson
CW New York Bureau

NEW YORK — Supported by $4.5 million in recent funding, the chairman and chief executive officer of Information Science, Inc. (Insci) is committing his firm to the integration of human resource applications with data bases, an area he claimed has lacked proper attention.

Companies usually assign more bottom-line-oriented applications a higher priority than human resources — an unfortunate situation because 50% to 75% of a company's costs are people costs, Insci's Leo Kornfeld pointed out. "Personnel, payroll, pension administration, health and safety — these are all areas that have been traditionally looked at as being needed but not all that important. The DP side of companies has been especially guilty of downplaying the importance and integration of these applications, probably because of its image and the lack of comprehensive software," Kornfeld said.

But this will change with the integration of human resource applications with data bases. "Data bases provide the opportunity to make applications products more usable. This is very important in the field of human resources because it gives employees and human resource personnel true on-line interactivity," Kornfeld maintained.

Kornfeld described data base technology as a "boon" to the human resources area and advised DP managers to get more involved with the development of these applications. "This area will become increasingly more important to companies overall. DP executives should push the human resource cause. These fields of personnel, payroll and so on are becoming increasingly more complicated and they require effective information processing. When chief executive officers need information about manpower costs for budgeting reasons, for example, a comprehensive data base will shine."

The Insci president predicted that employees will soon be able to sit down at a terminal with a nontechnical human-resource specialist and access all pertinent information about the employee and the company's people information. "Companies will now be able to satisfy almost all of their employees' questions about pension plans, benefits and so on," Kornfeld noted.

First User of T/S Payroll/Personnel

By Paul Gillin
CW Staff

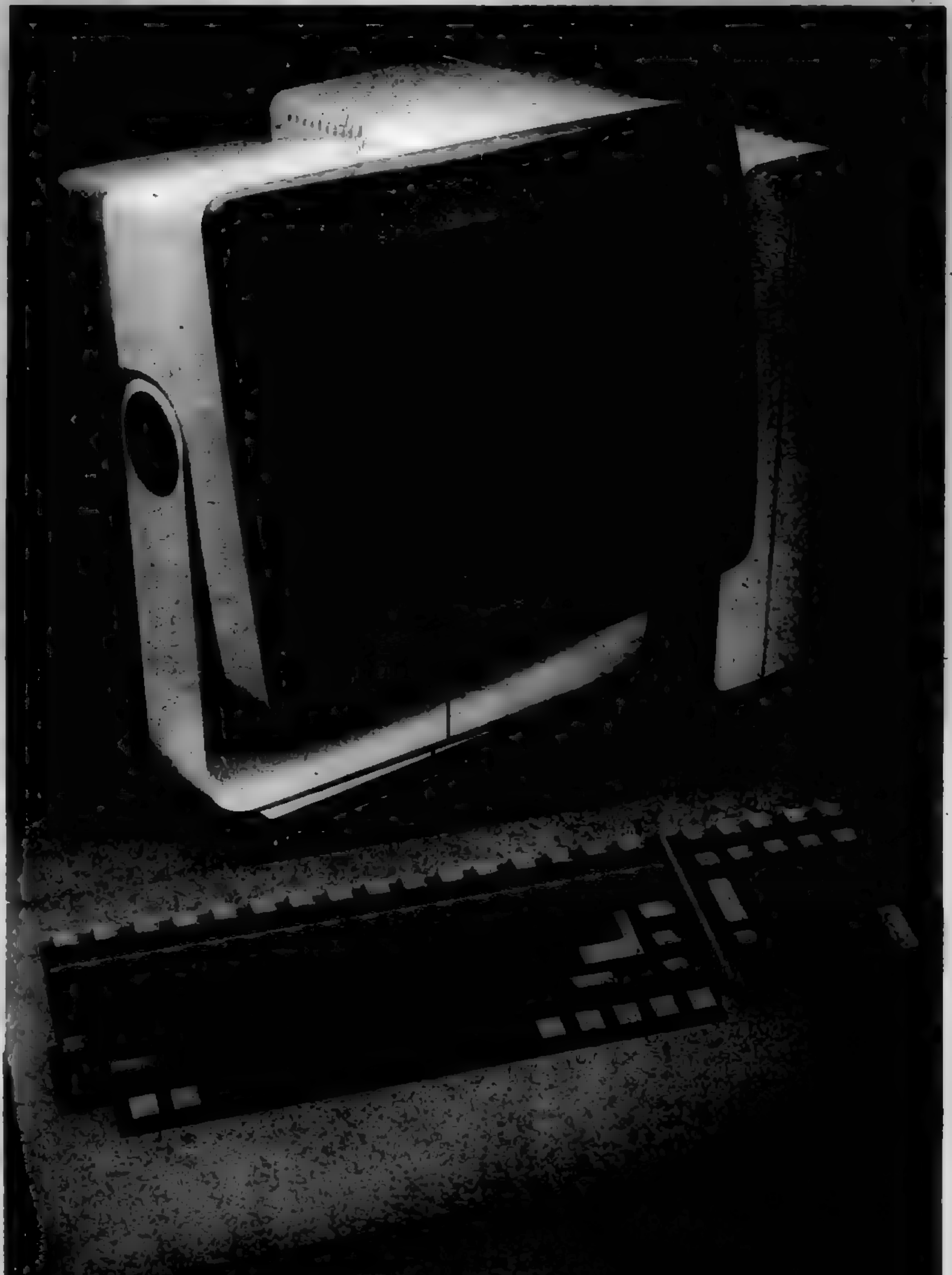
BALTIMORE — Payroll and personnel are two applications that growing companies often move in-house when time and money allow. But the Provident Savings Bank here recently bucked the trend by moving those applications off an in-house computer and becoming the first user of a payroll/personnel service provided by a time-sharing bureau.

The outcome, according to a bank official, has been significant cost savings as well as improved efficiency in the bank's personnel operations.

The decision to use the service was made in large part because of the bank's size, according to Richard Isacoff, its vice-president and director of human resources. The bank's payroll package, which was "basically writing checks," needed to be upgraded, but "with 600 employees, it just didn't pay to buy, install and maintain an in-house system. It would have cost $40,000 to $50,000 to buy the right package, and the maintenance is about the same as running a time-sharing system.

"On top of that," he observed, "there are special security issues when you go in-house. With a salary budget of $8 million, we wanted to make sure we were spending it in the right place. You don't monkey around with people's paychecks."

Before joining Provident Savings, Isacoff worked for a bank that sold payroll services. He had evaluated a variety of personnel services available via time-sharing — including offerings from Information Science, Inc. (Insci), Comshare, Inc. and



Service Cites Cost Savings, Personnel Efficiency

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He had also evaluated software packages from National CSS, Inc. and Genesys Software Systems, Inc. Insci's personnel administration system offered "the best price, the most flexibility and the least 'user-unfriendliness,' " Isacoff said.

When Isacoff heard that Insci was adding an integrated payroll function to its time-shared service, Provident Savings signed on as a first user.

Alters Record Keeping

Provident converted to the Insci service earlier this month. In addition to the $40,000 one-time cost savings, the service has enabled the bank to alter dramatically its record-keeping structure.

"We had been using DP for payroll to do faster what we've always done by hand," Isacoff said. "Now we're learning how to do it better. The computer is changing the way we do business."

The service integrates the payroll and personnel data bases so that only one entry is required to add or update an employee's records. Each employee fills out a data collection form and the information from it is input info the data base by the human resources department.

"The basic human resource system includes just about all the employee data we would want, from address to compensation to performance evaluation," Isacoff said. "We use the basic personnel record to create a basic salary file and we only need to update one file. That eliminates the need for edit runs."

The system tracks staff movement throughout the organization and adjusts departmental budgets accordingly, "so we're comparing apples and apples," Isacoff said. Additionally, it provides quarterly tax reports automatically — "nothing unique, but something we used to do manually."

Because payroll and personnel are integrated, the vice-president said, the service is self-auditing. "It's very easy to make sure you only have one payroll and one personnel file," he said. "It's much more difficult to create a false payroll file this way, although it's always possible."

Security is multilevel, based on the need to know certain information, he added. "Certain functions are restricted to certain people and only three employees have the ability to update files," he said.

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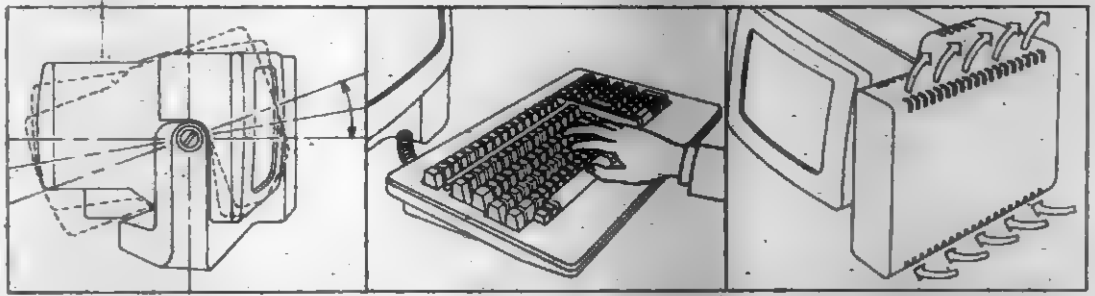

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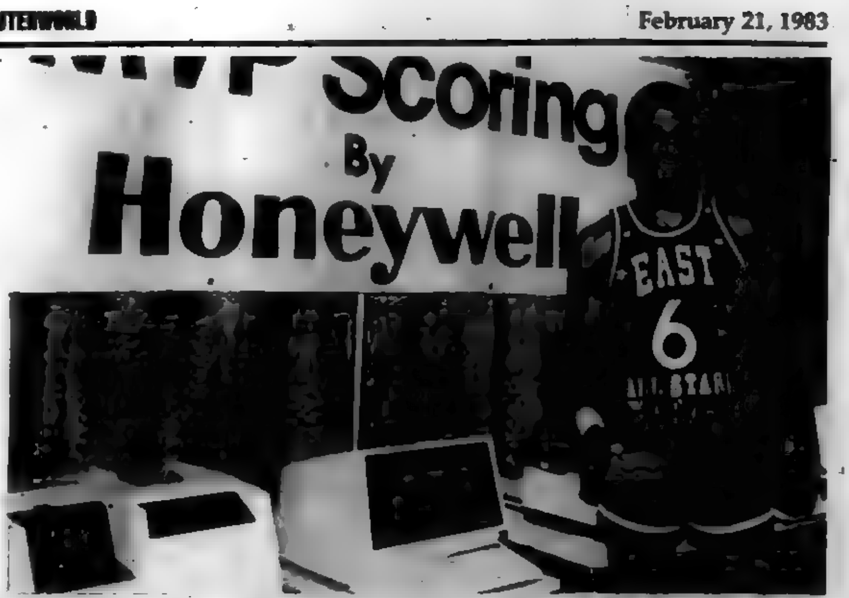

Julius Erving of the Philadelphia 76ers pauses near the Honeywell, Inc. DPS 6/32 computer that just minutes before had named 'Dr. J' Most Valuable Player of the 1983 NBA All-Star Game. The game was played Feb. 13 at the Forum in Los Angeles [CW, Feb 7].

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IDC to Host Spring Sessions On Micros in DP

FRAMINGHAM, Mass. — "Getting Ready for the Micro" will be the focus of the 1983 spring Information Industry Briefing Session conducted in four U.S. cities by International Data Corp. (IDC). The briefing session will be held in Boston March 4; Washington, D.C., March 7; Chicago, March 10; and Los Angeles, March 14.

The meeting will analyze current trends and prevalent technologies in the microcomputer arena and will include sessions on graphics, office automation, software and services, buying patterns and the strategies of AT&T and IBM. There will also be a half-day session on "Federal Government Markets" for microcomputers and related equipment and a luncheon session titled "Buying Your Own Computer."

Registration costs $395 for the first member of an organization and $345 for subsequent members. Further details may be obtained from IDC at Five Speen St., Framingham, Mass. 01701.

Meet to Cover DP Graphics

CHICAGO — "Graphics At Work" will be the theme of the National Computer Graphics Association's (NCGA) 1983 conference, which will take place here June 26-30.

Over 200 sessions will be conducted at this event on topics ranging from computer-aided design (CAD) to medical and educational applications of graphics systems, according to show sponsors at NCGA. Business and scientific graphics subjects covered will include strategies for integrating computer graphics into the organization, graphics in the information center, data base linkages and innovative applications of computer graphics.

Registration fees vary from $125 to $795, depending on session choices. Further information can be obtained from NCGA headquarters at 8401 Arlington Blvd., Fairfax, Va. 22031.

'Cars of Tomorrow' News

High-Tech Autos Stop The Show

By Bob Johnson
CW New York Bureau

NEW YORK — Hardware with a multimicroprocessor design, a touch-sensitive CRT with graphics, voice-activated control and satellite communications capabilities. That might sound like a new computer system, but when it was introduced here recently, it also had four wheels.

Automobiles incorporating all aspects of high technology were on display at the 1983 Greater New York Automobile Show, and the show stoppers were those with the most electronic gadgetry.

Nearly all of the 700-plus cars exhibited by U.S., European and Japanese manufacturers had some sort of computerized control designed into them. Familiar features such as electronic engine control, LCD dashboard readouts and computerized trip odometers graced many of the currently available production cars. New features like computerized mechanical and maintenance monitoring and interior temperature control were also on display.

The biggest attractions, however, were the cars billed by their makers as the "cars of tomorrow." And although much of the technology used in those cars has been around the computer industry for some time, its application in conjunction with America's traditional object of love proved to be another step toward general public acceptance of computer technology.

All of the "big three" manufacturers had their future cars on hand. Chrysler Corp. displayed its "Electronic Voice Alert" feature, which, the company claimed, is capable of compiling and processing information for 11 mechanical and safety functions, as well as giving the driver recorded voice reports. For example, if there are no problems when the car is started, the electronic voice will tell the driver, "All monitored systems functioning." The electronic voice is available in several languages, including English, French and Spanish, according to Chrysler.

One of General Motors Corp.'s "high-tech" automobiles at the show was the Buick Questor. The Questor, billed as "coming from the computer age," boasts a computerized road atlas that visually charts the driver's progress as he travels and a traction monitor that "feels" the road and recommends a safe driving speed for existing road conditions.

A spokesman manning GM's Chevrolet Division exhibit, John Berto, said that the 1984 Corvette will feature a "fully computerized dashboard" and will be labeled as Chevy's technical leader.

Perhaps the most ambitious and technologically advanced entrant in the show's high-tech arena was Ford Motor Co.'s Continental Concept 100.

Besides having a microprocessor on board for just about every function from front sonar-detection display to a rear seat Intellivision game, the car contains a 16K-byte Zilog, Inc. Z80A microprocessor hooked up to a 9-in. CRT capable of graphics display.

According to Mark Jarvis, a product design engineer at Ford's Electrical and Electronics Division in Detroit, the microprocessor's main functions are interior temperature-control activated by the touch-sensitive screen and supplying the driver with navigational data by linking up with a Navy communications satellite.

Jarvis explained that the car picks up latitude and longitude information from the orbiting satellite and the microprocessor translates the data onto a graphic map internally stored in the computer and shown on the CRT. The graphics present a moving symbol that represents where the car is located.

CW Photo by B. Johnson

Ford's Concept 100 has a 9-in. CRT that can display graphics.

Handbook Details Service Companies

PALMYRA, N.J. — *The Handbook of Independent Service Companies*, a "how-to" text offering nine steps to help management information systems managers evaluate independent service companies, has been released by the Service Research Group.

The book reportedly includes listings on hundreds of geographically indexed service companies.

It is priced at $995 from Service Research, P.O. Box 335, Palmyra, N.J. 08065.

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Officials Say Patriotism Played Small Part in IBM vs. NAS Choice

HOUSTON — Officials say the incident was overplayed by the general press, but they admit that patriotism played at least a small part in Harris County's recent decision to buy an American computer rather than a less expensive Japanese model.

Harris County will take delivery late this month on an IBM 3083-B mainframe at a total cost of $2.6 million after rejecting a National Advanced Systems, Inc. (NAS) bid for an AS/9040 processor priced at $2.3 million.

The decision probably would not have generated much publicity but for a small item in the committee's recommendation: "There were feelings expressed that in a time of heavy unemployment in the U.S., it would not seem proper to buy a machine that is basically produced by Hitachi [Ltd.] of Japan and only retrofitted to American specifications in the U.S."

The decision received considerable media coverage for its "buy American" slant. One article quoted a county official as questioning whether the IBM machine was worth the extra cash.

But County DP Director Frank Curcio said patriotism was not a significant factor in the committee's decision. "We preferred the water-cooled IBM over the air-cooled NAS because we already had the water cooling installed," Curcio said. "The NAS would have required about 10 times as much air conditioning.

"Also, we know we're going to have to grow this machine. To move to an NAS AS/9070 would double our air conditioning requirements, and we would possibly have had to add another computer room. The [buy American] concern was expressed by the committee, but it was blown out of proportion," Curcio said.

Karlstrom Wins Award

ORLANDO, Fla. — Karl Karlstrom, senior editor for computer science at Prentice-Hall, Inc., last week received the Annual Award for Outstanding Contribution to Computer Science Education from the Association for Computing Machinery's (ACM) Special Interest Group on Computer Science Education.

This is the first time a person other than an academic has been honored. Karlstrom accepted the award at the group's recent annual ACM Computer Science Conference.

Karlstrom, also an assistant vice-president at Prentice-Hall, joined the company in 1951. In the late '50s, he met a professor writing a book on data processing.

Although he was unfamiliar with the subject, Karlstrom informed the business books editor about it. The editor wrote back, "I have traveled the length and breadth of this country and have talked to the best people in business administration. I can assure you on the highest authority that data processing is a fad and won't last out the year."

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(In Canada: 416-279-4220.)

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Calendar

Week of March 6

March 9-11, San Francisco — **Minicomputer Systems: Guidelines for Successful Selections.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Week of March 13

March 13-16, Carmel, Calif. — **Advances in Office Automation.** Contact: Laurie Goldstein, Institute for Graphic Communication, Inc., 275 Commonwealth Ave., Boston, Mass. 02115.

March 13-16, New York — **1983 Trust Operations and Automation Workshop.** Contact: American Bankers Association, Communications Group, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

March 14, Boston — **Executive DP Seminar.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

March 14-15, Washington, D.C. — **Estimating Software Costs.** Contact: Data Processing Management Association Education Foundation, Dept. ESC, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510.

March 14-15, New York — **IBM Futures (1983-1988) — Taking Control of Its Market.** Contact: Techtran, 72 Cummings Point Road, P.O. Box 10212, Stamford, Conn. 06904.

March 14-15, Summit, N.J. — **ANS Cobol.** Contact: Chubb Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

March 14-15, Atlanta — **How to Use Desktop Computers in the Professional Design Firm.** Contact: Terri Connell, EMA Management Associates, Inc., 1145 Gaskins Road, Richmond, Va. 23233.

March 14-16, Seattle — **Conflict Management in the DP Environment.** Contact: QED Information Sciences, Inc., QED Plaza, P.O. Box 181, Wellesley, Mass. 02181.

March 14-16, Hartford, Conn. — **DL/I Application Programming Workshop.** Contact: New England Data Services, P.O. Box 92, Guilford, Conn. 06437.

March 14-16, Washington, D.C. — **Managing Data Processing Systems.** Contact: Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

March 14-16, Carmel, Calif. — **Automated Office of Tomorrow.** Contact: Institute for Graphic Communication, Inc., 375 Commonwealth Ave., 4th Floor, Boston, Mass. 02115.

March 14-16, Tempe, Arizona — **Fiber Optical Communications.** Contact: Center for Professional Development, College of Engineering and Applied Sciences, Arizona State University, Tempe, Ariz. 85287.

March 14-16, Washington, D.C. — **Managing Data Processing Systems in Multiproject Environments.** Contact: George Washington University, Continuing Engineering Education, Washington, D.C. 20052.

March 14-16, New York — **Long-Range Information Systems Planning.** Contact: American Management Association, 135 W. 50th St., New York, N.Y. 10020.

March 14-16, Boston — **Improving Automated Receivables and Credit Management Sustems.** Contact: American Management Association, 135 W. 50th. St., New York, N.Y. 10020.

March 14-17, West Berlin — **Computer Graphics Applications for Management and Productivity (Camp '83).** Contact: AMK Berlin, P.O. Box 1917 40, Messendamm 22, D-1000, West Berlin 19, West Germany.

March 14-17, New York — **Basic Vsam.** Contact: Software Education Corp., 1114 Ave. of the Americas, 37th Floor, New York, N.Y. 10036.

March 14-18, New York — **CICS/VS Macro Level Applications Programming.** Contact: Rosa Roseta, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036.

March 14-18, Los Angeles — **CICS/VS Applications Programming.** Contact: On-Line Software International, Fort Lee Executive Park, 2 Executive Drive, Fort Lee, N.J. 07024.

March 14-18, New York — **CICS Macro Level Programming.** Contact: Sysed, 1 Park Ave., New York, N.Y. 10016.

March 14-18, Boston — **Financial Modeling.** Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

March 14-18, New Orleans — **IMS Systems Management.** Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

March 14-15, Summit, N.J. — **ANS Cobol.** Contact: Chubb Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

March 14-25, Summit, N.J. — **OS/370 Assembler.** Contact: Chubb Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

March 14-25, Summit, N.J. — **Assembler Language Coding.** Contact: Chubb Advance Training Center, 480 Morris Ave., Summit, N.J. 07901.

March 15-17, Houston — **SAS Processing Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

March 15-18, Los Angeles — **Hands-On Unix Workshop.** Contact: Ruth Dordick, Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

March 16-17, Dallas — **Developing Small Computer Applications in Government.** Contact: U.S. Professional Development Institute, Dept. 1, 12611 Davan Drive, Silver Spring, Md. 20904.

March 16-18, Los Angeles — **Multiuser Communication Systems and Networks.** Contact: Continuing Education Institute, 5410 Leaf Treader Way, Columbia, Md. 21044.

March 16-18, Toronto — **Intermediate APL.** Contact: Numetrix Seminar Administrator, Numetrix, Ltd., Suite 600, 3 Church St., Toronto, Ont., M5E 1M2, Canada.

March 16-19, Chicago — **Systems Project Management.** Contact: Arthur Andersen & Co., 69 W. Washington St., Chicago, Ill. 60602.

March 17-18, Boston — **Software: A Legal Briefing for EDP Professionals.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

March 17-18, Cary, N.C. — **SAS Color Graphics Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

March 17-18, Providence, R.I. — **Effective DP Project Management.** Contact: The Center for Management Development, Bryant College, Smithfield, R.I. 02917.

March 19, Silver Spring, Md. — **Introduction to Pascal.** Contact: Linda Zurndorfer, IEEE Computer Society, P.O. Box 639, Silver Spring, Md. 20901.

Henco User Conference Set for Orlando, Feb.27

ORLANDO, Fla. — The Henco Software, Inc. Users' Group's Second National Conference is slated to take place here Feb. 27 to March 3.

The 1983 program focuses on Henco software products for personal and departmental computing applications, according to a vendor spokesman. Topics on the agenda will include the analysis, design and implementation of Henco's proprietary Info relational data management systems; managing macro libraries and large data bases with Info; use of Info for college administration, market analysis, manufacturing management and materials requirement planning.

Conference registration costs $175. Details are available from Henco, 100 Fifth Ave., Waltham, Mass. 02154.

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EDITORIAL

A Friend of Ours?

There's something very uncomfortable about the recent selection of Adm. Bobby R. Inman as president and chief executive officer of Microelectronics and Computer Technology Corp. (MCC), the multivendor research and development venture spearheaded by Control Data Corp. [CW, Jan. 31].

The fact that Inman, former head of the National Security Agency (NSA) and deputy director of the Central Intelligence Agency, has no corporate management experience or technical background alone raises questions about the wisdom of putting him in charge of this high-visibility, high-risk undertaking. Even more noteworthy is the fact that during his very successful career as one of this nation's top spies, Inman showed that he is no friend of the DP industry.

Inman is the man who one year ago suggested that published data on advanced research in computer hardware and software and other sophisticated electronics is a threat to national security and should be subject to government censorship. The admiral backed down from that position before pointed congressional questioning, and his thesis was convincingly refuted by a subsequent study by a National Academy of Sciences panel, but not before his statements provoked a storm of outrage in the industry.

Inman insisted last year that his statements on technology and national security were made not as a government official, but as a concerned private citizen. If we are to take him at his word, we can only infer that he is philosophically opposed to the aggressive and unfettered R&D that has made the American DP industry so successful.

In a recent interview [CW, Feb. 14], Inman said MCC research will give the participating firms a three-year lead in the resulting technological developments. This is just about the lead NSA reportedly strives to maintain over mainstream commercial electronics. As head of NSA, Inman showed how very interested that agency is in advanced technology developed by private firms. Can he really be expected to guard MCC secrets if his former buddies in the intelligence community come calling? Maybe, but doubts will always linger.

Inman, as an executive of the high-tech intelligence world, proved himself to be a skilled politician and is, no doubt, a master at keeping secrets; both of these attributes will serve him well as head of MCC. But what else is there about Inman to recommend him for this job? According to a CDC spokesman, Inman was chosen for the top MCC job because "he understands the role electronics plays in the national and international scene." Based on his past actions, however, we're not sure he understands its proper role.

Given the importance of MCC and its possible offspring, we wish Inman and MCC well. But in light of his past performance vis-a-vis the high-tech industry, his appointment is not only uncomfortable, it's downright spooky.

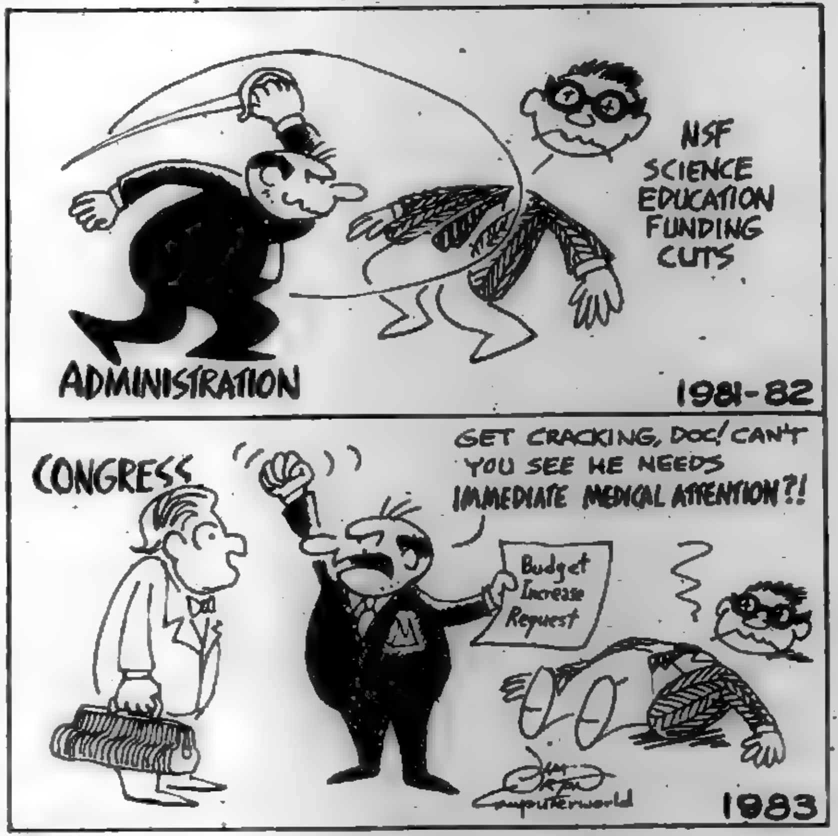
DATA PAST

Five Years Ago
Feb. 20, 1978

WALTHAM, Mass. — Honeywell Information Systems, Inc. announced four Level 6 minicomputers, two of which — the Model 53 and Model 47 — it aimed at the hearts of commercial users.

Ten Years Ago
Feb. 21, 1973

BOSTON — More than 300 products valued at over $10 million and 18 workshops on installations provided the sparkle on the exposition floor as Computer Caravan/73 was launched here.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LETTERS

Eliminating a Good Market

California Computer Products, Inc. read with regret the article "Houston Dropped as NCC '84 Site" [CW, Jan. 24]. As a long-time National Computer Conference exhibitor, we have been to many cities for the NCC show, and each city has its pros and cons.

It is, perhaps, worth pointing out that the so-called appalling conditions in Houston that the Shugart Associates' trade show coordinator speaks of in the article did not keep the more than 90,000 individuals (an all-time high) from attending.

Our concern is that by eliminating Houston as a site, a large market — and for us a very good market to show our wares — is eliminated.

Limiting NCCs to Las Vegas, Chicago and Anaheim, Calif., limits the scope of the show. It is a fact that a show usually draws a majority of its attendees from a 300-mile radius, no matter what the show. We think that in eliminating Houston, Shugart is being a little shortsighted.

By the way, those of us attending NCC in Houston did not, for the most part, experience much of the hot, sultry weather referred to in the article; we were in an air-conditioned hall, air-conditioned buses or cabs, air-conditioned hotels, air-conditioned restaurants and so on. And, as a matter of fact, the evenings were quite pleasant.

What's more, the hot, sultry weather of Houston is no more or less of a discomfort than the snow, slush and freezing cold many of us as exhibitors run into at shows held in Chicago, Philadelphia, New York or Detroit in the winter. In fact, these latter conditions are even worse because many times they are responsible for closing an airport, thereby preventing potential attendees from coming to the show.

As for the claim that in Houston, hotels were spread all over town — we have that in Anaheim. When NCC comes to Anaheim, companies sometimes have to book their people as far south as Newport Beach, Calif., and as far north as Los Angeles — a stretch of more than 80 miles. And I've been booked in hotels in Chicago and New York that were in questionable neighborhoods and unclean. These are problems that can be found in any large city.

The claim that the exhibit hall in Houston was in "grave disrepair" might be a bit exaggerated. I believe that if the American Federation of Information Processing Societies, Inc. (Afips) would voice such a concern to the convention center people, the problem might be remedied before 1984.

And what about the good points of Houston? We found the people in Houston to be very friendly. We did not have the labor union problems that we have had in other cities. Nor did we feel that we got ripped off in paying for hotels, meals or other items — something that we often feel in other cities.

Though we don't believe that this letter will change Afips' thinking, we do, at least, want to present the other point of view.

Houston, we'll be glad to attend any trade show located in your city.

Carol Felton
Public Relations Manager
California Computer Products, Inc.
Anaheim, Calif.

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. Letters may be edited for purposes of brevity and clarity. Letters should be addressed to Editor, *Computerworld*, 375 Cochituate Road, P.O. Box 880, Framingham, Mass. 01701.

LECHT ON SCIENCE / Charles P. Lecht

Shattering the 'Information Bottleneck'

'Clearly, we'll have to shift some part of our attention away from the creation of more and more information and niftier and swifter means for its delivery. The overriding need will be to focus on the deeper challenge of forming more penetrating, meaningful questions.'

Let's grind our molars just a bit today and imagine that the infamous "information bottleneck" had truly been broken (or, if you prefer a less jagged metaphor, heroically dilated virtually to the vanishing point). Our Information Age has, in this hypothesis that verges so closely upon this morning's official truth, matured to the point where information flows into our lives with the same lack of human concern as electricity into our toaster ovens.

Friends, do you realize how difficult it is, in this best of all possible worlds, to claim ignorance as an excuse for either infirmity of purpose or outright error? Even granting that one has infinite access to information, a modicum of natural (as opposed to the vaunted artificial) intelligence is requisite for transforming it into *knowledge* is wanting.

Chances are that no adult version of finger-pointing will serve to exonerate us from the heartbreak and embarrassment of being publicly perceived as uninformed during the Information Age. Why, that would be like being without brass in the Age of Brass — worse, maybe. Not for us the disingenuous disclaimer of the unprepared junior high schooler that "my little brother ate my homework."

Just what can we say in our own defense? Ah, yes, we forgot to pay our telephone/cable/broadcast reception facilities bill and, so, were disconnected; or we took umbrage at the unconscionable size of that bill and are temporarily, but virtuously, standing on the world's most respected principle: that is, penury (not poverty, which is a very different matter from and even more shameful than absentmindedness or sloth).

But almost certainly sooner rather than later, the Peripheral Papacy, unanimously supported by the counsel of the Cable Curia, will declare being uninformed the least sympathetic or pardonable of human sins.

Now that we have scared ourselves out of our wits with this nightmarish scenario, let us seek refuge in the bosom of the present.

Information Age Is in Its Infancy

Obviously, nothing of what I have proposed thus far will be true as soon as tomorrow. The Information Age is in its infancy; not the faintest trace of sinister peach fuzz calls the smile upon its rosy lips into question, and the rigors of its adolescence are even more remote — as remote as the wicked witch of the west in the land of Micro-Oz. Just the same, you, too, were once a boy scout or girl scout and, baby, look at you now. Where there is no pressure — even tacit pressure — in the present, there is no future: So, to continue with our image, there is everything to recommend "being prepared" which, in turn, bespeaks the underlying optimism that informs this article.

For one thing, your inability to afford all the high-tech instrumentation that would keep you perpetually on-line to monstrous data repositories and provide you with instant access to anything you might want to know and display (17 ways from Sunday including, perhaps, via direct infusion into the visual and other high-level cortical silver screens of your brain) won't render you obsolete as quickly as some suggest. Enough data can and will find its way to you at tolerable cost and keep you safe and warm and a part of the big picture.

But a new problem looms, beside which the challenge of popping out the other side of the information bottleneck looks positively trivial. I call it the "question bottleneck."

The Question Bottleneck

Like the monsters that emerged from the id to annihilate the Krel, the question bottleneck is a creature of our own devising.

Until now, the principal virtue of the information bottleneck was that it provided camouflage for the uncounted legions of us who used it for cover when we could not produce an answer. Some of us were even pleased to leave the impression that were it not for the intractable cork in our computer bottle, we would have been free to soar on the glistening wings of near infinite knowledge to unprecedented heights of performance.

Now fate, mediated by technology, is dealing us a deflating blow. We are becoming free not only to ask questions, but to obtain quick answers on practically any subject. Such "if only ..." pretensions that we clung to in order to explain away our occasional awkward silences must now be acknowledged for the intellectual window dressing they usually were.

In the good old, bad old days, we were prevented from asking more than a few stupid or irrelevant questions per day by the always accommodating information bottleneck. With this user-friendly obstacle removed, "right answers," like slaves in a Grade B movie, are set free to overwhelm us, no matter what the utility, superfluousness or spaceyness of the questions.

Apart from providing each of us with his own copy of the emperor's new clothes, this torrent of un-quality-controlled information could conceivably swamp even our serious efforts to improve anything at all. Yup, we're getting the information all right. And what's the message?: Simply that we haven't a clue what to do with it.

I do not here ignore the possibility that intelligently formulated and

(Continued on Page 30)

HUMAN CONNECTION / Jack Stone‡

Improved College-Industry Relations Urged

This is the sixth article in a six-part series, "Computers and the Collegians," coauthored with Joanne Barker.

According to three college seniors we talked with, computer science programs on campus need a lot of help.

We asked the youthful critics to come up with some practical ideas on how to improve matters, and we listened closely to their comments, hoping that their astute observations might awaken some concerns by industry leaders.

Pearl Marshall, a computer science major at a small private college, focused on the issue of vocational guidance.

"In my college, it seems that the data processing industry is in no way connected with the computer science program; I can't find anybody on the faculty or administrative staff who appears to know — or care about — what jobs might be available or what we have to do to qualify for them," she said. "If they do know, they certainly keep the information secret."

Practical Program

"I'd think it would be very helpful if the industry representatives, at least those from local firms, would meet with members of our college administration to work out a practical communications program to help guide us in the planning of our computer careers," she said.

"The program could include such projects as a special bulletin board dedicated to displaying job openings, well-publicized presentations from industry specialists on what computer-related jobs involve, narrative write-ups on current jobs and recommended curriculum selections to meet particular job needs."

Bob Stewart, a philosophy major at a private college, was surprisingly practical in his approach to acquiring data processing experience.

"The idea of gaining a so-called 'computer education' in college [illegible] misplaced," he said. "The ability to understand the basics of computers in business is strictly a utilitarian function that involves skills that can be acquired in a specialized training facility like a trade school or junior college.

"My suggestion is that a college should consider a program much broader than we now have to deliver what students really need, and I agree with Pearl that industry representatives should participate in its development."

Three Facets

"The program should have three facets: first, academically oriented courses in the computer sciences that cover the theories underlying the technology; second, applications-oriented courses to present the advanced notions of business data processing systems; and third, a mandatory work-study project whereby students receive data processing apprenticeships in industry to gain practical experience," he said.

"Of course, it would be nice if the students were paid a decent salary while in work-study, but if they get only minimum wage, that's OK, as long as academic credits are awarded."

Tony Charles, a business major at a large state university, described the data processing services that are provided by the computer center at his university.

"I was pleased to take Introduction to Computers as an elective for my major, but my adviser never told me I'd have to wait in line two or three hours to get a keypunch and be restricted to 50 minutes hands-on after I arrived," he said.

System 'Was a Joke'

"The university's batch system was a joke — eight keypunches for 40,000 students, with a one-day turnaround for job processing," he said. "I frequently had to plead with the teaching assistants to excuse the tardiness in delivering my programs because my job was stuck in an input queue.

"Sometimes the frustration was so intense that I wanted to drop the whole idea of a computer career at times, and many of my friends felt the same way. If the department was really trying to excite us, its efforts were subverted by the computer center.

"I suggest that industry DP managers — assuming they know what they are doing — come to campus to help straighten out the center's mess before all the students are turned away from computer careers."

LETTERS

A Limited Picture

In "Consultant Sees DP Mystique Disappearing" [CW, Dec. 6], consultant Chuck Tesler presented a limited picture of microcomputers and the responsibilities of most data processing departments.

The microcomputer is a very powerful tool and, if used properly, can play a significant role in improving DP capability and personnel productivity.

In addition to this, Tesler's comment about comparing IBM 3081 response time with a micro's was without regard to what jobs were being done on the two types of systems in question.

Some significant points were missed in the article. First, in order to make the microuser most productive, the microcomputer itself should be supplied with the proper data, which will be used in conjunction with the various spreadsheet or analysis programs that are available.

The data should be supplied through communications with a mainframe. Properly supplied with data, the microcomputer can be a powerful analysis tool and can be used to offset or take the burden off the mainframe.

But the data base that it is supplied with is important, and how the data base is supplied can, if not handled properly, be very expensive to a business.

Second, any person who has been in the DP field for some time realizes that, in terms of efficiency, it is best to get the most user involvement possible in any application. Microcomputers, to the extent that they can assume more of the data processing burden, go a step beyond interactive or on-line applications in providing user involvement.

From an administrative point of view, Tesler stressed the low cost of the microcomputer. This is, I agree, an attractive feature.

Another thing to be considered is the education of users. It can be very expensive if a user is not educated and, in effect, chooses to educate himself on company time.

Maintaining the integrity of the total system is where our responsibilities lie today. And we must remember it is not the case that everything printed on computer paper is gospel.

Ed Becker
Vice-President
Information Services
Medline Industries, Inc.
Northbrook, Ill.

Getting Information

(Continued from Page 29)

precisely expressed questions producing the irrefragably "correct" answers will, from time to time, yield useful and exciting results. But there is nothing in this view to lead us to expect the *actual percentage* of such questions to increase, whatever the speed of the answers they elicit. Clearly, we'll have to shift some part of our attention away from the creation of more and more information and niftier and swifter means for its delivery. The overriding need will be to focus on the challenge of forming more penetrating, meaningful questions.

This new emphasis may yet rescue us from the onslaught of mindless, machine-reliant ingenuity that has, as an unexpected by-product, eroded our motivation to consider just what it is we want to know and precisely why. Once this is done, the Information Age, successor to the Age of Innocence, progenitor of the Question Age, will stand in the history of our species as a second Age of Gold.

Lecht is president of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

SCIENCE/SCOPE

Fusion energy machines that would turn sea water into electricity, though still 20 years away, are a step closer to fulfilling their promise of satisfying much of the world's energy needs. In plasma-heating experiments, Hughes Aircraft Company researchers have demonstrated a gyrotron with the highest performance yet reported. It produced 285 kilowatts at 60 gigahertz at 45% efficiency under pulsed conditions. The short-range goal of this research program is to generate 200 KW at 60 GHz with long pulses in excess of 100 milliseconds. The long-range goal is to generate 1 megawatt at 100 GHz. The Oak Ridge National Laboratory sponsors the program for the U.S. Department of Energy.

Technologies of laser holography and diffraction optics have led to an experimental visor for protecting military pilots from potentially blinding laser beams. The visor reflects light at wavelengths used for lasers without significantly reducing visibility. It would replace devices employing dyes, which produce distracting discolorations, absorb light, and cut visibility. Designed by Hughes for the U.S. Navy, the visor could be adapted for ground troops.

An Advanced Medium-Range Air-to-Air Missile has intercepted a drone target, showing its ability to find low-flying targets amid high clutter caused by the missile's radar returns reflecting from the ground. The prototype AMRAAM was fired from an F-15 fighter from an altitude of 16,000 feet and a range of about 13 miles. The remotely controlled target flew toward the F-15 only 400 feet above the ground and operated an electronic countermeasures pod in an effort to jam the missile's seeker. Hughes is producing AMRAAM under a full-scale development contract for the U.S. Air Force and Navy.

A cleanroom believed to be the world's largest serves as the birthplace for such military electro-optical devices as laser rangefinders, laser designators, and infrared night vision systems. The new Hughes complex spans 60,000 square feet. It is environmentally controlled to be free of contaminants because even one particle of dirt barely visible to the naked eye could ruin sensititive optics. Although the electro-optical components themselves are delicate and require meticulous assembly, a completed device is hermetically sealed and built to withstand rugged use in the field.

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Midstream Switch From Cobol

Insurer Navigates Language Change

BALTIMORE — Is it possible for a Cobol-based DP department to change, midstream, to another programming language?

Apparently Blue Cross of Maryland thinks so. This organization has adopted Pro/Grammar, an applications development and information retrieval package from Pansophic Systems, Inc., an Oak Brook, Ill., firm.

"Pro/Grammar has been decreed an official programming language now," Bill Lumpkin, manager of training and senior systems programmer for Blue Cross of Maryland, explained.

"People are encouraged to put Pro/Grammar into production," he continued. "It will be used for all report-type work, and we expect Pro/Grammar to be used for low complexity data extraction and file manipulation. It will also be used for reformatting, reorganization, test data development and/or extraction."

Prior to the introduction of Pro/Grammer, Cobol was the only official programming language at the firm, which is a medical insurance company that serves the state of Maryland. There are approximately 175 people in the data processing department of Blue Cross of Maryland and, of these, 80 comprise the applications programming staff. A second programming staff of 25 people handles government systems. A computer center consisting of an IBM 3033 running under MVS with TSO, and CICS with IMS, is shared with Blue Shield of Maryland.

The Blue Cross programming personnel will be trained in Pro/Grammar via a training course developed in-house, which runs from simple report generation to complex file matching. "All of the non-EDP users (financial underwriting) who currently have access to TSO will be trained in Pro/Grammar," Lumpkin said.

(Continued on Page 36)

IBM VM/SP System Program Adds Resource Management

RIDGEFIELD, Conn. — Adesse Corp. has announced the availability of a programming extension to the IBM VM/SP System Control Program.

The VM/SP System Resource Manager (SRM) is a three-level, hierarchically structured programming extension of the IBM VM/SP System Control Program. The SRM's function is to make decisions regarding the allocation of the resources of a real computing system that executes VM/SP.

The system establishes and enforces installation policy regarding the priority of resource allocation and, therefore, controlling relative user performance, the vendor stated. The System Resource Manager also provides favored virtual supervisor support, which permits a virtual machine that alters its resource needs and associated performance profile to be favored without causing some of the more undesirable effects of standard favoring facilities.

SRM is offered with a per-CPU license for a monthly charge of $3,000, which includes maintenance. The purchase price for SRM is $60,000 per CPU, according to the vendor.

Adesse can be contacted through P.O. Box 515, Ridgefield, Conn. 06877.

MSA's 'Cets' Tailored for IBM

ATLANTA — Management Science America, Inc. (MSA) has unveiled the Capital Expenditure Tracking System (Cets), which was designed to operate independently or integrate with MSA's Fixed Assets Accounting System (Faas.)

Cets runs on IBM and plug-compatible 370, 30 series and 4300 systems under DOS/VS(E), OS/VS1 and OS/VS2. It is intended to provide information on current and anticipated expenditures by identifying potential problem areas before they lead to overexpenditures or overcommitments, the vendor noted.

Its project tracking features include comparing and reporting actual and budgeted amounts, calculating estimated completion costs, flagging cost overruns throughout the project, forecasting future project payments, reporting interest expenses by project and providing control by identifying such costs as property units, indirect charges, fees and permits, freight, taxes and interest. The software reportedly compares percent of completion by actual expenditures vs. appraisal, tracks quantities by purchase order and invoice, provides material reporting including quantity received and determines the cost basis for book and tax accounting.

Reports produced by Cets include completion cost estimate, project status report, project commitment analysis, project variance report, projected payments report, actual payments report and inventory list.

Cets is priced between $20,000 and $30,000, depending on the configuration and options selected, the vendor said from 3445 Peachtree Road N.E., Atlanta, Ga. 30326.

'V/Quick' Slashes Response Time

ARLINGTON, Va. — VM Systems Group, Inc. has announced V/Quick, a program that reportedly cuts response time in IBM VM/CMS environments by as much as 50%.

The package reportedly speeds up paging for the interactive user. It is said to have the most dramatic effect on heavily loaded configurations with paging on moving head disk drives, the vendor said.

The package is a modification to IBM's VM/SP operating system. It affects five command program modules and adds one additional module. The package is available for releases 1.0 and 1.1 of VM/SP. The package costs $4,990, and installation takes about eight programming hours. Source code and updates are furnished, the vendor said from Suite 14, 3123 N. Military Road, Arlington, Va. 22207.

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'File-Aid,' 'Abend-Aid' Out

BIRMINGHAM, Mich. — Compuware Corp. has announced two new software tools for IBM DOS systems.

File-Aid is a multifunction, parameter-driven product that consolidates the most commonly used IBM utility functions, a spokeswoman said. Available in both batch and Structured Programming Facility (SPF) versions, the package allows for allocation, browsing, updating and manipulation of data files, regardless of the file organization, access method or storage medium.

Under SPF, the utility supports all access methods without using the Idcams utility. Users can print, browse or dump records in character and hexadecimal format selectively, according to the vendor.

File-Aid allows JCL partitioned data sets to be handled logically. Interactive capabilities extend the power of SPF, allowing data sets to be searched and updated through any access method. The price range is from $7,200 to $15,100 for SPF and from $5,200 to $10,800 for batch, depending on options.

The company's Abend-Aid diagnostic package has been expanded to include DOS DL/1, the spokeswoman said.

The major category of errors analyzed by the latest release is for DL/1 system error messages. Abend-Aid is said to determine the exact reason for the problem. The tool also reportedly identifies the status of the data base, formatted contents of each current segment involved with the error and results of the last eight calls to the data base.

Prices range from $6,500 to $12,500 for OS, $3,800 to $6,500 for DOS and $5,300 to $8,200 for DOS DL/1, depending on CPU type. Both products are available from 32100 Telegraph Road, Birmingham, Mich. 48010.

IBM MVS Users Get JCL System

HERNDON, Va. — Software Corp. of America has unveiled a system said to allow IBM MVS users to catalog, maintain and execute JCL from their own private procedure libraries (Proclib).

Easyproclib reportedly allows an unlimited number of Proclibs to be established. Private procedure libraries can be developed for each department, production application, development group, programmer or major job.

The software was designed for large IBM computers operating under any release of OS. A 30-day trial period is available for the $6,000 package, which comes with one year of free maintenance, according to the vendor. Software Corp. of America is located at 455-A Carlisle Drive, Herndon, Va. 22070.

Schedule System Fits IBM's VM

FALLS CHURCH, Va. — VM Software, Inc. has announced VMDefer, a schedule system for IBM's VM that is said to offer security features, management reports and a central data base of all events scheduled.

A vendor spokesman said VMDefer reduces prime-time loading by allowing users to schedule routine tasks and programs during off-prime time. VMDefer also includes resource limiting facilities that allow it to be substituted for CMS batch processing.

A permanent license fee costs $2,500 from VM Software at 7777 Leesburg Pike, Falls Church, Va. 20043.

Office Automation: Without Proper Planning, THIS May Be the Button You Hit Most Often

At the first OA Forum, sponsored by *Computerworld OA*, industry experts and leading-edge users unanimously agreed: thorough planning is the critical factor determining office automation success.

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Sharing their insights on OA planning, integration and implementation issues are, among others: Dr. Michael Hammer, associate professor at MIT; Dr. John McQuillan, assistant to the president of BBN Information Management Corp.; Patty Seybold, principal editor of The Seybold Report on Office Automation; and John Walsh, Communications director of Avon Products, Inc.

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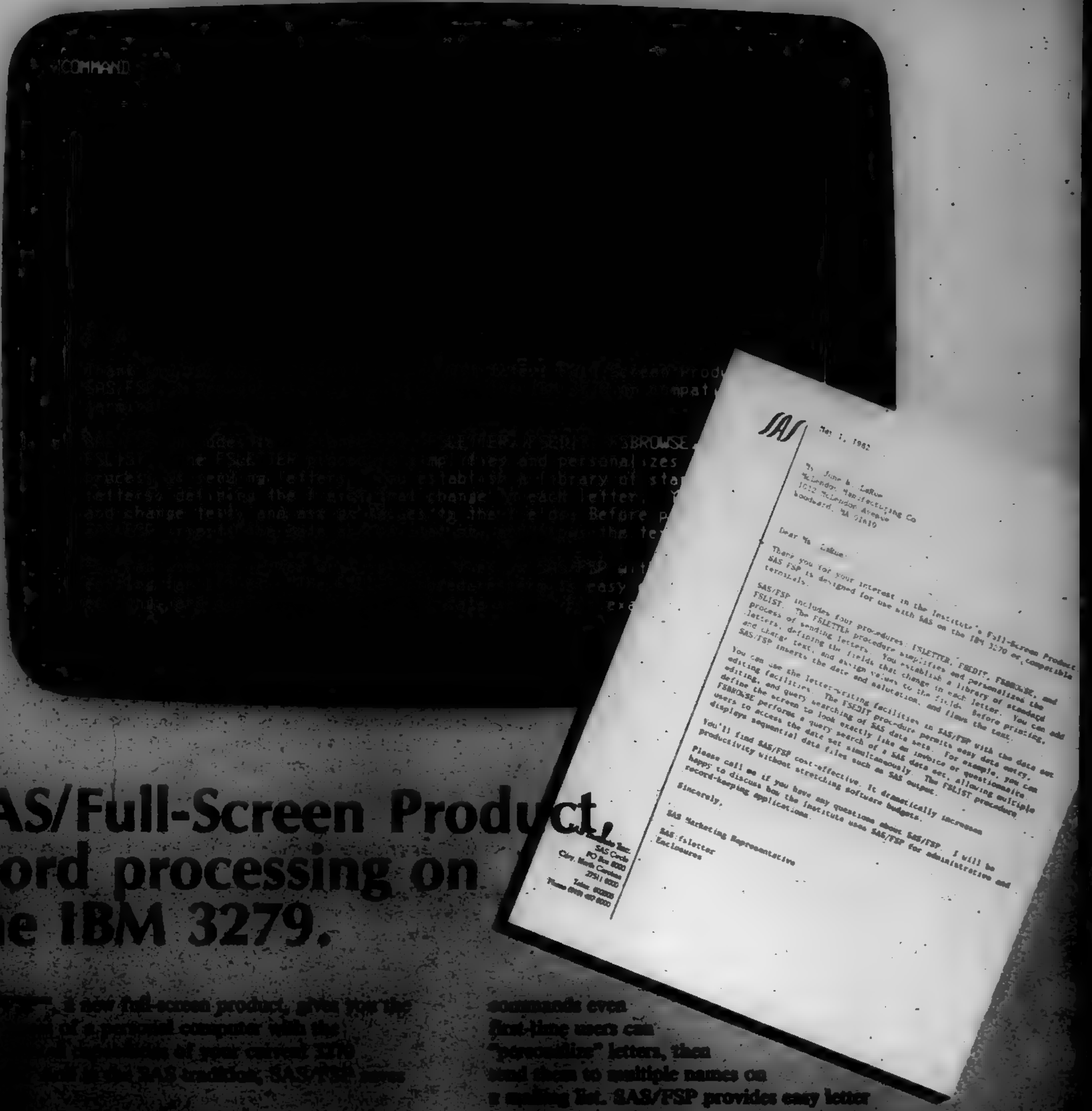

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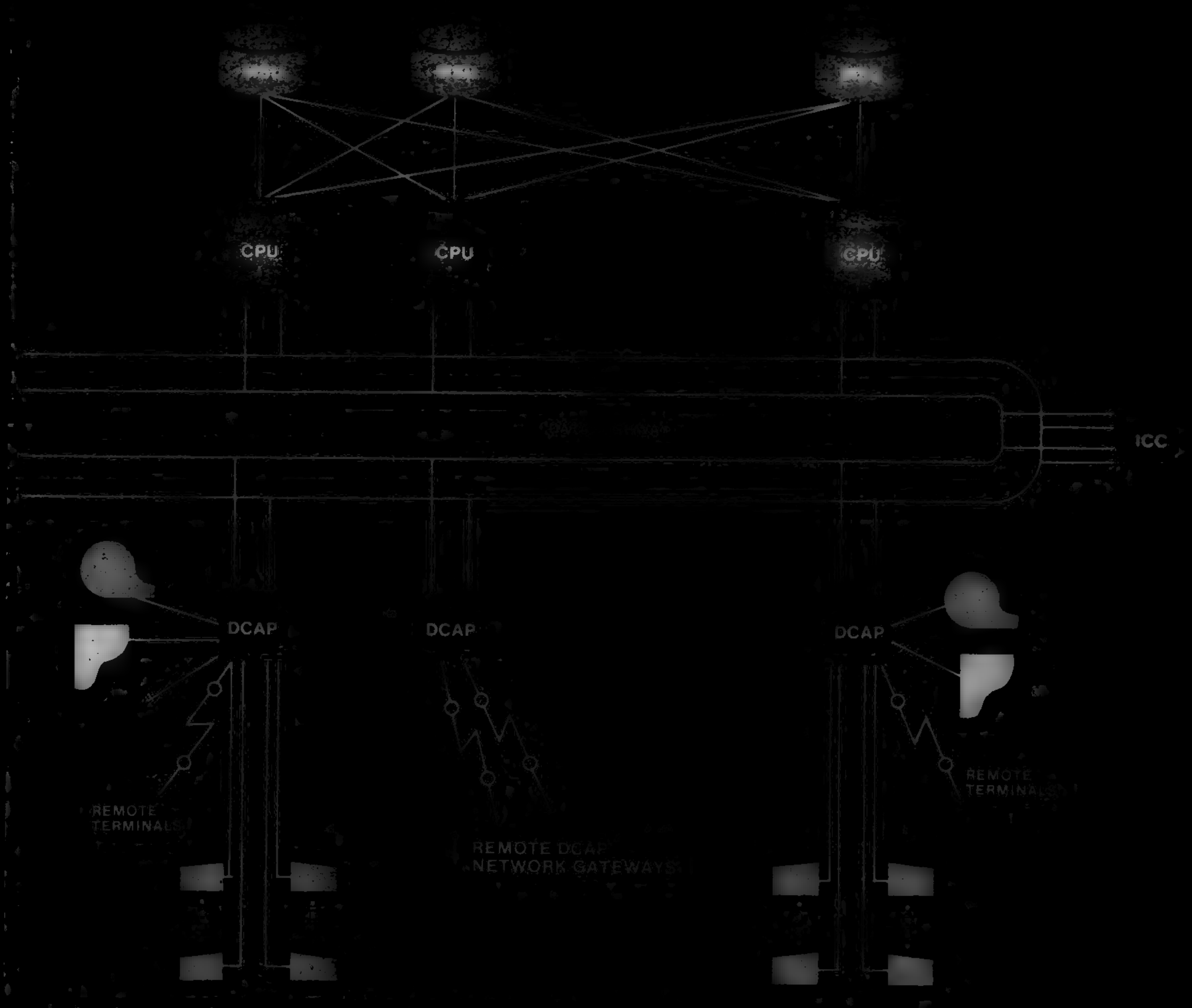

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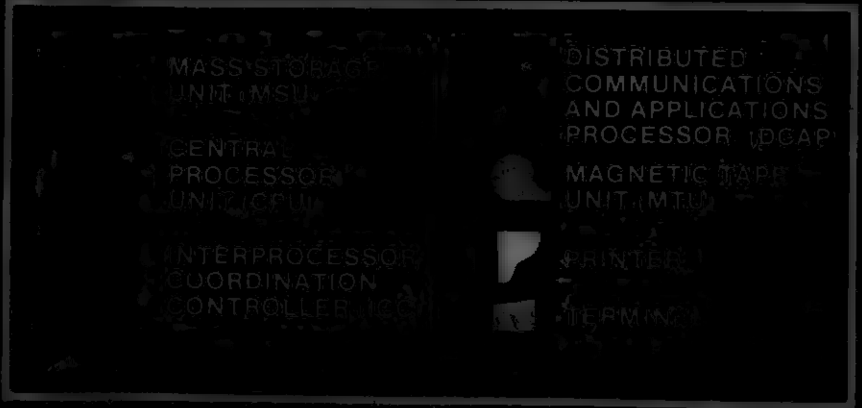
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Gould Unix-Related Ada, Pascal Compiler Out

FORT LAUDERDALE, Fla. — Gould, Inc.'s SEL Computer Systems Division has announced two Bell Laboratories Unix-related software products for the Gould Concept/32 family of 32-bit computers. The Ada and Pascal products are said to be the first in a series of products committed to the Unix environment.

The Gould implementation of the Ada compiler translates a comprehensive subset of the Ada language. The Pascal compiler, which also runs under Gould's authorized version of Unix, is said to be compliant with international standards. Both compilers generate machine code via the C compiler for the Concept/32 family of computers. Object programs can execute at raw machine speeds and Ada, Pascal and C subprograms can be mixed together, the vendor said.

Usage charges for the Ada and Pascal compilers are $10,000 and $6,000, respectively, under a licensing agreement from Gould SEL, located at 6901 W. Sunrise Blvd., P.O. Box 9148, Fort Lauderdale, Fla. 33310.

Md. Insurer Switches Languages

(Continued from Page 31)

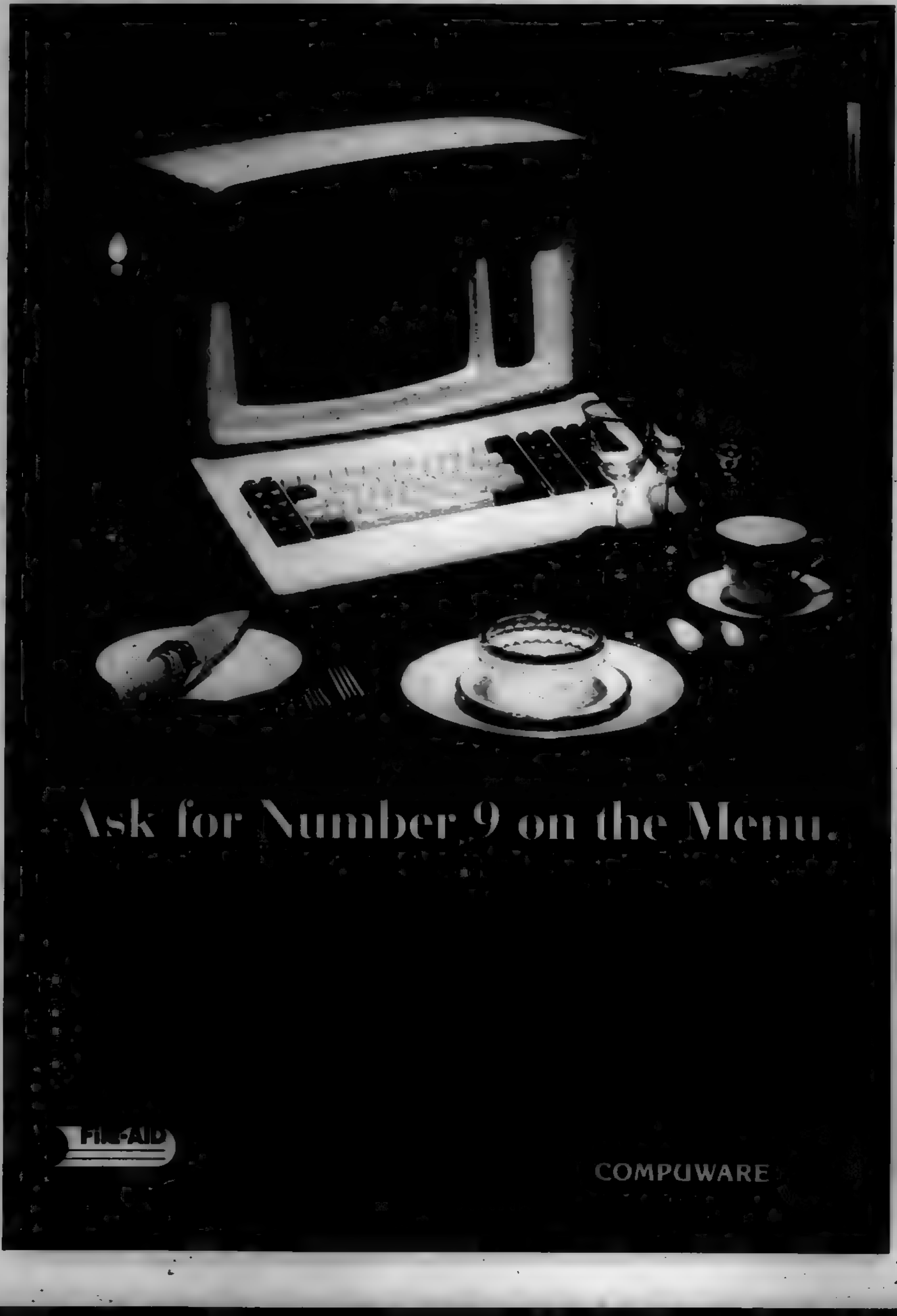
"In addition to giving them the language training, we anticipate the development of some menu screens under CICS, where the user would be able to select options or fill in the blanks. Pro/Grammar is structured and syntactically organized, and we feel it should be fairly easy to do this."

The main benefit of Pro/Grammar, according to Lumpkin, is "its ease of coding. It is many times easier to code in than Cobol.

"In the future, Pro/Grammar will become an integral part of our production language, so that significant portions of any system could be written in Pro/Grammar as opposed to Cobol,'" he said. "One of the things that we like best about Pro/Grammar is that you only have to specify the working fields that you want."

The Pro/Grammar training course at Blue Cross of Maryland runs two hours per day, spread over two weeks. Each session assigns "homework," building upon the previous assignment. The training varies, depending on the knowledge/experience level of the attendees, Lumpkin said. "We have a two or three day add-on to cover more sophisticated users. Once we have run our class by about 40 to 50 people, we hope to convert it from a stand-up instruction to a computer-based interactive training system. This will provide step-by-step instruction for new users. I see this as an opportunity to provide Pro/Grammar training for new people without using instructors for just one or two people, especially since people at the same position level often work at different speeds."

The general feeling at Blue Cross of Maryland is that the use of the new Cobol alternative will help deal with the backlog of user requests to DP. "We believe that users will now be able to handle a number of their own requests," Lumpkin said. He added that the product should save time. "We feel that it will enable a programmer to ask himself 'What if?' and dash out a quick program."



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CA-Raps Release 2.0 Allows Access to Power/VS(E) Files

JERICHO, N.Y. — Computer Associates has announced Release 2.0 of CA-Raps, an IBM DOS/VS(E) product that reportedly allows access to Power/VS(E) spool files from 3270-type terminals or printers operating under CICS/VS.

The product supports IBM's 6670 printer including operator command language and offers a job accounting interface. CA-Raps utilizes remote printers to deliver information online, a spokesman said. Increased security features in Release 2.0 are provided through an expanded command table, report distribution utilities and enhanced screen formats.

The command table allows authorized lists of commands, user-level key/command assignment, definition of command synonyms and command user-exit routines. Report distribution makes it possible to separate and regroup reports without the need to change the original program. Report sharing allows a report to be printed at multiple CICS/VS printers concurrently, the company claimed.

CA-Raps costs $4,100 for a three-year lease from 125 Jericho Tnpk., Jericho, N.Y. 11753.

Monitor Targets DEC, IBM CPUs

PALO ALTO, Calif. — Xidac Inc. has introduced a performance monitor said to allow users of the vendor's portable Mainsail programming environment to identify and monitor code areas. Among the machines it will run on is the Digital Equipment Corp. VAX-11/780 and the IBM 4331.

MainPM reports the amount of time a module or procedure is active, the time spent within each module or procedure, the various statements executed in each module or procedure and the number of times each statement in a module is executed. The program also allows users to see an unexecuted program's procedures or statements.

The package is available for the 4331 or the VAX-11 for $4,000 from Xidak, Inc., Suite 101, 530 Oak Grove Ave., Menlo Park, Calif. 94025.

ESP Announces Control System

ARMONK, N.Y. — Exact Systems and Programming Corp. (ESP) has unveiled an Information Management Control System (IMCS) said to provide performance enhancements in three major areas: application development, computer-resource utilization and systems responsiveness.

DNA-4 IMCS was designed to operate in standard releases of Data General Corp. AOS, AOS/VS and Rdos operating systems and Rolm Corp.'s RMX-Rdos.

An automated program technology is included in DNA-4.

The resources of the system are managed by a data base management system, which is an integral part of DNA-4. Some of the features are a data dictionary facility, an audit trail, data compression and decompression, up to 32 index/file; concatenation of fields in an index to perform an on-line sort and automatic reutilization of released storage space.

DNA-4 IMCS is licensed for use on specific DG and Rolm computers and may be copied only for backup purposes. The license fee for DNA-4 ranges from $4,400 for a DG Microeclipse S-20 to $50,000 for a DG MV-8000. Monthly rentals range from $750 to $2,750. A software subscription service is also offered.

ESP is located at 1 Labriola Court, Armonk, N.Y. 10504.

TP-270
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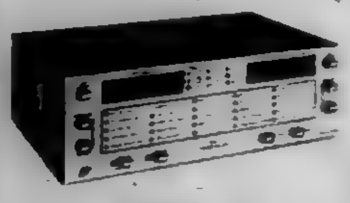
The TP-270 provides a simple, easy-to-use method of determining network response time and the individual delays that contribute to response time. The device also provides a means of directly measuring the effects of software or hardware changes on the network performance.



FEATURES
- Saves money by preventing network overkill while ensuring performance standards are met
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- Saves space by using high compression format
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- Archived data may be kept on disk or tape
- Comments, version tracking, and more

VMTAPE
- Provides accountability and security for VM tape volumes
- Provides flexible control by managing any number of tape volume series and tape drives
- Supports SL tape usage
- Eliminates operator tasks other than the physical volume mount
- Optional interface to OS/VS systems

VMLIB
- VM Library Control System allowing users to share source code without duplication
- Allows synchronization of source and object code
- Interface to DOS and OS systems
- Provides control and security by user, by program, and by function

VMSECURE
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- Simple end user command language
- Allows user to administer security

VMDEFER
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Handles Vsam, Isam Records

CICS File Utility Announced

FAIR GROVE, Mo. — MacKinney Systems has announced CICS On Line File Utility, a product that reportedly allows programmers to look up any record of any Isam or Vsam file that is defined to IBM's CICS.

The record displayed in character and hexadecimal form may be updated or deleted, a vendor spokesman said. New records may be added and files may be browsed forward or (Vsam only) backward.

The package will also scan a file searching for a record that matches a user-entered value. Security checks may be customized at installation to limit access to certain files.

The package is designed for checking test results, creating test input, correcting errors on files and troubleshooting, the spokesman said. The utility runs on any IBM or plug-compatible system supporting CICS and costs $695 or $295/year. The company can be contacted at Rt. 2, Box 270A, Fair Grove, Mo. 65648.

Interface Links SPSS System With VAX-11

MARLBORO, Mass. — Digital Equipment Corp. and SPSS, Inc. have announced a software interface that links SPSS' Statistical Package for the Social Sciences (SPSS) Batch System with DEC's VAX-11 Datatrieve high-level data manipulation facility.

The SPSS Batch System is a tool for information analysis, summarization and display that is said to offer more than 40 procedures from simple table construction to multivariate statistical analysis. Datatrieve allows password protection for SPSS data files, a DEC spokesman said.

SPSS/VAX users can pass data through the interface from the VAX-11 DBMS data base management system or from VAX-11 record management system (RMS) record files to SPSS, SPSS Graphics and the SPSS Conversational Statistical System (SCSS).

SPSS can also pass descriptions of VAX-11 DBMS and RMS data, stored in the VAX-11 Common Data Dictionary, to SCSS and SPSS graphics, the spokesman said.

The interface costs $4,000 directly from SPSS, 444 N. Michigan Ave., Chicago, Ill. 60611.

Version 5.0 Of 'Libxref' Out

WEST HARTFORD, Conn. — Multitask, Inc. has announced the release of Version 5.0 of Libxref, its cross-reference and documentation package for IBM and plug-compatible mainframes.

Version 5 of Libxref reportedly includes features that supplement data dictionaries by populating them automatically. Libxref can be used without a data dictionary to show automatically where all components in a system are used and referenced. This includes Cobol, JCL, PL/I and IBM IMS items.

The vendor also noted that the price of Libxref has been reduced. The product now is available on a permanent lease with full support for $1,999. Multitask is located at 1007 Farmington Ave., West Hartford, Conn. 06107.

T/S Offering Targets Banks

GREENWICH, Conn. — Control Data Corp. has announced the availability of a short-term money market function on its Business Information Services time-sharing system.

X/Issue is oriented toward financial institutions and corporations that issue certificates of deposit or commercial paper, a spokesman said. The offering can be geared toward each firm's requirements and can handle new instrument types, including periodic payment notes and variable rate notes. It provides for inputting, calculation, printing, revaluation, prepaying, voiding and tracking of a note portfolio.

Costs vary depending upon CPU usage, storage requirements and output with a minimum monthly charge of $200, a spokesman said from 500 W. Putnam Ave., Greenwich, Conn. 06830.

Eclipse Users Get Basic Compiler

BOWLING GREEN, Ohio — Dacor Computer Systems has introduced Ebasic, an interactive compiler for Data General Corp.'s Extended Basic running on Eclipse computers under AOS and AOS/VS.

The package is said to generate compact code that is fully compatible with Extended Basic programs already in use as well as with Cobol, PL/I and Fortran file formats. The compiler modifies, compiles and runs the program under development and checks for syntax errors. The run-time support module allows applications to be designed so that a user logs directly into an application program without using the compiler.

Ebasic incorporates five interchangeable numeric data types including two- and four-work floating point values and one-, two- and three-word integer values. Structured programming constructs include "if . . . then," "while . . . endwhile" and "if . . . do . . . else . . . endif" and supports full Boolean expressions in all forms of "if" and "while" statements.

A screen editor permits interactive definition of a screen using the terminal as a layout sheet together with a screen compiler. An Isam file access method provides support for duplicate and generic keys together with utilities to create, reorganize and access indexed files.

Ebasic costs $6,400 through P.O. Box 366, 13330 Bishop Road, Bowling Green, Ohio.

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Micro Notes

Overbeek Enterprises has announced a full-screen text editor called **Disk Inspector**. Although it runs on a Zilog, Inc. Z80-based microprocessor under Digital Research, Inc.'s CP/M operating system, users can inspect, alter, recover and read Apple Computer, Inc. Apple diskettes as well. It costs $29.95 from the vendor through P.O. Box 726, Elgin, Ill. 60120.

Data Associates has unveiled **Compare/C32**, a utility that compares different versions of Basic programs on disks for personal computers and provides a paged printout of differences. It runs on Radio Shack TRS-80 Model I and III microcomputers. Compare/C32 costs $24.95, including operating manual, and is guaranteed to load and run. More information is available from the vendor through P.O. Box 882, Framingham, Mass. 01701.

Residential Energy Analysis announced **On-Line Plotting Utility System (Opus)**, an Apple Computer, Inc. Apple II package said to emulate Tektronix, Inc. remote graphics terminals. Opus was designed to execute on a 48K-byte Apple II or Apple II Plus with at least one disk drive and a Hayes Microcomputer Products, Inc. Micromodem II. The system costs $200 from the vendor at 864 Eisenhower Drive, Pittsburgh, Pa. 15228.

Microsoft, Inc. has announced the release of the **Business Basic Compiler** for Intel Corp.'s 16-bit 8086 and 8088 microprocessors running under the MS-DOS operating system. It costs $600 from Microsoft at 10700 Northrup St., Bellevue, Wash. 98004.

RR Software has announced the release of a new version of its **Janus/Ada compiler** said to be a scaled-down demonstration version designed to exemplify the features of the full Janus/Ada package. It is available for disk formats such as Digital Research, Inc.'s 8-in. CP/M-80 and CP/M-86, IBM's Personal Computer PC-DOS and PC-CP/M-86, Apple Computer, Inc.'s Apple II Softcard and MD-DOS. The demonstration version costs $30 from RR Software, P.O. Box 1512, Madison, Wis. 53701.

PC Goodie Co. has introduced the **Label Kit PC Disk Organizer** for the IBM Personal Computer. It prints alphabetized labels which are placed on a disk and works with any tractor-feed or letter-quality printer such as those from IBM, Qume Corp., NEC Corp. and Epson America, Inc. It is available for $59.95 plus shipping and handling from the vendor at Suite 10, 15445 Ventura Blvd., Sherman Oaks, Calif. 91413.

Solid Software, Inc. has announced an enhanced version of its **Commercial Property Management** package for users of Digital Research, Inc.'s CP/M and Microsoft, Inc.'s MS-DOS operating systems. Designed for use by landlords and property managers who own multiple properties, the package costs $1,495. The vendor is located at Suite 501, 5500 Interstate N. Pkwy., Atlanta, Ga. 30328.

A Visicorp Visicalc expansion package for Apple Computer, Inc. Apple II users is available from U-Microcomputers, Inc.

The **Visicalc Expand Gold Pack (VEGP)** reportedly expands the Apple II's display from 40 col. by 24 lines to 80 col. by 24 lines and its memory from 35K bytes to 145K bytes. The 80-col. card in VEGP is said to be fully compatible with IBM DOS 3.3, Digital Research, Inc. CP/M and UCSD Pascal.

VEGP with 128K bytes costs $720 from the vendor at 300 Broad St., Stamford, Conn. 06901.

Science Management Corp. (SMC) has announced its **Multiuser Basic Operating System (M-BOS)**, for 16-bit microcomputers by Seiko Instrument, U.S.A., Inc., Dynabyte, Inc. and Micro-Five Corp. M-BOS includes the company's Basic programming language and is compatible with SMC Uni-Dol, a version of Bell Laboratories' Unix System III. The package supports up to 16 users and is compatible with SMC's Idol data base management system, a spokeswoman said. The price range is from $395 to $795 through P.O. Box 6800, 1011 Rt. 22, Bridgewater, N.J. 08807.

Three programs for use with the Profile Plus electronic filing program for the TRS-80 Model II microcomputer were introduced by Radio Shack. **Profile Prosort**, available for $149, was described by the vendor as a high-speed indexing program that permits sorting and selecting records from any segment of a file. **Profile Forms**, a print program that prints one report per sheet on each item in the file, is priced at $125. **Profile Archive**, which allows the user to purge inactive records from any file in Profile Plus, is available for $49. The vendor is located at 1800 One Tandy Center, Fort Worth, Texas 76102.

Gemini Information Systems, Inc. has announced a data base management system for the IBM Personal Computer. The price of **DDQuery** starts at $7,500 from the firm at 5500 S. Syracuse Circle, Englewood, Colo. 80111.

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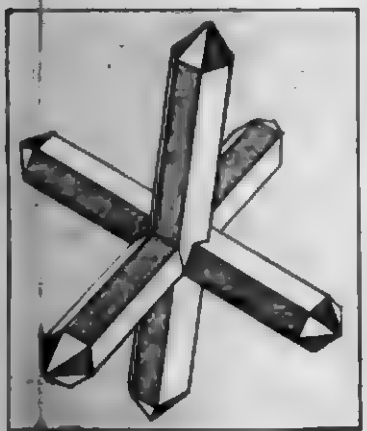

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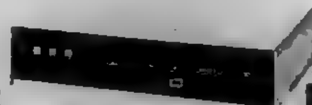

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DataLynx/3780: a comprehensive batch emulator for remote or host simulation. The DataLynx/3780 can connect async terminals or minicomputers to an IBM bisync host, or an async minicomputer to an IBM bisync peripheral such as the OS6 or 6670 laser printer. Price $1750

DataLynx/3270: an interactive 3276-2 bisync emulator that supports two async ports configurable as two CRTs or a CRT and printer. The DataLynx/3270 allows dumb CRTs to emulate the IBM 3278-2 CRT. The CRTs may be connected via *dial-up async* modems, giving dial capability to a 3270 network. Price $1450

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From Five Case Studies

Report Reveals Solutions to Net Problems

By Bruce Hoard
CW Staff

FRAMINGHAM, Mass. — A recent report from International Data Corp. (IDC) titled "Case Studies in Network Implementation" reveals how five large corporations solved their communications networking problems.

Midland Oil and Gas Corp. formed the Committee for Office Planning and Review (Copar) in 1979 after it realized the potential for substantial productivity gains through office automation, the report noted. The committee had representatives from corporate headquarters as well as major divisions.

Copar clamped a nine-month embargo on office automation purchases, developed a statement of corporate policy covering the acquisition and retention of equipment and set a corporate goal of compatible and integrated sets of office automation equipment and systems, with an eye toward developing a corporatewide communications network.

After thorough investigation, Midland selected Xerox Corp.'s Ethernet for its corporate networking scheme. Midland felt Ethernet had distinct advantages as a networking scheme and that Xerox was committed to the kind of enhanced information handling functionality it would need for future applications.

The U.S. House of Representatives' Committee on House Administration is currently implementing a broadband local-area network to support data and voice traffic of the House of Representatives Network, the IDC study said.

"House Information Systems began installation of the cable systems almost three years ago and this effort is still underway," it stated, adding, "The cable runs throughout six buildings located in approximately a one-mile radius on Capitol Hill."

The House is presently reaching the completion of Version IA of its three-phase implementation procedure. Version IA has a local-area network in operation to which are connected the House's Amdahl

(Continued on Page 42)

Graphics Terminal 4010-Compatible

GVT Graphics Display Terminal

PHILADELPHIA — Human Designed Systems, Inc. has introduced an interactive graphics display terminal said to be compatible with the Tektronix, Inc. 4010 graphics terminal.

The GVT Graphics Display Terminal offers vector and character erasure or write-over, block fill, memory dump and load, dotted and dashed lines and graphics memory dim. The terminal combines Ansi X3.64 functionality, Digital Equipment Corp. software compatibility and switchable 80/132 col. capability, a vendor spokesman said.

The terminal is available with eight pages of memory for $2,045 and with four pages for $1,895 from 3440 Market St., Philadelphia, Pa. 19104.

Communications Products Series Announced by Tri-Data Corp.

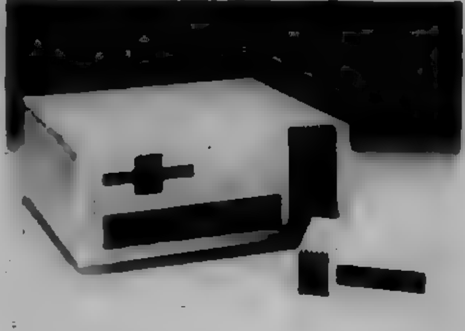
MOUNTAIN VIEW, Calif. — Tri-Data Corp. has introduced a family of communications products that can be configured as a multiplexer, data concentrator, protocol converter, cluster controller, packet processor and nodal processor.

The products reportedly allow dissimilar hosts and workstations to work in the same network regardless of the local or remote protocols employed. Any RS-232/RS-422-compatible workstation devices are supported, including personal computers and teleprinters, a vendor spokesman claimed.

The Netway 200 communications processor provides remote and local networking facilities for up to 32 workstations and/or host ports. The Netway 50 local network interface connects a local network to a Netway 200 processor up to two miles away.

The Netway 100 device interface processor provides terminal emulation and presentation services and is down-line loaded from the processor. The Netway 150 is a network interface processor that acts as a remote connection for a local network.

The communications operating system, Ncos, provides workstation and host transparency and allows multiple host protocols to run concurrently. An interface allows Digital Research, Inc.'s CP/M operating system to run as a task for application development. The Nnet networking software is said to provide automatic alternate routing, on-line configuration from any workstation and network mangement with up to 254 Model 200 processors.



Netway Links Dissimilar Devices

The series of products together provide such protocols as Ascii start/stop, IBM 3270 Binary Synchronous Communications, IBM 3270 Synchronous Data Link Control (SDLC), IBM Systems Network Architecture/SDLC, Burroughs Corp. Poll/Select and X.25, according to the vendor.

The communications processor is available for $6,880, the local network interface for $200, the device interface processor for $420, the network interface processor for $420 and Nnet for a single-user license fee of $500.

Shipments will begin in the second quarter of 1983 from Tri-Data, which is located at 505 E. Middlefield Road, Mountain View, Calif. 94043.

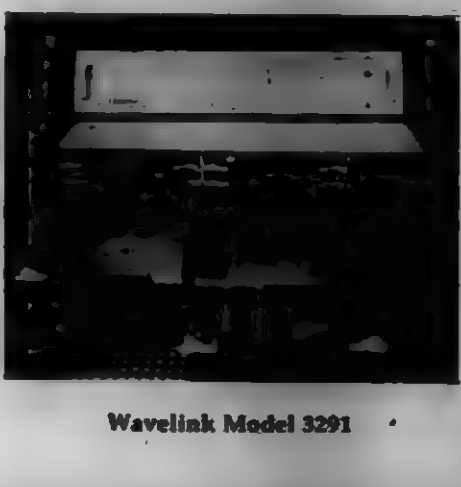
Broadband Optic System Bows

GRASS VALLEY, Calif. — The Grass Valley Group, Inc. has introduced a broadband fiber-optic communications system said to handle single channels of data and video information.

Wavelink Model 3291 transmits analog signals over a distance of 2 kilometers using an LED source and an FM transmission method rather than AM. The FM method operates with an on/off action of the transmitting device.

The systems can transmit a single channel of data between 20K bit/sec and 50K bit/sec depending on the proximity of the terminal to the system, a vendor spokesman said.

Wavelink's transmitter and receiver are available for $11,000 each from The Grass Valley Group, Inc., which can be reached through P.O. Box 1114, Grass Valley, Calif. 95945.



Wavelink Model 3291

Terminal Manager Out for VAX-11

MAYNARD, Mass. — Digital Equipment Corp. has introduced terminal data management software said to reduce development and maintenance costs for interactive applications that use screen-displayed forms to guide data entry and inquiry.

The VAX-11 Terminal Data Management System replaces portions of the application programs with program-independent definitions for screen formats and application program/data mapping, a vendor spokesman said.

The software is intended for DEC VAX computer systems running interactive, terminal-based applications ranging from data base inquiry/response/update tasks to real-time uses such as monitoring the output of an industrial process.

The package will be available in April for a single-use license fee of $5,000 from DEC, which is located at146 Main St., Maynard, Mass. 01754.

Interface Links TI Micro to Net

SAN JOSE, Calif. — Corvus Systems, Inc. has introduced an interface said to allow the newly introduced Texas Instruments, Inc. Professional Computer to connect to a Corvus Omninet local-area network.

The transporter card interface will allow users to share peripherals such as mass storage devices and printers and will offer interactive communications and connections to as many as 63 other microcomputers or peripheral devices, a vendor spokesman claimed. Omninet is a carrier-sense multiple-access local-area network.

The interface is available for $495 from Corvus Systems, Inc., 2029 O'Toole Ave., San Jose, Calif. 95131.

Report Reveals How Firms Solved Network Problems

(Continued from Page 41)

Corp. computers and 31 asynchronous terminals. Over 150 users are expected to be on-line within a year.

Last year, M/A-Com, Inc. installed a $500,000 proprietary satellite communications system that is expected to provide the company with an effective management tool for the coordination of engineering, manufacturing, financial systems, marketing and research and development among the various M/A-Com operating companies.

The Macomnet system will be used for video teleconferencing, voice communications, distributed data processing (DDP), electronic mail and document distribution. At present in phase one, the network allows asynchronous communications for 30 user devices. Phase Two is expected to see that figure rise to 200.

Champion International Corp. is a Fortune 100 forest products firm, which, according to the IDC study, has implemented "a more or less straightforward [DDP] star network."

The network allows Champion to centralize corporate accounting, financial and reporting processes while giving remote sites the computational power to process orders and invoices while keeping tabs on shipping and inventory.

The IBM 3033- and 3031-based system employs an NCR Comten, Inc. 3690 data switching system with a disk as a "large mailbox" for communications between the mainframes and 160 IBM Series/1s located at remote sites.

"Rather than let the structure of the distributed processing network dictate management structure, Champion has instead attempted to integrate the processing functions into the organization," the report observed.

In so doing, it added field support services to the management information systems group. The end result was that the field service group is now able to maintain control of most of the distributed network.

Fireman's Fund Insurance Co. has three IBM 3081 mainframes and a large Systems Network Architecture network of 8100s to support over 50 branch offices and 15,000 independent insurance agents.

Fireman's Fund's migration to DDP followed what the report termed "a relatively typical" path. Starting from a highly centralized DP environment, the company installed terminals followed by minicomputers at its branch offices.

Despite some difficulties, the firm is happy with its 8100s and is planning to install about eight more each month, the 51-page report said.

"Case Studies in Network Implementation" is available for $4,500 from IDC at Five Speen St., Framingham, Mass. 01701.

With Cursor-Addressing Protocols

Displayphone Enhanced

MINNEAPOLIS — Northern Telecom, Inc. has added a feature enhancement to its Displayphone integrated voice and data terminal.

The Displayphone will now include two user-selectable cursor addressing protocols, according to a spokesman for the vendor.

This is said to allow the product to access more sophisticated computer programs. It will also allow the terminal to be partially compatible with the IBM 3101 terminal, the spokesman said.

The enhancement is incorporated into the terminal's software, according to the spokesman.

Displayphone sells for $1,595 from Northern Telecom, Inc., Data Park, P.O. Box 1222, Minneapolis, Minn. 55440.

Datec Modems Get $200 Price Cuts

CHAPEL HILL, N.C. — Datec, Inc. has announced a $200 price reduction on two of its top-of-the-line Bell Laboratories 212A-compatible modems, effective March 1.

The new price of the Datec 212 is $595, which includes features such as built-in "A" control, seven diagnostic tests and front-panel voice/data control. Datec's 212 modem with automatic calling unit is now priced at $695 from Suite 116, 200 Eastowne Drive, Chapel Hill, N.C. 27514.

Message Switching Unveiled

ST. LOUIS — McDonnell Douglas Automation Co. has introduced a rapid message switching package that integrates applications that run under IBM's IMS DB/DC data base management software.

The Message Distribution and Collection System (MDCS) provides terminal-to-terminal communications and communication between terminals and on-line or batch-oriented application programs. It reportedly supports IBM 3270 or 3270-compatible terminals.

An MDCS user can inquire from an on-line terminal about the quantity and type of messages waiting to be received. The user can then route the messages to any video terminal or printer included in the communications network, according to a spokesman for the vendor.

The package is available for $28,000 from McDonnell Douglas Automation, P.O. Box 516, St. Louis, Mo. 63166.

ACC Emulator Fits Ethernet Line

SOQUEL, Calif. — Associated Computer Consultants (ACC) has announced an emulator that reportedly will allow customers to begin development of Xerox Corp. Ethernet hardware and software for use with Advanced Micro Devices, Inc.'s (AMD) AM7990 family of Ethernet integrated circuits due to be released in 1983.

The emulator will allow users to plug into sockets on any development board designed to receive the AMD integrated circuits. The circuits will include the AM7990 single-chip very large-scale integration local-area network controller for Ethernet and the AM7991 serial interface adapter, which performs Manchester coding/decoding and provides an interface to the transceiver cable, an ACC spokesman said.

The emulator will be available in October for $2,800, the spokesman said from 2901 Park Ave., Soquel, Calif. 95703.

For IBM 4300 Series

Hydra-II Controller Out

MISSION VIEJO, Calif. — JDS Microprocessing Associates has announced the Hydra-II controller for IBM 4300 series processors.

The unit allows users of IBM 4300 series and compatible processors to attach any device using an RS-232 port directly to their processors. The vendor said the Hydra-II is a self-contained unit and does not require a separate controller for attachment.

The unit costs $6,900 for an eight-port system and $9,900 for a 16-port system. Multiplexer channel cables are included in the purchase price. RS-232 cable costs 50 cent/ft, the vendor said from 24871 Pylos Way, Mission Viejo, Calif. 92691.

Naked Mini Gets Packages

IRVINE, Calif. — Computer Automation, Inc. has introduced two communications packages for its Maxi bus- and Scout bus-based Naked Mini minicomputer system.

The Local Area Support Subsystem is an RS-449-based system said to permit interaction between several primary and secondary computer systems in a local area. The Telecommunications Applications Support Subsystem is an RS-232C-based product that features applications support involving public (switched) or dedicated (leased) communications lines, the vendor said.

A typical subsystem is priced at $1,425, available from Computer Automation, 18651 Von Karman, Irvine, Calif. 92713.

Visual Tech Extends Graphics Terminals

TEWKSBURY, Mass. — Visual Technology, Inc. has announced several enhancements to its Visual 500 and 550 graphics terminals, which are aimed at laboratories and scientific and business markets.

The terminals emulate both the Tektronix, Inc. 4014 and 4010. Advanced graphics enhancements are said to include circle and arc draw, resident vector draw, point plot, rectangle draw, multiple line styles and patterns with rectangle pattern fill.

The alphanumeric capability of the 550 is now Digital Equipment Corp. VT100/VT52 protocol-compatible, as well as being a buffered editing, block-mode terminal complying with the Ansi X3.64 standard.

The 500 costs $2,495, and the 550 costs $2,695 from 540 Main St., Tewksbury, Mass. 01876.

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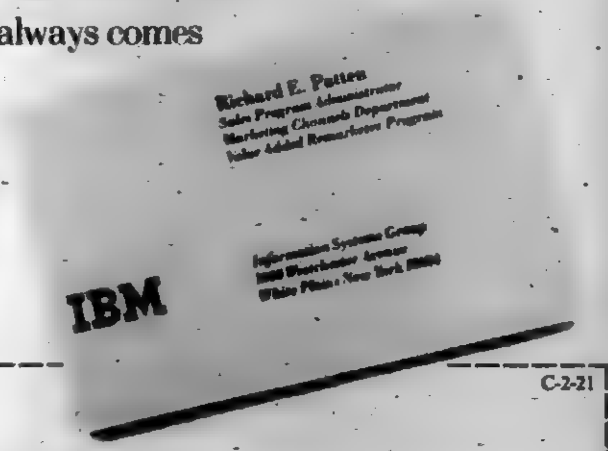
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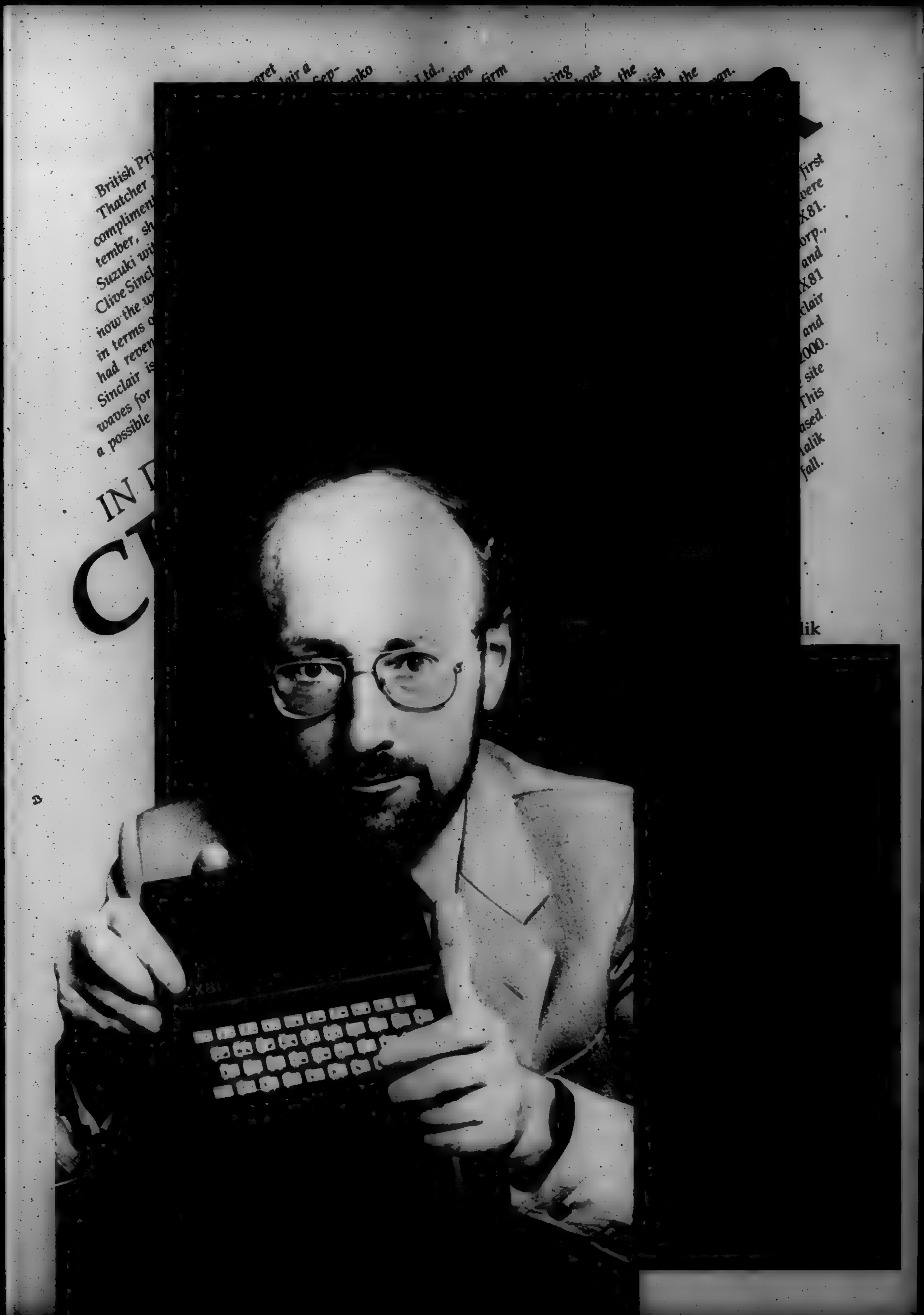
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project, which was really an attempt to get costs down. It was not going to be our main business, but it has turned out to be bigger than we thought — today, personal computers are the main part of our business.

I have really always been in the consumer electronics business. That business has always tended to change. First there were hi-fis, then calculators, then TVs. And now there are computers. Computers are very different from these other consumer electronics products: They represent a much more long-term business.

In a way then, you are locked in a fashion that you were not with the previous technologies in which you worked. Given the continuation of some sort of recognizable economic climate, you will have to be there 20 years from now.

That's right. Luckily, we cannot foresee the day when a computer becomes just a standard box. There will be box-standard machines along the road, but we do not simply have to make those. There will always be something fresh waiting to be done.

What comes next?

The microcomputer evolves into a product that is really useful in the home. When that comes about, the user may cease to think of it as a computer, but that is still what it will be.

Is there a future for the microcomputer as a communications device? Most videotex terminals are singularly dumb. By contrast, the Austrians have gone a different route: They have based their videotex terminals around microcomputers, making them intelligent.

We are developing a videotex adaptor for our computers to provide just that. Initially, it is going to be a British standard. The American problem is, I am afraid, much more complicated.

How is the American market otherwise?

It is doing very well. We have been operating in the American market now for two years and are operating through others, primarily by mail order.

What is happening to the market in general? Is there an evolution taking place in which Sinclair products appear along with everybody else's, or does the next serious step come first from Sinclair?

I think we are all going in the same direction, but I think Sinclair will be the leader. I think that the next stage, both for us and for others, is to put microfloppies into domestic products. They have not been there in the past because of price. But putting them in, I think, makes a big difference. With bulk storage and bigger memories, we can handle these disks, which means that we can come up with much more powerful machines.

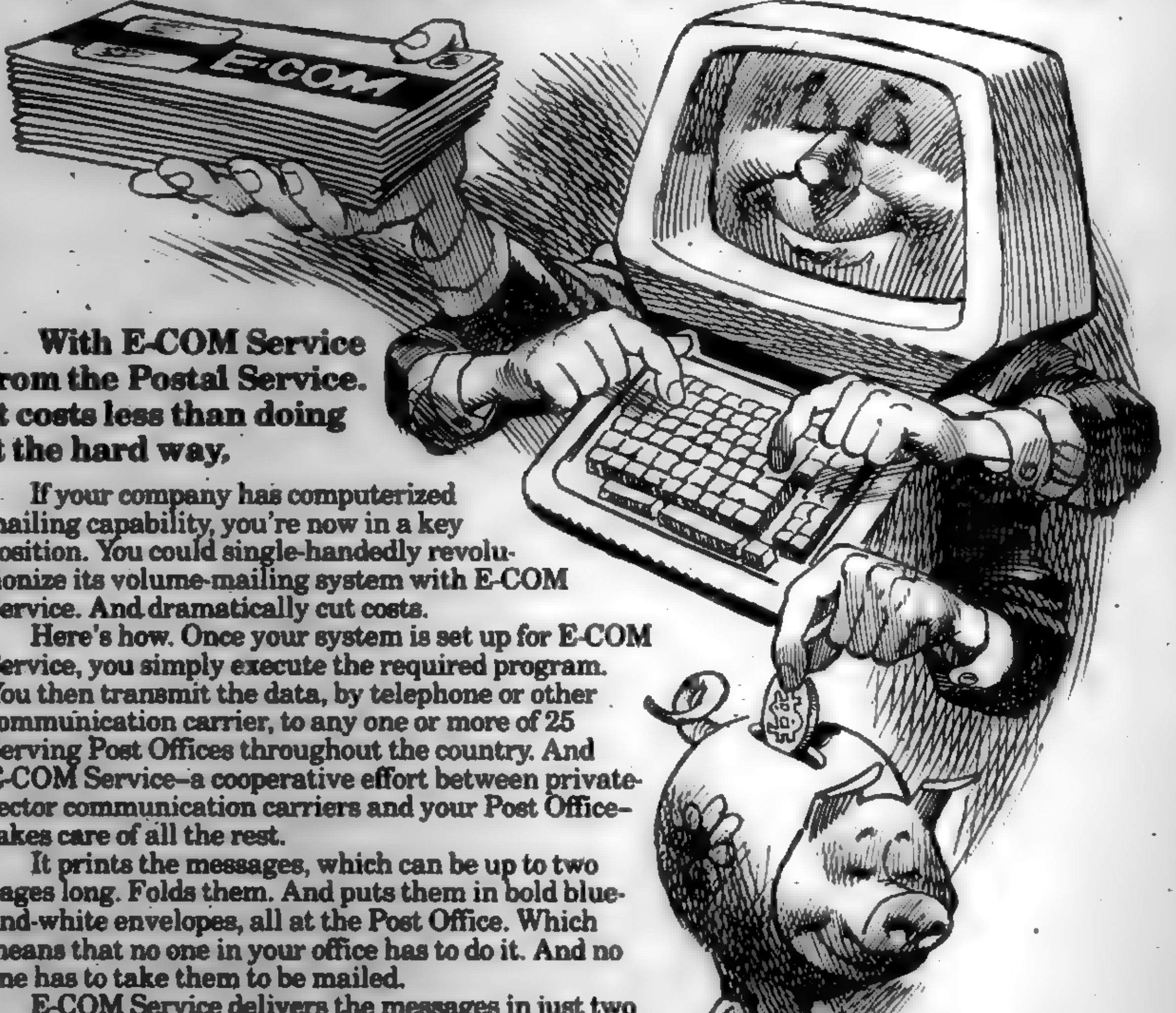
Now exactly what we do with those, I don't know yet. It is going to take an awful lot of imagination to come up with the software that uses these facilities.

I grant that people have gotten used to turntables over the last 40 to 50 years. But now there is a need for technology to operate in the home way beyond the tolerance of the hi-fi market. Don't we have here a problem in search of a long-term solution? Aren't we really waiting for nonvolatile very large-scale integration [VLSI] memory?

It looked as if bubble memory would fill this gap, but it does not seem to have lived up to its promise. I do not know why. Most prices quoted for it are out of the realm of possibility for our business.

I agree with you that we would greatly prefer a solid-state solution: It is far more elegant. I do not think that reliability will be a problem, because the sort of engineering tolerance we are talking about is used in domestic products, with videotape recorders, so it's within the reach of our technology.

One looks at the size differences of disks and VLSI, and one cannot



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help thinking, "There has to be a better hole than this."

Large silicon memories will do the job as well. I believe that silicon disks will come along.

Yet we are still in the early stages of microcomputing in the home. What sort of bells and whistles are required to make these systems do things that people really need?

We are taking steps to make these machines more powerful, and this enables us to do more or less what we want. And we are hooking on to power links to the telephone and links to printers, so that users will be able to do some word processing.

Will improvement in voice technology, both input and output, be helpful? Are you working in this area?

We are not doing any such work at the moment. I am not too optimistic.

Why?

Because it is such a complex problem. It is very easy to make a machine recognize 20 words spoken by one individual. But it is an exponential problem: As soon as you get to the point of wanting, say, a thousand words to be understood, the problem is greater.

And if you want those thousand words to be understood with many speakers, it is an even greater problem. In order to do that, we need a new generation of machines, a new type of machine entirely — for example, an enormously parallel machine. And although such machines are in the research stage, they are a long way from the domestic market.

That does not mean to say that we are not watching voice technology and waiting for that day. But we are certainly not taking our existing computers and trying to make them do that job, because they are not able to do it.

So this is really a problem of 10 years out.

That's the sort of order.

Then we are talking of the time scale of Japan's fifth generation, which leads me to this: Do you think you can really compete with the Japanese over the long haul? So far you have been very lucky . . .

That is not being very lucky: That is what we do all the time. That's our business. We have spotted needs before the Japanese time and time again: the calculator business, the digital watch business, the computer business.

And time and again in the past, the Japanese have come in and benefited from that. In the computer business, some of that same thing will happen. But we have the advantage this time: We have deliberately established a volume of scale before they get there.

But to get back to your point, which I think is a very important one: As we move toward the fifth generation, it becomes more and more a problem of advanced silicon technology. I am concerned that this may not be available to us in Britain; it may only be available in Japan or possibly in the U.S. America is waking up, but it's closing its doors to the outside world in this field.

You are producing over two million units a year. What would you expect the numbers to be like in two to three years?

Let's first put those numbers in perspective. The color television market in Britain is something over 2½ million units a year. There's no reason why the computer market should not become a similar size in due course.

When you start talking in these numbers, the software becomes even more critical. Software has to become an automated-production consumer product, but it certainly does not look like that now. What do you do to give people new facilities?

In a few words, I do not know.

We are very concerned with that problem and looking at it at the moment. We do not have all the answers

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yet. We are using the best facilities available. ICL [International Computers Ltd.], for example, is writing software for us.

We are beginning to look at advanced software generation tools, but that is not really going to yield any results for a long time to come.

We are concerned with what languages we should be using. People in the organization are very much inclined toward Prolog, for example.

It seems that if you talk in the volumes you mention, all the languages we have are unsatisfactory. Would you agree?

Yes, I do. They are so laborious. They are not redundant. You have to write perfect code, and that is something we have to get away from.

If I write you a letter, I do not have to be absolutely precise and you still understand my meaning. If I leave a word out, you understand it. There is redundancy in the sentence structure.

I think we have to get to the point where we can program computers in that way as well.

> *'In 10 years, when we start to see fifth-generation machines, we will face a situation that one can only describe as extraordinary. We will face machines that can be described as truly intelligent.'*

What I have always wanted to see is a tool to be used when writing your own code that tells you if you are doing it wrong.

Prolog is a bit like that; it is the first step in that direction. But I want to approach it another way. Not so much that it tells you when you are wrong, but it tells you whether it understands.

How do you produce something like this?

You do it interactively with the computer. To take an extreme case, you can tell the computer what you want to do in normal English. And I do not think that we are that remote from this.

If it did not understand you, it would interrogate you in normal English. It would say, "What do you mean by so and so? Expand the point you have just made. Did the word such and such mean this or that?"

It is an interrogator. You would work with the machine in exactly the same way you would work with an employee.

That is the route we see it going, and we see Prolog as a step on that road. We are implementing Prolog on the Spectrum for that reason. That should be out soon, and we shall also have Logo.

There's a good Logo community already in existence in the U.S., though there is not one in Britain. Will it be aimed at the U.S. community?

It will be aimed at education generally. Although, as you say, there is no community in Britain yet, there is not anything else available to preclude it, so it could grow up as computing in education expands.

Initially, we are giving it away free to schools to encourage its use. We will put it out as a cassette, and then we will put it on the market.

Looking five years ahead and considering the large volumes you foresee, we are likely to have many incompatible microcomputers on the market. Or are we? Is it possible that we might see the same situation that we have in mainframes — if not a dominant manufacturer, certainly a large volume of compatible systems on the market? Have you thought about this?

Yes, very much. There are two ways of approaching a situation in which we have compatible systems. One is to try to form committees of the principal producers to agree on a standard. The other is for a company to go out and establish so strong a position that everybody comes along behind it — the IBM approach.

It is the latter that I think will happen in the micro world, because everyone does not seem to be working together. There are several people who look as if they might establish a standard.

IBM might, but it is not looking very likely at the moment. We might, and that is looking far more likely. We alone in the microcomputer business have licensed large companies to take our technology — alone because only we have a strong enough technology to justify the payments that will be involved.

The license agreements we have are not just for hardware: They are also for software. For example, Timex Corp. is committed to Sinclair Basic and so is ICL. Those commitments at this stage do not make a lot of difference, but will as we move on. If you look at the market now, all the people making peripherals for the consumer side of the personal computer business are making them for our machines.

And the stronger we get — the more machines we get out — the more that is the case. If new people want to enter the business, if they want to enter it at all, they're going to have to make their machines compatible with those peripherals.

And in doing that, they will make their machines compatible with our machines. So, it's a de facto standard.

What are the likely impacts of computing on society in a five- to 10-year time frame?

I think that five years is not going to be too dramatic. But in 10 years, when we start to see fifth-generation machines, we will face a situation that one can only describe as extraordinary. We will face machines that can be described as truly intelligent.

How will we feel the effects of those? What will be the impact on employment, for instance?

I think the computer is a source of jobs. It is really the lack of demand that causes the recession, the unemployment.

And there is a lack of demand because people's perceived needs have been filled. That is not to say that all their needs have been filled, just that many of those they perceive have been. They don't feel a burning urge to work harder for a particular product.

The computer will generate new products that people will want.

What sort of new products?

Well, say a home robot. There is no reason why it should not do what any servant of the past did.

But that is some years away. What happens in the interim?

Long before that you have nonmobile intelligence. I think that the expert systems route is very exciting. The home doctor, the home medical aide — that's the sort of field that is attractive.

And what would be the reaction of the professional medicos?

Sheer horror, I should think.

But the storage requirements for systems like this are going to be immense, because they are going to have to carry very large data bases. There are then two routes you can go: one is the videotex route, in

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which you pull it all down from the center . . .

Oh no. It will have to be local, because if you are going to have to search through this vast file very rapidly, then it must be local.

You are looking then at home computers that turn out to have very large amounts of library storage. Disk storage?

In an expert system, I am not sure that it can be, because you have to search through all the memory.

So you have a standard file that is burnt in? Yet if one remembers that all the expert systems fields are changing and developing, how do you proceed to keep people up to date? You change the chip once a year? You sell somebody an update like you sell him an encyclopedia?

Yes, that's right. You could sell him an update over the telephone. It might be in nonvolatile memory, but nonetheless changeable.

But the structures to do something like this do not as yet exist.

Oh no, it is a massive new field.

So you get to a situation where the systems to which you are committed permeate society. How does society treat them? Do you see society moving in and saying, "Hey, these things have to be policed"? That's what we do with everything else.

I do not see how it can be avoided. I suppose that it is slow to happen in a rapidly changing field, and that is the one benefit. But eventually society does police almost everything.

What are the main stumbling blocks to the expansion of the market?

Our main stumbling block at the moment is in getting enough production. I think the market has grown so rapidly it has caught us unaware. The problem has been that the plans we made have been proven wrong.

Just you? Or you and everybody else?

Oh Lord yes, not just us. We anticipated a bigger market than anyone else, but even we were not large enough in our forecasts.

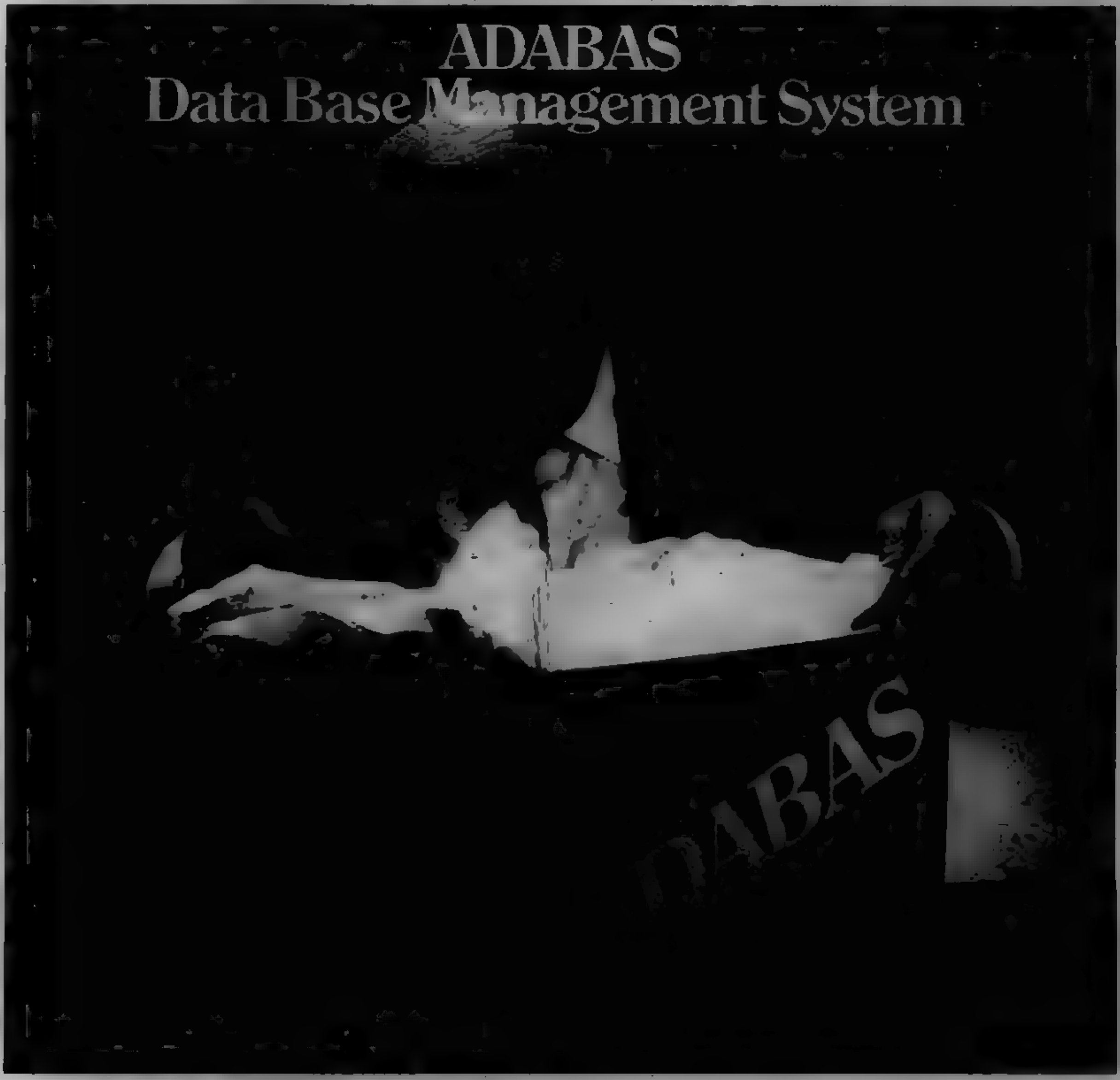
I cannot put numbers on it, but I can put it this way: When we brought out the Spectrum, we thought that the market could not be as large as the ZX81 market, if we didn't initially advertise it to the general public.

But it was, and that was unexpected.

We are seeing a demand from the general public for the Spectrum, which is contrary to our general expectations. We do not even know why they are buying it.

Obviously, we were expecting some demand. We can even see some reasons for people to buy our machines! But it has gone way beyond that.

The interviewer, Rex Malik, is a 25-year veteran of computer journalism and a consultant to the British Broadcasting Co. for its computer literacy series.



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The Psychology of DP

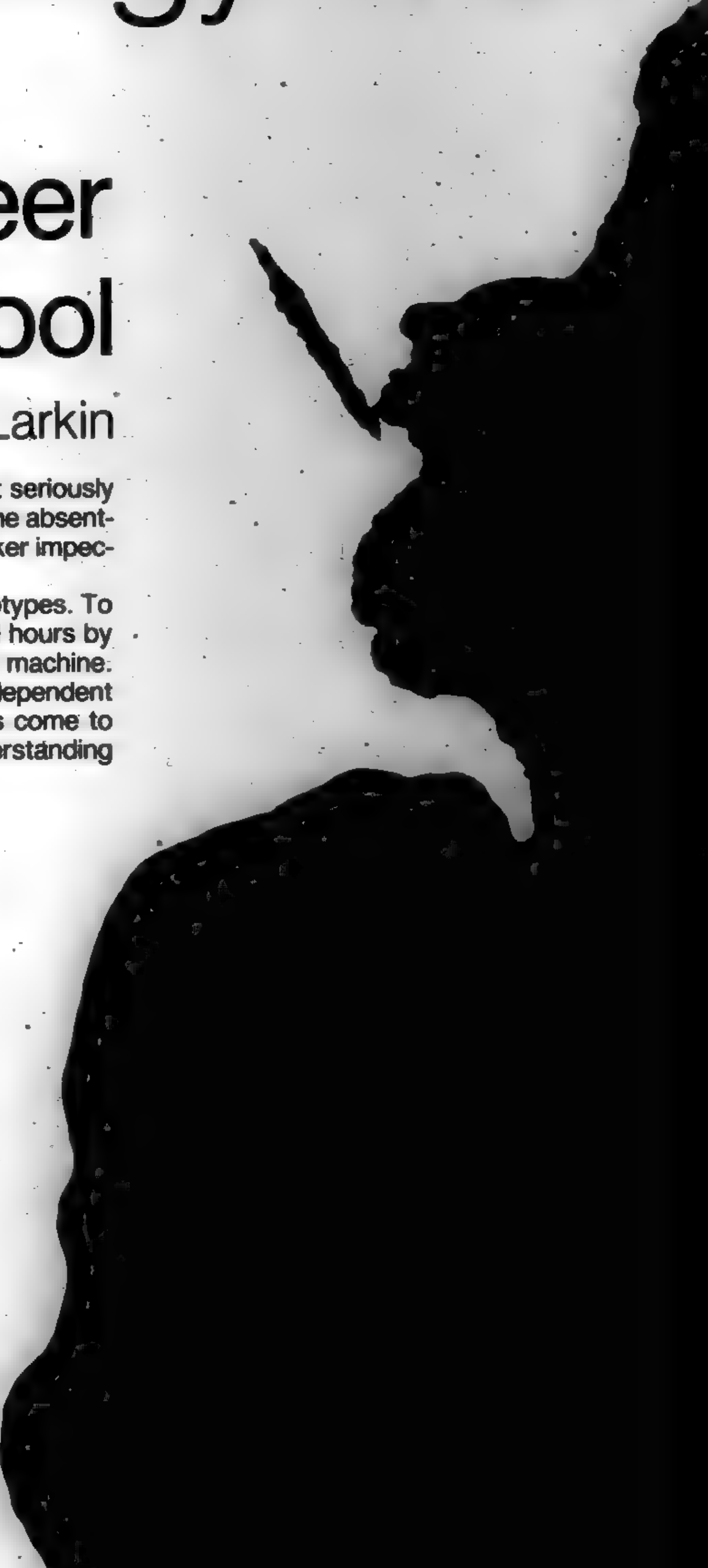
A Career Planning Tool

By Judith E. Larkin

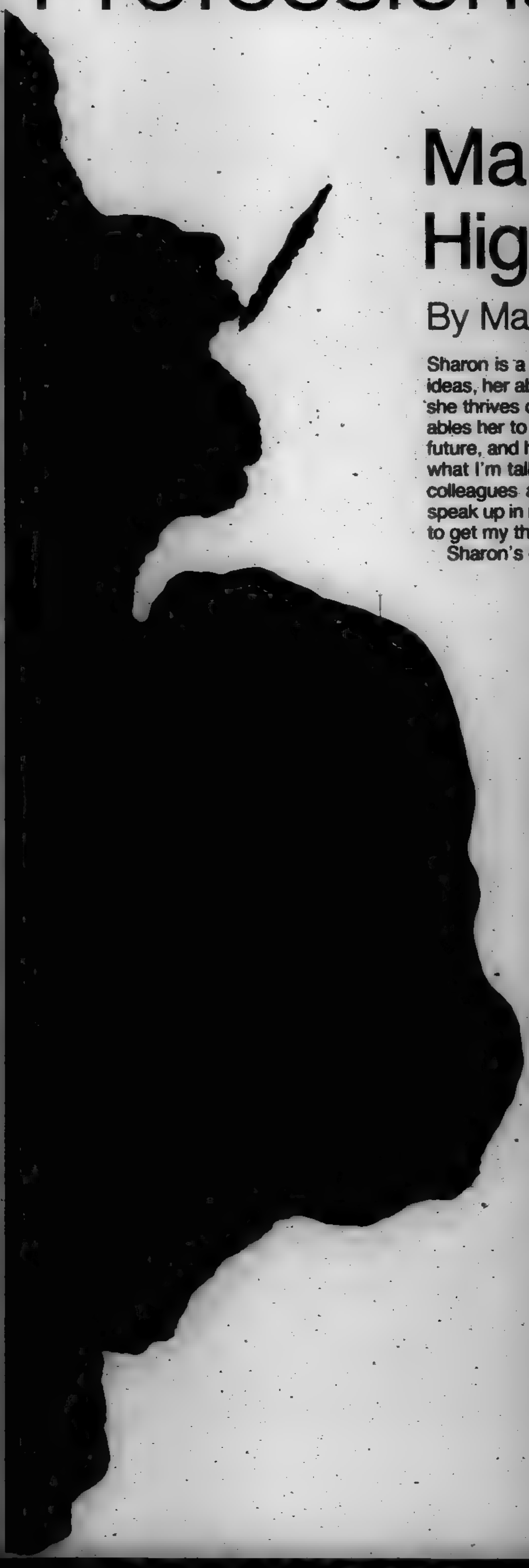
For every occupation there is a stereotype: the accountant seriously poring over columns of numbers, attentive to every detail; the absent-minded professor, bespectacled, in baggy clothes; the banker impeccably attired in a pin-striped suit.

Data processing people are not exempt from such stereotypes. To an outsider, they bear mysterious titles and seem to spend hours by themselves staring into a monitor, communicating with a machine. Are DP professionals really eccentric, unsociable, overly independent and unfazed by social conventions? Perhaps the time has come to put aside misleading generalizations and seek a better understanding

(Continued on In Depth/10)



Professionals: Two Views



Managing the High-Tech Creative

By Marsha Sinetar

Sharon is a bright systems analyst. She suspects that her inventive ideas, her absorption in work and her intensity threaten her boss. Yet she thrives on new ideas and methods and believes her intensity enables her to concentrate best. She feels her boss is undercutting her future, and her resentment is growing: "My boss doesn't understand what I'm talking about. He hates it when I propose new ideas. Even colleagues are reading his attitude and now seem irritated when I speak up in meetings. I'm not good at the little political games needed to get my thoughts across. I feel angry and stuck."

Sharon's creative personality is working — unsuccessfully — in a

(Continued on In Depth/14)

DISTRIBUTED PROCESSING NETWORKS

Another in a series of messages on advanced technologies from Honeywell Information Systems.

Many data processing professionals are being faced with demands for networks capable of moving increasing amounts of data among more and more locations. Up to now, application-dependent network structures—with their inherent risk of major conversions—offered the most readily available response. Honeywell's Distributed Systems Architecture (DSA), however, provides a more practical alternative. An application-independent networking structure, it fully supports public, value-added, private and international nets.

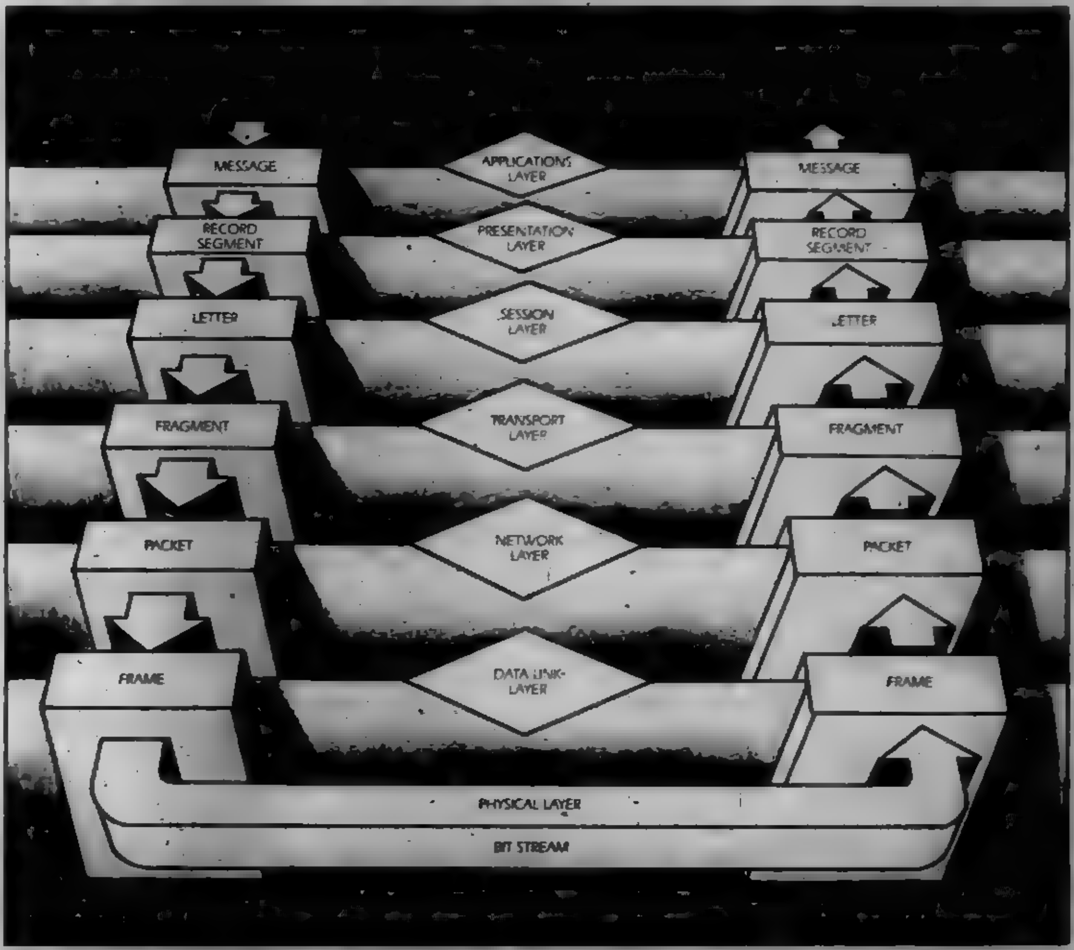
World-Class Networking Today
Honeywell's DSA establishes standards for data movement and application cooperation in compliance with the International Standards Organization's (ISO) open systems reference model. The architecture, which is not dependent on specific technology or techniques, keeps applications and communication processes separate. Thus DSA is transparent to the end user. DSA creates a cooperative, flexible environment within which the user can build and phase in a communications system that can handle current applications and grow to meet new domestic and international demands.

DSA Structure
DSA's flexible set of rules, protocols, and interfaces allows users to configure and implement data processing systems and networks to help meet the needs of geographically dispersed organizations. Introduced in 1980, DSA consists of a seven layer architecture divided into three groups. The implementation of the first four layers in the Communications Management group controls physical exchanges across the network. The next two layers, the Message Management group, format messages so that the communicating entities can understand each other. They also contain the dialog mechanism that permits communicating activities to synchronize their actions, and the presentation control services which provide application independence from data format, character codes, and terminal handling conventions. The seventh layer, Applications, defines the logical rules to which computer applications conform when communicating. Finally, each layer of DSA also provides network administration and control data to enable overall network control of the distributed system.

Network Support
Because DSA conforms to the ISO open systems model, it's certified as providing native support for the CCITT international X.25 packet-switched and X.21 circuit-switched network protocols. These protocols are being implemented in a growing list of public data networks around the world as well as in value-added and private networks. DSA products support such X.25 based networks as TELENET and TYMNET (United States), DATAPAC (Canada), DATEX-P (Germany, Austria), DDX-P (Japan), DN 1 (The Netherlands), EURONET (European Economic Community), PSS (United Kingdom), EDWP (Switzerland), and TRANSPAC (France). Also supported is the X.21-based NORDIC Net (Scandinavia, Finland). DSA uses High-level Data Link Control (HDLC), also an ISO standard, for data communications between intelligent devices in private networks. Users can configure hierarchical, peer-coupled and hybrid network topologies.

Product Implementation

DSA already enables medium-scale and large-scale host computers and mini-computers to operate in a variety of network configurations. Specialized network processors can be utilized for front-end processing, remote concentration and switching, in addition to communications control and administrative functions. The implementation includes such distributed processing applications as file transfer, remote job entry, terminal concentration and two-level transaction processing as well as office automation applications, including document distribution and host storage, and printing of documents. In addition, DSA administration permits monitoring, control, and maintenance of the network from one or more control sites.



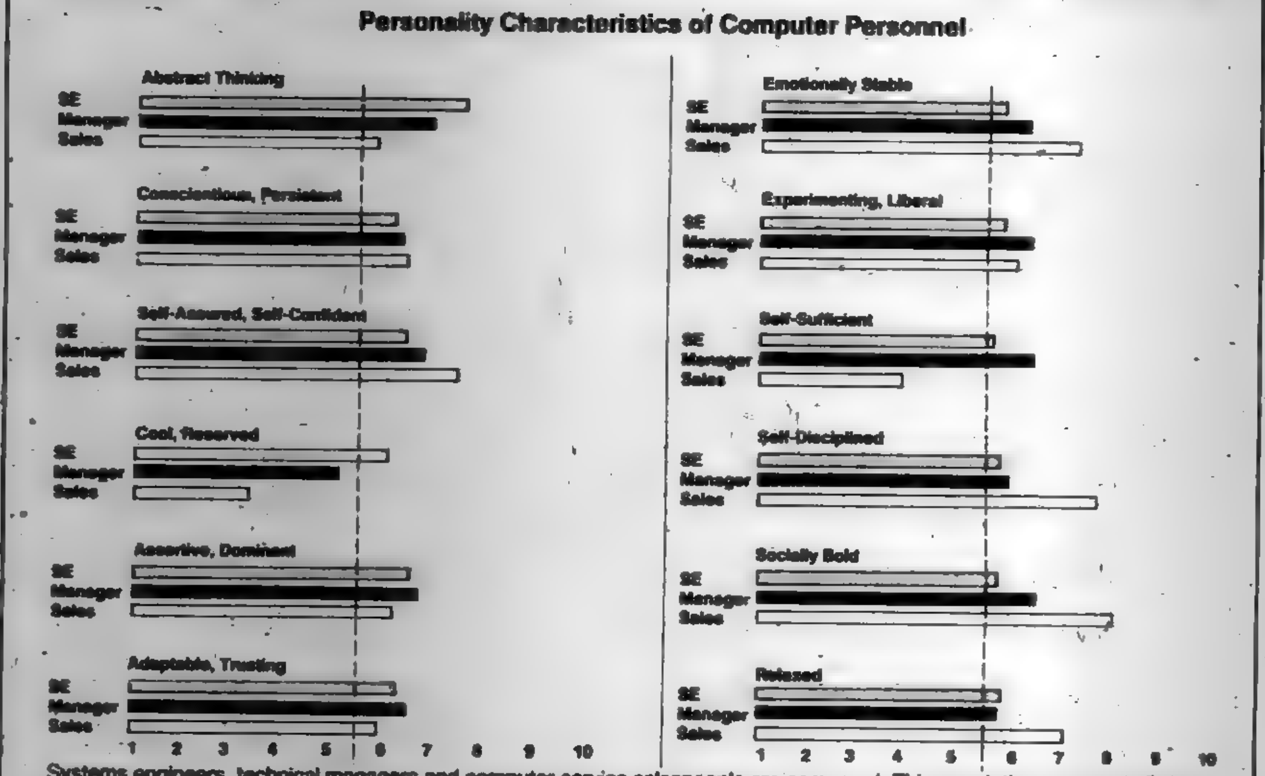
DSA consists of seven layers of functions and protocols governing data handling among network nodes. DSA's implementation of the bottom four layers makes physical exchanges across the network transparent to the end user.

Future Growth

DSA is an important part of Honeywell's implementation of its Distributed Systems Environment (DSE). Future DSA developments will support fully-distributed transaction processing with system-supplied coordination, control, and recovery, load leveling, and resource sharing across computers. This type of peer network will allow host and satellite processors to cooperate as full equals in distributed systems. The open architecture will be further enhanced to meet evolving international network standards while protecting investments in systems already installed. Additionally, data bases will be partitioned across multiple processors with automatic access and updates at all locations. Thus DSA is part of an evolution to fully distributed systems with globally accessible resources.

More on Distributed Processing Networks

For an in-depth description of the DSA open architecture call our toll free number, 800-343-6294 (in Massachusetts call 617-895-6000) or write Honeywell, 200 Smith Street (MS 487), Waltham, Massachusetts 02154.



Systems engineers, technical managers and computer service salespeople are compared. This population average is 5.5 on a 10-point scale.

Figure 1

(Continued from In Depth/6)

— through psychological testing — of the nature of DP professionals.

For the past two years, Computer Task Group (CTG) in Buffalo, N.Y., has been offering a test to its employees to help them learn more about themselves and improve their career planning. Under the supervision of a psychologist, CTG has been administering a personality test called the 16PF. The test includes comparative data so that individual results can be interpreted against population norms.

To date, about 150 CTG employees have taken the test, including programmer/analysts, marketing representatives and most of the technical managers. Everyone who participated in the hour-long testing received a confidential, five-page, computer-generated narrative description of his personality, as well as a summary profile showing his results compared with other adults and other groups within the company.

The positive reaction to this relatively inexpensive test has resulted in its inclusion as a regular part of management education programs. However, what was intended primarily as an opportunity for individual self-assessment has become a source of valuable information about computer personnel — not only programmers and systems analysts, but those who have been promoted from the technical ranks to managerial positions, as well as the computer service salespeople.

Group profiles of DP people have been developed by pooling individual data from 16PF. The systems engineer group at CTG includes all the technical people who work as applications programmers, systems programmers and systems analysts. The managers of these systems engineers usually come from the technical ranks, as do the marketing representatives, who typically have entered sales after some experience at the less senior systems engineer level. Psychological testing has revealed three different patterns of personality that characterize individuals in these three job categories (see Figure 1).

This profile of computer personnel is based on a group composite. There may be considerable individual variation of any of the factors described, and even the same person at different times or in different situations may show behavior that departs markedly from the profile. What the profile shows is how the three groups tend to be alike. Based on recruiting and training practices, there is no reason to think that CTG systems engineers are atypical; however, caution must be exercised in generalizing before more data has been gathered, especially from personnel not in a computer service company.

Profile of Systems Engineers

Psychological testing has identified six aspects that are characteristic of systems engineers:

1. *Able to engage in abstract thinking.* Not surprisingly, systems engineers are bright people — fast learners, intellectually adaptable and significantly more intelligent than average. Their work requires the ability to think abstractly, to solve problems using logic and reasoning. Understandably, then, if their jobs are not stimulating or programmers feel underutilized, they may look somewhere else for challenging work, as evidenced by the pattern of frequent job changes found in the industry.

2. *Conscientious, persistent*. Systems engineers stand out as being persevering, responsible and emotionally disciplined. To a great extent, success in doing the work itself requires these characteristics. Beyond merely doing the job, however, these traits make systems engineers work nights and weekends, for example, to generate an operating system that will be ready when other programmers need it.

High intelligence plus a high degree of pesistence results in a strong drive to achieve. As J. Daniel Couger and Robert A. Zawacki report in *Motivating and Managing Computer Personnel* (Wiley-Interscience, 1980), data processing professionals have higher growth needs than people in any of 500 job categories surveyed in that report. They have a strong need

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for personal growth and accomplishment — to be stimulated and challenged and to develop. The necessary foundation for such accomplishment is intellectual capacity combined with a strong inclination to be conscientious, persistent and dedicated to the task.

Closely associated with conscientiousness is superego strength or strength of character. This can be seen in the systems engineer's concern with moral standards and rules.

In a 1981 job satisfaction survey, CTG employees indicated that their jobs gave them a very high degree of satisfaction with regard to their moral values. While perhaps not critical to the bottom-line success of a business, it appears that having a job that is consistent with their moral values may be especially important to systems engineers.

3. Self-assured, self-confident. Systems engineers, on the whole, tend not to be insecure or worrying types. They often project a high degree of optimism about their ability to do a job — sometimes even overoptimism, when it comes to having programs ready by a given deadline.

This self-assurance may be accompanied by a lack of concern about other people's approval or disapproval. The programmer receives rapid feedback about how he is performing and whether the outcome of the work is satisfactory. Getting the program to run the way he wants, though, is more important to the programmer than the approval of his peers. The systems engineer's self-confidence is built up more from knowing that he is doing the task successfully rather than from social feedback from co-workers or supervisors.

In this regard, Couger and Zawacki report that DP professionals have low "social-need strength" or need for interaction with others. This is not to say they are antisocial, but rather that their source of reinforcement or satisfaction is less likely to come from others than from doing the job right. Regardless of how self-confident they were when they started, people who remain in DP are likely to develop an even greater confidence in their own capacity from their success in carrying out their work.

4. Cool, reserved. Personality testing reveals that systems engineers are, in fact, more aloof, detached and reserved than people in general. They have a desire to be precise in their way of doing things and show more of a preference for working alone and working with things, rather than with people.

Test scores indicated a tendency to be stiff, even critical, as opposed to warm and easygoing. Although these scores are not extreme, they are different enough from average to contribute to the stereotype of the unsociable programmer.

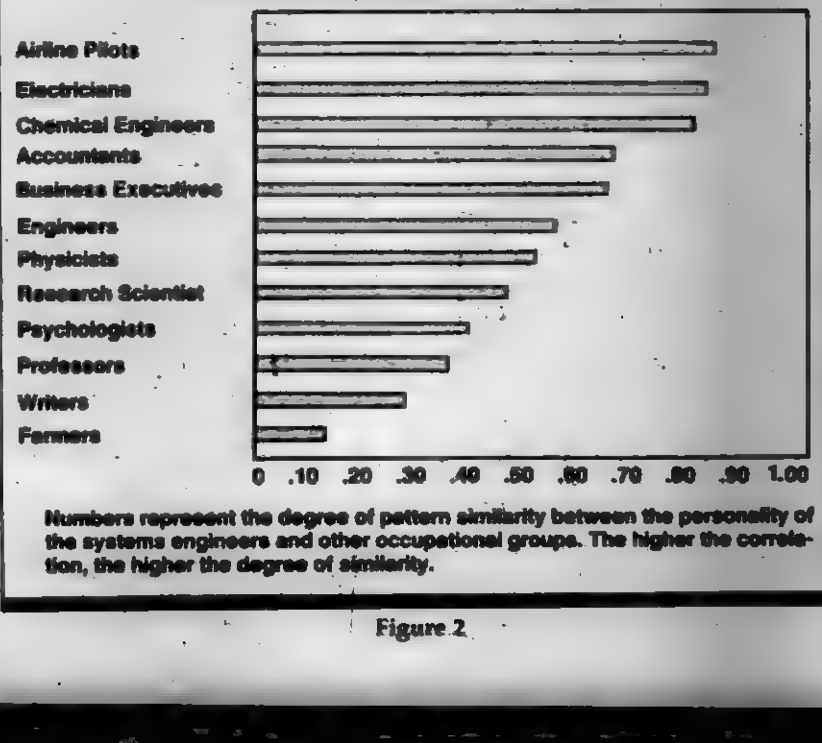
5. Assertive, dominant. Computer people tend to be authoritative, forceful and action-oriented. Not easily upset by authority, they may come across as headstrong and unconventional. While, of course, each individual is different, the combination of high intelligence, self-confidence and assertiveness may result in the prima-donna syndrome occasionally seen in systems analysts. In the extreme, they may demand admiration and lack humility.

6. Adaptable, trusting. Systems engineers tend to be adaptable and accepting of change rather than inflexible or dogmatic. These characteristics are consistent with the high-growth needs found by Couger and Zawacki. Adaptability is necessary for survival in a field where technological advances occur so rapidly and where, without an openness to reeducation and updating of skills, one's obsolescence is virtually guaranteed.

A trusting and accepting nature makes computer people easy to get along with (though not especially easygoing), tolerant rather than tyrannical and ready to forget difficulties rather than dwell on frustrations. This adaptability is not limited to technical areas, and the test results suggest that systems engineers would be open to innovation in the behavioral and communications areas as well. They are also predisposed to be good team members when they do work with others.

Figure 2 compares systems engineers and people in various other occupational groups. By calculating a statistic called the "coefficient of pattern similarity," the degree of similarity between the group of systems engineers can be compared with any of the other occupational groups for which personality data on the 16PF is available. Clearly, systems engi-

Similarity of Systems Engineers To Other Occupational Groups



Numbers represent the degree of pattern similarity between the personality of the systems engineers and other occupational groups. The higher the correlation, the higher the degree of similarity.

Figure 2

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neers are very unlike professors, writers and farmers and highly similar in personality to chemical engineers, electricians and airline pilots — a diverse group which nonetheless shares a systematic, procedural orientation to its work.

The DP manager has usually been promoted from the systems engineering ranks and has a technical background. The managerial position, however, involves a high degree of social interaction and requires behavioral skills, including the ability to communicate effectively with a wide range of people.

No longer responsible for doing the technical work themselves, managers must now get the work done through others. While the managerial job requires interpersonal skills, a predisposition to social interaction was not a strong characteristic of the systems engineers. Are the managers different?

Managers were similar to systems engineers in five of the six aforementioned traits. Unlike the technical people, however, they are not cool and reserved — and they are outgoing and warm. The DP manager is also distinguished by four other traits:

1. *Emotionally stable.* Managers stand out as emotionally mature, stable, unruffled and realistic about life. They tend not to let their emotional needs obscure reality.

2. *Socially bold, venturesome.* Not shy or timid, managers are sociable, spontaneous and apt to be adventurous. They are particularly suited for the task of dealing with people.

3. *Experimenting, liberal.* DP managers have inquiring minds and are inclined to question traditional ideas and experiment with problem solutions. According to the *16PF Handbook*, executives and scientific researchers also have these traits.

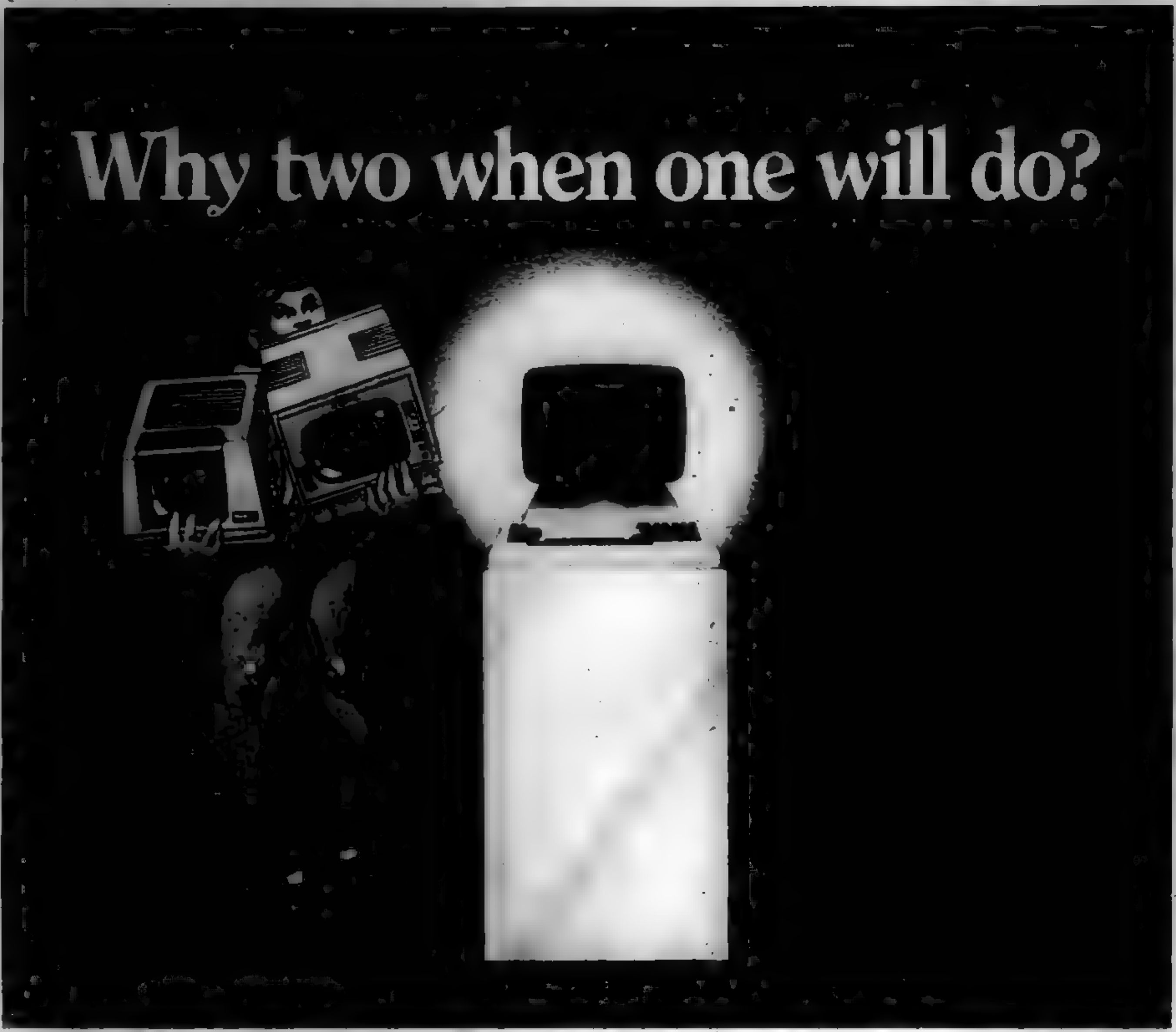
4. *Self-sufficient.* DP managers are self-sufficient and resourceful, accustomed to going their own way, making decisions and taking action on their own.

As one goes from the technical to managerial positions, there appears to be an increase in personal comfort and social competence. The CTG managers are able to make decisions on their own and deal with people in personal and business encounters with relative ease. Whether this change comes about from training and success on the job or whether managers have more of these characteristics at the outset cannot yet be determined, as nearly all were experienced managers at the time of testing.

By retesting the current nonmanagers and comparing those who later become managers with those who do not, it may be possible to determine the extent to which the manager's personality profile is present at an early stage or whether it is developed through training and experience.

Marketing Representatives

The personality profile of the marketing representatives reveals that they are significantly more outgoing,



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socially bold, emotionally mature, self-assured and relaxed than technical people. Like systems engineers and managers, they are more dominant, assertive and conscientious than the average person.

Unlike the stereotype of the impulsive happy-go-lucky salesman, these computer sales personnel are highly self-disciplined and exert strong control over their emotions. This is needed in order to face the possibility of rejection and get "up" for another sales call.

Being, in addition, persistent, socially bold and self-confident, these market representatives appear to have all the qualities deemed necessary for success in sales. Unlike the technical people, however, they are inclined to follow protocol and adhere to social convention, behaviour which is also important for winning business acceptance.

Not surprisingly, marketing representatives are significantly more group-oriented than average, preferring to work and make decisions with others. In this regard, they stand in sharp contrast to the technical and managerial groups, as they are considerably more dependent on others for social approval. Approval from others is, of course, an integral part of being successful in sales, and it would appear from their success that the market representatives' personality profile is most consistent with the requirements of their job.

Matching Personality, Job

The results of psychological testing can begin to dispel some of the myths about DP people and bring about a better understanding of the complex nature of people who enter and move within the computer field. But description, however, is only one positive outcome of testing. Beyond the immediate benefit to the individual, good psychometric instruments allow us to make use of sophisticated techniques for predicting job success.

The profile-matching technique in particular, which compares the personalities of the systems engineers group with other occupational groups, is a valuable statistical tool for early identification of those technical people with managerial or sales potential.

At CTG, it is now possible to identify which of the technical people have personality profiles most resembling those of the successful salespeople and managers. Although no two people will be exactly alike or match the profile exactly, there remains a pattern of shared similar traits that does characterize the individuals in each of the three occupational groups and allows predictions to be made.

While psychological testing has far to go to predict with certainty who will be right for a particular job, it does indicate what the people in those computer-related jobs are really like. Techniques from the behavioral sciences have helped dissipate the stereotype of the programmer or systems analyst as a weird or eccentric "computer freak.".

About the Author

Dr. Judith E. Larkin is an associate professor of psychology at Canisius College in Buffalo, N.Y. She is an industrial/organizational psychologist specializing, in the computer service industry.

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think again.

(Continued from In Depth/7)

structured environment. If she is to survive and flourish there, she may have to alter her thinking. Management may also have to find ways of loosening its structure.

Technical thinkers like Sharon are often task-oriented. Numbers, ideas and machines come first to the task-oriented, people's concerns second. Task-oriented people prefer working alone, avoid social small talk and dislike interruptions when focused on a project, even when their jobs require that they work with others.

Problems arise when creative types express ideas if they do not consider the needs of others. A sense of urgency accompanies their presentation of new ideas, and this can make them appear insensitive to the status quo, to others' egos.

Creative people can develop superior attitudes, often defensive responses to seeing their ideas rejected. These ideas often collide with the organization's natural web of political hierarchies. Creatives people's "superiority" often gives way to outright frustration in the face of normal delays in a company's decision-making process. Their frustration can lead to isolation.

If isolation persists, teamwork easily erodes, High-tech environments fragment when too many employees focus too narrowly on purely personal interests or pet projects, neglecting company objectives.

In these situations, management must build strong team attitudes and communicate in ways that lead creative people toward the values and needs of the group — of the total organization — and away from self-interest. But this is easier said than done.

For example, a corporate client discovers that communication problems within a special task force prevented it from accomplishing its mission. The group consisted of eight technical specialists, each from a different department. A series of problems was to be solved for one of the company's industries, but the mission stalled when communication among team members failed. Each member believed he knew more than every other member.

It was not until forceful feedback was given, in private sessions, that members began to notice their own communication barriers and hear what others had to say. Management could have, in this instance, recognized the problem and asserted itself sooner.

Management must be sensitive to the unique working characteristics of creative employees. Also, it must resolve the basic conflict between the need for orderly organizational processes and the intense need the creative have for freedom of expression. Improvement of communication skills at the managerial level is an important first step.

Creative employees are rarely nurtured and groomed into contributive organization players by management. These employees are not usually helped to think of the needs of others when generating and presenting ideas. As American industry evolves into the postindustrial era, an era characterized by unprecedented change and ambiguity, the need for creative thinking grows more urgent.

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stitutions and high-technology opportunities make a high-tech, creative population more probable. Our larger, more bureaucratic organizations could find themselves in serious trouble if steady and increasing injections of creative intelligence are not shot into the system.

Creative intelligence is among the commodities companies can least afford to waste. Yet most organizations — and most managements — are unfamiliar with its characteristics.

Being creative entails bringing something into existence that never existed before — imposing order on chaos, finding hidden patterns in disorder. That process involves experimentation, analysis, insight and even failure.

Management should first recognize and respect the fact that creative people look at things differently: They invent the unexpected and the untimely. Creative people often bring the majority of their difficulties on themselves. When this is understood, management can help creative people work with, rather than against, systems and can help them avoid strangulation in their working environment.

Five Questions for Management

Management can ask itself five questions about its stance toward the high-tech creative employee:

1. Do managers unwittingly punish idiosyncratic behavior or thinking? Some companies subtly punish the creative person through social isolation, put-down humor, holding him to rigid job descriptions, denying him promotions or subjecting him to review sessions in which he is urged to be "more like others."

2. Do managers know what talents their subordinates have? Do they know what makes work satisfying for each employee on their team? People's work needs vary. Money is usually not the most important element of work fulfillment for the creative person. Creative types need the satisfaction of using their minds on complex problems.

3. Do managers help creative people find both satisfaction and discipline within the working day? Creative people must want to channel their intensity toward the greater good of the team. Managers who cannot help creative people see ideas and problems from a variety of perspectives cannot help pull creative effort into usable form.

4. Do managers help creative people work with others to achieve personal goals? Five strategies can help managers work with creative employees (see box). The objective is to help employees express novel ideas appropriately — so the goals of others and the company are met.

5. Do the organization's practices encourage and use creative talent? A variety of promotional paths need to exist in order to utilize creative talent. Creative people need to advance into positions more challenging and personally satisfying, positions not always along the managerial path for those with technical leanings.

Leadership must never underestimate its power to be mimicked. When top management is staid, conservative and conforming, most middle management will follow suit. By scrutinizing its own practices at all levels, management can develop creative management techniques to serve the creative subordinate.

One of the best techniques is the mini-think-tank. Communication techniques and a dependable vehicle for open-forum problem solving brings forth many creative ideas, as well as serving as a sound way of providing recognition and acknowledgement for bright, innovative employees. The mini-think-tank technique cannot be used by an organization whose top management is, at heart, closed to the creative spirit.

Managing creative talent, especially the highly specialized technical innovator, is a challenge. But when these employees are encouraged and helped to contribute generously and with self-discipline to the needs of a company, everybody wins.

About the Author

Dr. Marsha Sinetar is president of Sinetar & Associates, Inc. in El Segundo, Calif. She is an organizational psychologist, mediator and futurist. Her firm provides management advisory functions to corporate top management in human resource planning and development and mediation.

Strategies to Help the High-Tech Creative Get Ideas Across to Others

Each point calls for a gradual enhancement of interpersonal skills and attitudes. Each also demands that managers be effective, adroit and mature communicators. These ideas involve no "quick fix."

1. Help the individual talk about new ideas in terms others can understand — so that they can see how new ideas are helpful to their own goals.

2. Help the individual state criticism of the "old way" constructively, so that language does not tear at the fabric of other people's authority, or egos, or imply that the proposed change is the "right way," all other routes to the same end being wrong.

3. Help the individual become sensitive to others' fears and needs. No one really likes abrupt change or wants to feel he isn't bright or valuable, and the creative employee's expressions must show that he accepts others as important in their own right.

In this category, employees should be helped to evaluate themselves as listeners; they should be helped to listen to the objections of others (rather than being offended or turning off to counter-suggestions) and should be given very specific, firm feedback if their communication styles are creating problems.

4. Help the individual focus on the job itself — not on the possible status he wishes to have as a result of his creative input. If he is perceived as being self-serving, instead of as serving the interests of the team or the company, even the best suggestions will be turned down.

5. Finally, help the individual understand the importance of working with and for the benefit of others — perhaps even to rate himself on the ability and willingness to be part of the team.

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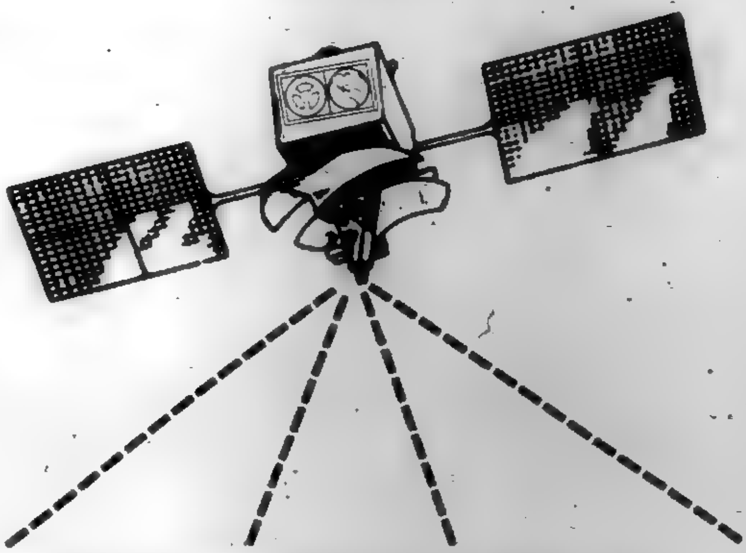

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We recently did a study of *Computerworld* subscribers to determine their level of involvement and interest in communications. Of the 84% now using or planning to use communications equipment and services, 72% are personally involved in its selection and/or implementation. We found that these subscribers depend on *Computerworld* for communications information and prefer its coverage by more than 4 to 1 over the next publication in the field. This segment of our audience has a critical need for in-depth information on the constantly changing technology of communications.

As *Computerworld* expands its weekly news coverage of communications with interpretive information on products, equipment and services, *Computerworld On Communications* will complement that coverage with focused attention on the boarder issues facing business communications users.

Computerworld On Communications will keep readers current on changing trends in the design, acquisition, operation, and optimization of corporate communications facilities. It will look at communications and networks from a systems perspective that relates technical capabilities with corporate goals.

In the two issues for 1983, *Computerworld On Communications* will apply the proven editorial resources of *Computerworld* to the area of communications networks. It will look at the implications of enhanced communications within the business organization together with the impact on established systems operations.

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Experimental Switch Developed by IBM Employs Cryogenics

YORKTOWN HEIGHTS, N.Y. — Researchers at IBM's Thomas J. Watson Research Center here have developed a superconducting electronic device with a switching speed of about 300 psec.

Called the quiteron by its inventor, Sadeg M. Faris, the device employs a cryogenic process similar to that used in Josephson Junctions. In both devices, superconductivity — the phenomenon that certain materials lose virtually all resistance when cooled to near-absolute zero — plays a key role.

While still in the experimental stages, IBM said the quiteron can be used in circuit designs similar to ordinary transistors. The device has a switching speed of 300 psec and a power dissipation that is 1% that of semiconductor transistors on the market today.

In addition, the quiteron has demonstrated an ability to return to equilibrium after excitation. That means the quiteron is believed to be immune to a latching problem that has caused problems in some Complementary Metal Oxide Semiconductor technologies.

IBM said scientists should be able to scale the quiteron down to lateral dimensions of about 0.1 micrometers. That means the device is a candidate for use in high-circuit density applications.

The quiteron is a three-terminal superconducting device which, IBM said, can both amplify and switch. That gives the device the potential for applications in analog and digital circuits.

IBM also pointed out that the device's design and operation have yet to be optimized.

MDS Bundles 'Express,' Targets Office Automation

The Express E300 System

By Lois Paul
CW Staff

WALTHAM, Mass. — Two models of a decision support system machine — versions of its Express DSS bundled with a Prime Computer, Inc. 2250 minicomputer — were introduced here recently by Management Decision Systems, Inc. (MDS).

Called Express E300 and E600, the multiuser hardware/software systems are intended for use in office environments, outside of DP departments, according to the vendor. The firm considers them a lower cost means of introducing Express, which as a stand-alone package sells for up to $300,000.

Many users felt they had to start out with something cheaper and then work up, according to John S. Wurts, president of MDS. Justifying the outlay of up to $300,000 for software was difficult for them. Therefore, the E300/600 systems are targeted directly at a single department within a large firm.

He noted that the systems can support a variety of terminals and peripheral devices and can be configured in a network using Prime's Primenet networking capability. The systems also can be linked to Prime 850 mainframes.

'Full Version' of Express DSS

Walter E. Lankau, vice-president of MDS, stressed that the software bundled in the E300/600 systems is a full version of the mainframe-oriented Express DSS, "not a watered down product." It includes an operator interface designed to allow it to be used by non-computer-oriented personnel, as well as computer-aided instruction to train new users, he explained.

Wurts indicated that the Express minicomputer-based systems are being pitted directly against the personal computers

(Continued on Page 50)

Incorporates Winchester Disk

IC-475 Disk Copier Announced

TUSTIN, Calif. — A system that copies 5¼-in. and 8-in. single-sided disks at initialization speed has been announced here by Applied Data Communications, Inc.

The IC-475, which incorporates a Winchester disk with the associated hardware, copies on one revolution, verifies on the next and steps on the third.

The system is reportedly capable of speeds of 25 seconds for a 5¼-in. single-sided disk and less than 40 seconds for an 8-in. single-sided disk, a vendor spokesman explained.

Using the phase-lock recovery, write compensation and read margin techniques, the IC-475 is said to perform automatically the following operations in its copy cycle: spin speed testing, surface evaluation, automatic initializing, write copy, user and data verification.

Prices for this product start at $21,600. Further details are available from the vendor at 14272 Chambers Road, Tustin, Calif. 92680.

Gifford Micro Supports CP/M

SAN LEANDRO, Calif. — Gifford Computer Systems, Inc. has announced an S-100-based microcomputer that reportedly supports Digital Research, Inc.'s CP/M operating system and conforms to the IEEE 696 communications standard.

Based on the Motorola, Inc. 68000 microprocessor, Gifford's microcomputer system can directly access up to 16M bytes of main memory without segmentation registers, a spokesman said.

Standard features of the system include 256K bytes of main memory, nine serial ports, a 20-slot motherboard, a real-time clock/calendar and 2.4M bytes of removable mass storage, a spokesman for the vendor said.

Systems cost from $5,345 for a single-user floppy-disk-based system to $14,505 for a six-user system with a Winchester disk drive and 512K bytes of main memory.

Additional information is available from the vendor at 1922 Republic Ave., San Leandro, Calif. 94577.

CW Wants Your CAM . . . Input

CAM, MRP and FMS are some of the hottest new topics in the world of computers. *Computerworld* wants to tell its readers more about computer-aided manufacturing, materials resource planning, flexible manufacturing systems, robotics and shop-floor control.

The April 25 issue of *Computerworld* will provide in-depth coverage of manufacturing in transition and the role computerized systems are playing. We are looking for articles on how the new manufacturing technologies fit together and what they all mean to DP operations in a manufacturing environment.

Industrywide tutorials on all aspects of computers and manufacturing are welcome. Other areas of interest include user experiences, application stories, studies, management strategies and psychological effects.

Articles should be between five and eight pages, double-spaced and typed. The deadline is March 18, but the sooner we get your manuscript, the better the chance it will be used.

Submit your stories to Bruce Hoard, *Computerworld* Editorial, P.O. Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

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Micro-Based System

Medical Manager Offered

MORRIS PLAINS, N.J. — A microcomputer-based medical practice management system that improves cash flow by expediting patient account and insurance claim tracking has been introduced by Monroe Systems for Business, a division of Litton Industries, Inc.

The Promed system, based on Monroe's Occupational Computer 8820, is backed by the firm's 350 U.S. service centers and support staff. Aimed at solo and small group practices, Promed features patient billing, budget plan status and patient recall functions.

The system is said to improve cash flow by expediting patient account and insurance claim tracking. The microcomputer with 128K bytes of random-access memory costs $4,385; the 80-col., 120-char./sec dot matrix printer costs $1,595; and the system software costs $3,700, including instruction and installation.

The vendor is located at The American Road, Morris Plains, N.J. 07950.

DEC Cuts LSI-11/23 Board, PDP-11/23 Plus Prices

MAYNARD, Mass. — Digital Equipment Corp. has announced price reductions of up to 36% for its LSI-11/23 CPU boards and up to 18% for its PDP-11/23 Plus packaged CPU assemblies.

Effective immediately, the new prices cover two board-level microcomputer products and four box-level assemblies. The cuts were made possible because of high-volume production of the units, according to the firm.

The price for the LSI-11/23 CPU board with memory management unit has been reduced from $2,110 to $1,340. Without a memory management unit, the price is reduced to $1,140 from $1,690.

The price of a PDP-11/23 Plus with 256K bytes of random-access memory (RAM) and a nine-slot backplane has been cut from $6,950 to $5,690 for both 120-Vac and 240-Vac models. A PDP-11/23 Plus CPU box with 512K bytes of RAM and a nine-slot backplane has been cut from $7,950 to $6,690 for both 120-Vac and 240-Vac models.

DEC is headquartered at 146 Main St., Maynard, Mass. 01754.

Feature Extends Alphaword III+

FAIRFIELD, N.J. — Compuscan, Inc. has announced a mark sense capability on its Alphaword III+ page reader.

The mark sense feature, often used to score multiple choice tests, can be used to enter data from a variety of documents. This information can then be sent to word and data processing systems, according to the vendor.

The Alphaword III+ costs $29,500.

Compuscan is located at 81 Two Bridges Road, Fairfield, N.J. 07006.

Adviser Series Gets Addition

MINNEAPOLIS — Computer Designed Systems, Inc. has announced a new product family within its Adviser Series of computers for the manufacturing, wholesale distribution and medical industries.

The basic Adviser Micro-Plus configuration includes a CRT terminal, 120 char./sec printer, 128K bytes of memory and two 5¼-in. floppy disk storage devices with optional upgrades, including Winchester capabilities.

The unit can communicate locally or remotely with larger computer systems made by the vendor. Base price of the system is $5,000 from the firm at 10911 Olson Memorial Highway, Minneapolis, Minn. 55441.

HP Cuts Prices On Graphics Aid

PALO ALTO, Calif. — Hewlett-Packard Co. has cut prices on the graphics package for its HP 2680A laser printer by up to 21%, depending on options ordered.

U.S. list prices now range from $16,115 to $28,115, a savings of as much as $7,500 over the old prices, according to a company spokesman.

The HP 2680A graphics package includes firmware, memory and graphics support software said to allow graphics to be output from non-HP sources as well as from the firm's HPdraw, HPeasychart and DSG/3000.

Price cuts also apply to the 45 page/min HP 2685 laser print station, now priced at $164,500 with 128M-byte disk, a $1,000 savings, the vendor said.

HP is headquartered at 3000 Hanover St., Palo Alto, Calif. 94304.

Daisywheel Printer Added to Sanyo Line

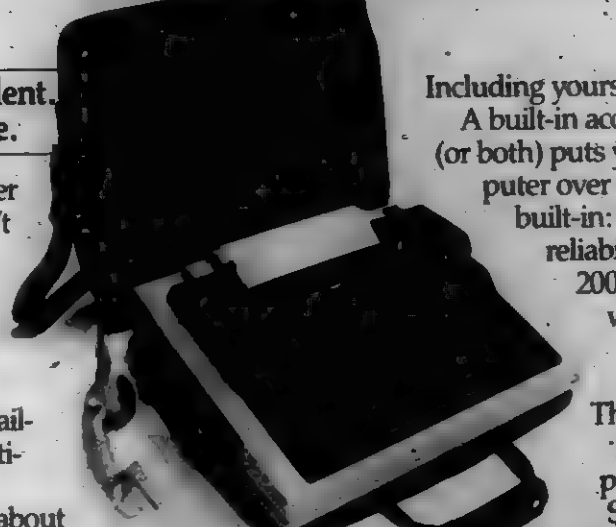
MOONACHIE, N.J. — Sanyo Business Systems Corp. has announced the addition of a 16 char./sec daisywheel printer to its line of computer peripherals.

Model PR5500 reportedly features an adjustable typing pitch, bidirectional printing and will handle 17-in.-wide paper.

It is compatible with most word processors and other computers offering a Centronics Data Computer Corp. parallel interface, according to the vendor.

This product has been priced at $995, Sanyo Business Systems said from 51 Joseph St., Moonachie, N.J. 07074.

Digital's portable terminal. The only thing plain about it is the paper it prints on.



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Features Expanded Storage

Microfiche Recorder Updated

SAN DIEGO — A microfiche recorder with reportedly expanded storage and formatting capability beyond previous models has been announced by Datagraphix, Inc.

The Mini-Autocom Model II employs a 20M-byte Winchester disk for improved reliability and increased job setup capability. It converts computer-generated tapes into cut, dry nonreversal or optional reversal microfiche, ready for duplication.

The unit is said to accept virtually any print image or computer-output-microfiche formatted tape. Prices start at $128,000, and the firm can be reached through P.O. Box 82449, San Diego, Calif. 92138.

Torch Slashes Micro Prices

WOBURN, Mass. — Torch Computer Corp. slashed prices on the Torch micro from $6,500 to $4,995.

The cost of the hard disk version has also been reduced from $10,000 to $7,995. The Torch systems reportedly offer a variety of communications capabilities.

Further details can be obtained from Torch headquarters at 61 Commerce Way, Woburn, Mass. 01801.

Thought Works Introduces Small Business System

PHOENIX — A multiuser, Digital Research, Inc. CP/M-compatible small business system has been announced by Thought Works, Inc.

The 8-bit Model TW-800 is expandable to 12 terminals and 20 printers. Options include 20M bytes of Winchester hard disk memory.

The system lists at $9,275. A totally configured 10-user system can be delivered for about $2,100/user, the firm said from 3532 W. Thomas Road, Phoenix, Ariz. 85109.

MDS Offers DSS Models

(Continued from Page 47)

that many end users are bringing in to help them handle analysis of data. "As far as I am concerned, personal computers are absolutely outstanding for personal use," Wurts said, adding that the trouble occurs when they are brought into a corporation.

According to Wurts, Express, the software package, will run on the next generation of personal computers.

The E300/600 has 2M bytes of memory, expandable to 3M bytes, and 68M bytes of hard disk storage, which is expandable to 632M bytes. Both systems can support between 12 to 15 users. E300 can support three simultaneous users; E600 can handle six simultaneous users.

The E300/600 for finance was designed for financial reporting, analysis and modeling. It includes data base management capabilities, report and graphics features, a complete set of financial and statistical analyses and advanced modeling techniques.

The E300/600 for marketing supports applications such as sales planning, sales tracking and control, marketing mix analysis, strategic marketing planning, market evaluation and new product development. It includes report and graphics capabilities, marketing analysis features, including competitive comparisons, trend analyses, and pre- and post test analyses and modeling and forecast features.

The E300 system is priced at [illegible]25,000; the E600 will sell for $180,000. More information about the products is available from MDS, 200 Fifth Ave., Waltham, Mass. 02254.

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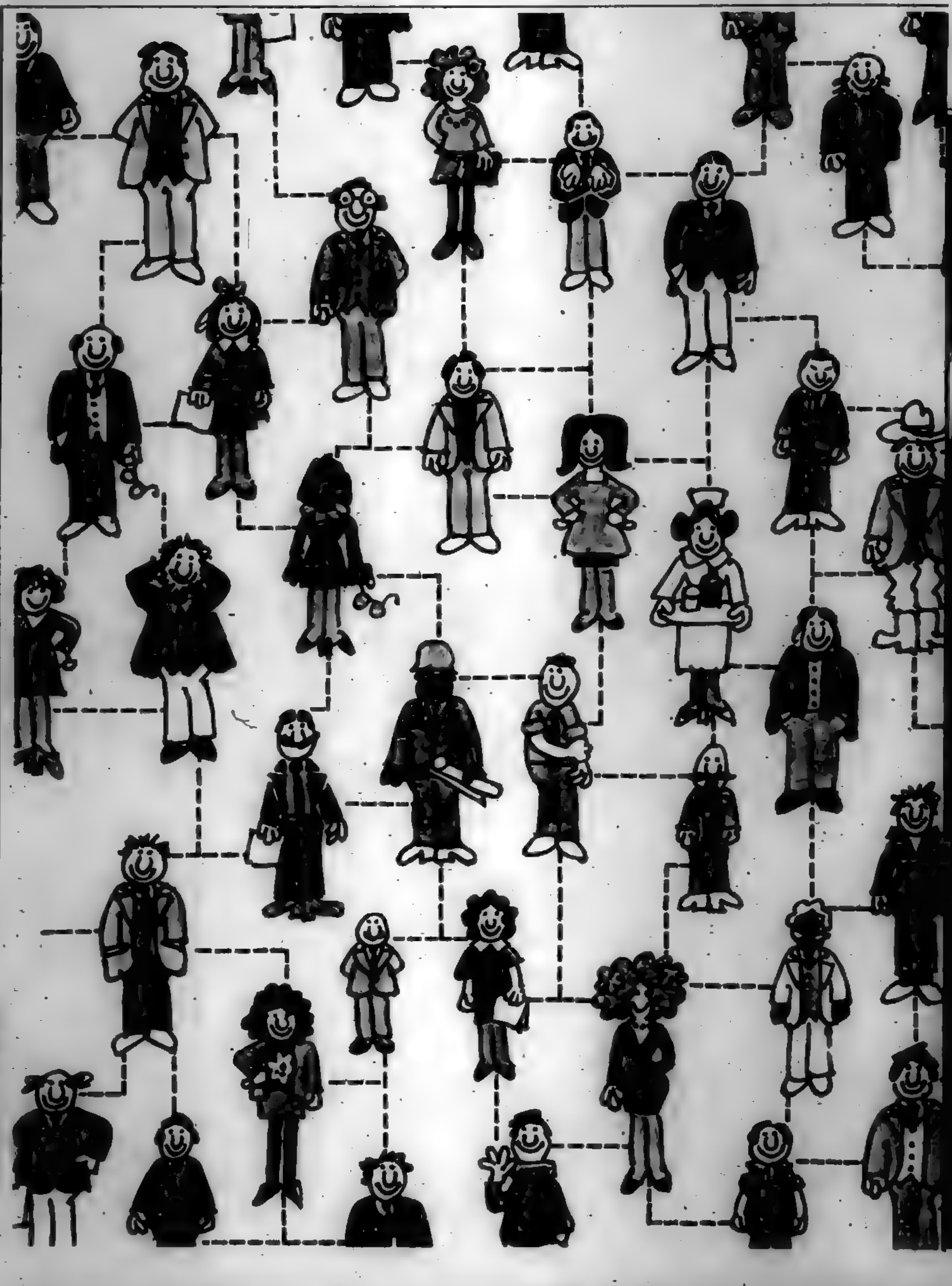

Bits & Pieces

Supermouse Serves 8-, 16-Bit Systems

SUNNYVALE, Calif. — Televideo Systems, Inc. has announced Supermouse, an optical mouse for the firm's line of 8- and 16-bit systems.

Supermouse allows the user to manipulate stored data on a CRT terminal without using keyboard commands. By moving the mouse over a specially designed grid, the user reportedly can direct the cursor to any location on the screen.

It costs $99, the vendor said from 1170 Morse Ave., Sunnyvale, Calif. 94086.

Memory Board Line Fits Wang VS CPUs

NEWTON, Mass. — EMC Corp. has announced a line of memory boards for Wang Laboratories, Inc. VS series processors.

Memory boards are available for Wang VS-50, VS-80, VS-90 and VS-100 processors. Capacities range from 128K bytes for the VS-50 and VS-80 processors to 1M byte for the VS-90 and VS-100 processors, the vendor said.

The memory boards are hardware- and software-compatible with the Wang host processor, and no modifications are necessary to the host system, according to the company.

The memory boards cost from $2,500 for a 128K-byte configuration for the VS-50 and VS-80 to $8,900 for a 1M-byte configuration for a VA-90 and VS-100 system. The vendor is located at 385 Eliot St., Newton, Mass. 02164.

UPS for Micros Boasts No-Break Power

ADDISON, Ill. — Instrumentation and Control Systems, Inc. has announced Lifeline, an uninterruptable power supply for microcomputers.

The unit features a no-break power feature that provides voltage regulation and line filtering. The unit also includes an inverter that provides power for up to 10 minutes during an outage, the vendor said.

Batteries can be 90% recharged in about 40 minutes, and larger batteries can extend backup power to about 40 minutes, the vendor said.

Available in 200 VA, 600 VA and 1,200 VA configurations, units are priced from $1,042, the vendor said from 520 Interstate Road, Addison, Ill. 60101.

Graph/Net Targets Integrated Design

CAMBRIDGE, Mass. — A computer integrated design system for architects, engineers, designers and facility planners has been introduced by Graphic Horizons, Inc.

Graph/Net includes interactive software for layout optimization, drafting, dynamic perspective simulation and data management; a computer with high-resolution screen and graphics processor; and a workstation.

The computer is from Three Rivers Computer Corp. of Pittsburgh, Pa., and includes 1M byte of memory, 24M bytes of Winchester disk, a 16-bit bit-sliced processor and a black-on-white graphics screen.

The system costs $59,265 from the vendor at Box 312, Cambridge, Mass. 02238.

Pro-Log's Developer For Buses Fits SP/M

MONTEREY, Calif. — Pro-Log Corp. has announced ABL-1, a general-purpose standard bus development system that is compatible with Digital Research, Inc.'s SP/M operating system. The system is designed for use as a software development tool or as an OEM target system.

The unit uses an 8-bit Zilog, Inc. Z80A microprocessor with 64K bytes of static random-access memory. Also included are two thin-line 8-in. floppy disk drives, offering up to 3.2M bytes of double-density storage, a single-density controller and two RS-232C ports.

Systems cost $6,295 and will be available in March from 2411 Garden Road, Monterey, Calif. 93940.

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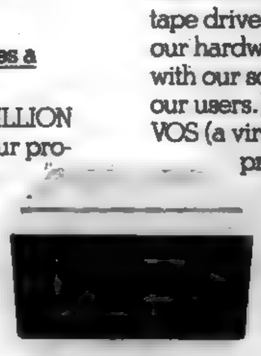

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'At Most, Adequate'

Need for Quality Micro Software Seen

By Bruce Hoard
CW Staff

"Even the best and most robust personal computer word processing software is, at most, adequate," Amy Wohl, president of Advanced Office Concepts Corp., said in a recent interview.

Wohl's comment underlines a basic problem facing the growing force of personal computer users as they apply their machines to production-oriented, office word processing: The quality hardware is here, but the quality software is not.

The situation could change in the near future. "Real" word processing software may soon be available because, as Wohl put it, "the market for personal computers in the business environment is now large enough that it makes sense to invest the money in writing good software."

There is certainly no lack of quantity when it comes to word processing packages for micros. A chart done by *Infoworld* newspaper lists no less than 43 packages available for major machines.

Compromised Packages

According to Wohl, the problem is that packages are compromised, either in richness of function, meaning they lack depth of features, or in terms of the interface, meaning they are not user-friendly. She made it clear that even the best micro word processing package is at best comparable to an average dedicated word processor package.

Wohl warned against using low-cost proprietary packages such as those offered by Apple Computer, Inc. and Radio Shack, saying they are "not very good." They are basically designed for personal letter writing and not professional office applications, she noted.

Wohl said there are three specific areas to look for when acquiring word processing software for personal computers: training and documentation aids, adequate basic function, ease of use and appropriateness for desired applications.

There should be training help in the form of a menu backed by tutorial software. Adequate basic function includes such items as convenient insertion, deletion and rearrangement of text. For instance, users should check to see if it is necessary to use three keystrokes or one to perform a basic and frequently used function.

Most micro packages are also limited in their ability to handle lengthy, over 10-page, documents, Wohl pointed out. "You need more help when you're editing long documents," she said. "You want the system to do more of that work for you."

Separate packages for text editing and list processing is another problem. She commented that handling a name and address list merged with a letter becomes "fairly complex."

The office automation consultant uses Wordstar from Micropro International Corp. on her IBM Personal Computer and Xerox Corp. 820 micro. She was hesitant to say it is the best product, stating only that it is the most appropriate for her individual needs.

Wordstar runs on personal computers from IBM, North Star Computers, Inc., Zenith Data Systems, Inc. and Apple using the CP/M operating system from Digital Research, Inc. Wohl put the package in perspective by saying that even though it is among the best for micros, it was designed to handle only a limited set of office applications.

A new Wordstar user requires between half a day and a full day to learn how to get on the system, write a document and print it out. However, to become skilled with the package, it takes "at least several weeks of fairly extensive use, and you would probably want to use the system for a period after that to practice," she said.

Users should be prepared to pay around $200 for a good package under most circumstances. Volume buyers of the Xerox 820 may be able to obtain the software for around $5/edition, but Wohl detailed the potential danger in the volume approach.

A hardware vendor may go to a successful software vendor and buy 100,000 copies of a word processing package at $5/copy. The hardware vendor then passes the $5 cost on to the buyer through an increased hardware price.

"But in order for that to happen, they have to find a software package where it makes sense for the software vendor to make the deal," Wohl declared.

"May I point out to you that the better the package, the less incentive the software vendor has to to make that kind of a deal," she said.

Oasys Users Get Enhancements, IBM Link, Printer

BOULDER, Colo. — NBI, Inc. has introduced two IBM 3270 communications products, a laser printer and software enhancements for its family of office automation products.

The Office Automation System (Oasys) product family will now be able to communicate interactively with IBM mainframe computers by emulating IBM's 3270 products series. IBM 3270 Binary Synchronous Communications (BSC) is available for the Oasys 3000/S for $900, and 3270 Systems Network Architecture/Synchronous Data Link Control for the Oasys 64 series, which will be available in September, costs $2,500, plus $500 for the software license fee.

The Oasys Laser for the Oasys 64 offers printing speeds of 12 page/min and can use up to four different type fonts on one page. It will be available in July for $19,900, plus an Oasys 64 interface for $1,500.

Among the software enhancements now available are a spelling-error detection and correction package for the Oasys 64 for $900. An electronic bulletin board for the Oasys 8 and Oasys 64 requires the asynchronous/BSC option, which is priced at $2,500.

More information on these products is available from NBI through P.O. Box 9001, Boulder, Colo. 80301.

Workstation, 46M-Byte Winnie Bow for Hinet Local-Area Net

OAKLAND, Calif. — Digital Microsystems has unwrapped two enhancements for its Hinet local-area network: an integrated Zilog, Inc. Z80-based workstation with a 12-in. CRT and a 46M-byte Winchester master station.

The DMS-1280 workstation reportedly offers a detachable keyboard, 64K bytes of random-access memory, a 500K bit/sec RS-422 network port and a 9,600 bit/sec RS-232 printer port. The DMS-3/103 46M-byte master station is said to double the available formatted Winchester disk capacity.

Hinet is a packet-switched network based on the Digital Research, Inc. CP/M operating system and said to provide 500K bit/sec serial data transmission with the IBM Synchronous Data Link Control protocol.

The DMS-1280 workstation is available for $1,695; the DMS-3/103 master station costs $11,990 from Digital Microsystems, 1755 Embarcadero, Oakland, Calif. 94606.

DEC Dot Matrix Printer Debuts

MAYNARD, Mass. — Digital Equipment Corp. has introduced a dot matrix printer for its Rainbow 100, Decmate II and Professional 300 series of personal computers.

The Letterprinter 100 is said to feature letter-quality characters, bit-map output, standard tractors and integral multifont capability.

The printer operates at 240 char./sec in draft mode and 30 char./sec in letter-quality mode, a vendor spokesman said.

When in graphics mode, printing densities range from 133 by 72 dot/in. to 330 by 72 dot/in., depending on terminal aspect ratio desired, the vendor spokesman said.

The Letterprint 100 printer is priced at $2,690.

Additional information on the unit can be obtained from DEC, located at 146 Main St., Maynard, Mass. 01754.

Fax Transceivers Announced

MOONACHIE, N.J. — Sanyo Business Systems Corp. has introduced two facsimile transceivers.

The digital Sanfax (SF) 825 is said to be compatible with all other facsimile machines and able to transmit documents in as little as 20 seconds.

The SF 825 features automatic answer, automatic speed/mode selection and automatic paper cutting.

The SF 355 analog unit — for low-volume users — is compatible with CCITT Groups I, II and six-minute standards.

The SF 825 costs $7,500, plus a $100 installation fee and $600/year for service. Monthly rentals are $220 on a three-year lease, including service and maintenance.

The SF 355 costs $4,500 with the same installation and service charges. Rental on a three-year lease costs $125/mo, according to the vendor.

Sanyo Business Systems is located at 51 Joseph St., Moonachie, N.J. 07074.

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In addition to the tutorials and applications stories on integrating micros, you'll read a round-up story on the top ten microcomputer manufacturers, a key story on what kinds of software work best in integrating micros into the corporate environment, a close look at costs involved — and — a survey article on the numbers: What's currently installed and who's got the most machines out there. This article will be based on the most current desktop computer research from International Data Corporation, the world's largest computer industry research firm.

If you use, plan to use or need micros in your organization, you must not miss this March 28 Special Report in *Computerworld*. This one issue will give you the answers you need to serve your users.

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R&D Center Helps Forge New Heritage

By Bill Laberis
CW Staff

SCHENECTADY, N.Y. — Parallel rows of towering elms, few of which remain in the Northeast, line the main entrance to General Electric Co.'s Research and Development Center. The trees have been carefully preserved and stand as one of several other reminders of GE's past here, where the company began nearly a century ago.

But inside the sprawling complex, 2,100 workers, including 450 Ph.D holders, labor on futuristic projects. Many projects support new GE businesses or others not yet in the company fold — businesses that have little in common with the company's smokestack heritage.

GE is, in fact, a $30 billion, broadly diversified conglomerate undergoing a strategic metamorphosis (see story right). The company's ongoing portfolio changes have a distinct high-technology flavor, and a glimmer of future directions and corporate strategies can be seen in some of the re-

(Continued on Page 56)

GE Looks to High Tech

What to Do With $5 Billion?

By Bill Laberis
CW Staff

What will General Electric Co. do with its $5 billion cash hoard, a strong penchant for acquiring high-technology companies and, in the words of its chairman, a goal of becoming positioned at the leading edge of high-technology products?

One thing appears likely: despite some recent speculation, GE will probably not get back into the mainframe computer business it hastily abandoned in 1971. Said one industry analyst, "GE blew a golden opportunity in that market and is not about to risk getting burned all over again."

But the company's acquisition and start-up record in the past two years and the recent pronouncements of GE Chairman John F. Welch Jr. clearly indicate that GE is moving away from its traditional business toward diversification with a high-technology accent.

As one GE executive said, "People came to look at us as a balance-sheet, stodgy and conservative kind of behemoth, especially when we dumped the computer business. The directions we're going in now, such as in software, microprocessor development and factory automation, will bear this out beyond a doubt."

GE's R&D Center

Interest in GE's acquisition direction was heightened last month, when the company announced intentions to shed its Utah International, Inc. mining operation for $2.4 billion in cash. This, combined with another $2.6 billion in cash and marketable securities on hand at the end of 1982, will give GE a huge sum to fatten and diversify its portfolio of the 225-plus businesses it controls.

Since 1981, GE has spent $1 billion to purchase partial or total interest in 117 companies. Meanwhile, the company shed 71 businesses, mostly in heavy industry, netting $541 million, the executive said.

Outright acquisitions included Calma Corp., a computer-aided design and manufacturing firm, for $170 million, and Intersil Microelectronics, Inc., a microchip maker, for $235 million.

General Electric Information Services Co. (Geisco), GE's processing service subsidiary, at the same time has gobbled up several software companies, including Software International Corp.

"There's no question (that) GE's long-term orientation is to get into, or I should say back into, the high-tech business," said Michael Geran, an analyst with E.F. Hutton & Co.

Geran, who said GE "knows it made a big mistake in getting out of the computer business," speculated that the company will be "very niche-oriented." He said he looks for further software acquisitions, largely to support an expansion of Geisco's offerings, as well as invest-

(Continued on Page 56)

R&D Called Chip Makers' Lifeblood

By Robert Batt
CW West Coast Bureau

If research and development is the lifeblood of an industry, then for many semiconductor manufacturers the next few years will result in either a resurgence in health or a relapse from which recovery will be very difficult.

With the industry suffering from squeezed profit margins due to a prolonged recession and with the costs of R&D steadily increasing, several industry observers feel the chip producers will have to come up with more effective ways of funding product innovations.

"Technology is becoming ever more complex. As a result, research itself and cost of equipment and instruments necessary to carry out research are increasing tremendously," explained Erich Bloch, vice-president, technology personnel development at IBM.

CW Photo by B. Laberis

Erich Block

Bloch, who is also chairman of the Semiconductor Research Cooperative (SRC), a subsidiary of the Semiconductor Industry Association, asserted that manufacturers will be drawn increasingly more into cooperative efforts as the cost of R&D becomes too burdensome for a company to bear alone.

The purpose of the SRC is to increase the level of research in the semiconductor industry by

(Continued on Page 60)

HP Reorganizes Operations

PALO ALTO, Calif. — In a move designed to strengthen channels of customer interaction and improve strategic focus for its computer operations, Hewlett-Packard Co. has reorganized computer activities along lines reflecting five principal responsibilities.

HP's five groups include:

- Computer Products, responsible for development and manufacture of CPUs, operating software, languages and advanced microcircuitry.
- Information Products, responsible for development and manufacture of system peripherals, data communications products, data base resources, print centers and the software to combine these with systems and workstations to form information networks.
- Personal Computer, responsible for development and manufacture of workstations, personal computers and various other personal computation products.
- Computer Marketing, responsible for sales, field marketing, maintenance services and applications support for all HP computer products in all markets.
- Business Development, responsible for market development and merchandising of HP systems, workstations, networks and applications software as a set of solution systems for each of the company's major markets.

Vendor Eyes 'Steals' at Show, Finds own Stolen Hardware

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — An estimated $14,000 worth of stolen hardware unexpectedly resurfaced here late last month when its owner happened to notice the equipment on display in a competitor's trade-show booth.

The hardware had vanished from Hawthorne, Calif.-based Jade Computer Products, Inc. nine months ago only to reappear suddenly in a product exhibit at Digital Research, Inc.'s first CP/M '83 conference.

The exhibit belonged to a local firm, Itat Associates, Inc., which on Jan. 21-23 was showcasing its wares practically in the shadow of another product booth rented by Jade, also an exhibitor at the same show.

After spotting his company's stolen goods late during the final day of the conference, Jade owner Scott Anderson called local police, who briefly detained Itat chief Willis Lowe and seized $14,000 worth of Itat-displayed hardware.

Lowe was later released after he furnished police with receipts showing his firm had bought at least some of the equipment in question from a local distributor known as the Alfred Gee Liquidation Co. Although police are continuing to investigate the case, no charges have yet been filed against Lowe or any of his Itat associates.

(Continued on Page 62)

GE Forges Diversified Future From Tradition

(Continued from Page 55)

search carried out at the R&D center.

Of the 917 patents granted to GE in 1981, 227 originated at the R&D center (compared with 504 companywide at IBM). And of the company's $1.7 billion research budget in 1982, approximately $180 million supported center activities, a figure increasing rapidly, according to a company spokesman.

Last October, GE completed a three-year, $130 million expansion program at the R&D center, adding 440,000 square feet to its existing facilities. Included in this expansion was a microelectronics unit and computer science laboratory. According to James F. Welch Jr., GE's chairman, the microchip research facility was designed to "let us apply the tremendous potential of the microelectronic chip to every possible product, service and process, including the advanced automation systems needed to revitalize U.S. industry."

Kirby G. Vosburgh, manager of the silicon processing laboratory at the center, said of the company's chip R&D efforts, "GE had been on a buy vs. a build path for the last 10 years. Now with what we're doing here, we'll turn that around."

Most of the research conducted in the laboratory will support the work of Intersil, Inc., the microchip maker acquired by GE in 1981 for $235 million.

Vosburgh said that GE is not destined to compete with other chip makers in the low-end chip market, noting that, "GE is a systems company, so we try to sell systems of high margins rather than components of low margins." He suggested that GE will likely strive to transfer chip technology into embedded systems in its product and service offerings.

Philip M. Lewis, manager of the center's computer science branch, agreed with Vosburgh, saying that GE will concentrate its chip research energies on making special-purpose chips "with huge capabilities" and specific applications in robotics and computer-aided design.

Arthur Chen, manager of the center's information systems laboratory, said there has been a significant push within his group to develop industrial applications of artificial intelligence (AI). His laboratory is also experimenting with the use of AI as a training tool.

Chen said that about 35% of the work done in the information systems laboratory is pure or exploratory research, such as in formulating a high-level, functional language for VLSI-based systems or in experimentation to devise fully integrated local networks for voice, data and video communications.

Where Is GE Going?

(Continued from Page 55)

ments to strengthen its position in communications and intelligent robots.

But as to the possible acquisition of a mainframer, Geran said, "It is very clear this will not happen."

Jack Hart, industry analyst at International Data Corp., said that GE will not be in the market for a mainframe manufacturer acquisition.

Hart guessed that GE will concentrate a portion of its cash hoard on telecommunications acquisitions, but speculated further that the company could possibly jump into the already-crowded personal computer market.

"GE has fabulous distribution channels for that sort of thing already in place," Hart said."

In the meantime, no one, including GE, is ruling out the possibility of a major multibillion dollar acquisition.

"We want to be number one or two in each of our worldwide businesses," a GE spokesman said, echoing the sentiments of Chairman Welch.

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IBM Seen Narrowing Competitors' Horizons

By Robert Batt
CW West Coast Bureau

PALO ALTO, Calif. — IBM's increased market aggressiveness is forcing noncompatible competitors to narrow their market horizons, with many of them now adopting a bunker mentality.

This is the dominant view of several industry analysts interviewed recently. The market domination of IBM, they claimed, means there are very few companies with the resources to compete with Big Blue except in a few selected areas.

According to industry sources, IBM's recent rampage to gain market advantage will force many of its competitors to choose more narrowly than they might have which sector of the industry they want to tackle and to concentrate on gaining a market share in that area.

"To compete successfully in an increasingly tough industry, companies will need a good installed base in one area or another, understand to what extent they are mature organizations or not and look to the future to see what products they need to have in place," said Dan Rubin, management consultant at SRI International, Inc.

Noncompatible Vendors

Nowhere, the analysts asserted, has this become more apparent than in the increasingly rough-and-tumble world of non-IBM-compatible vendors such as Burroughs Corp., Honeywell, Inc. and Sperry Univac.

"These companies cannot challenge the resources of IBM when it comes to marketing across the board. They just don't have the muscle to do it and so they are gravitating toward some kind of niche strategy, and in that niche they can still be strong," explained Frank Petro, vice-president of information technology at Arthur D. Little, Inc.

For example, he suggested, Burroughs may concentrate on the banking sector, where it has traditionally enjoyed a competitive advantage.

The problem, Petro said, is that a number of users have switched to IBM from non-IBM-compatible vendors in order to ensure software compatibility of their products.

According to Gene Amdahl, chairman of Trilogy Systems Corp., companies such as Burroughs and Honeywell cannot compete against IBM's marketing channels. Their only chance of success, he asserted, is to develop technology to such an extent that it is too expensive for users to switch to IBM. "The user community can clearly see IBM pumping products into the marketplace at a rate that cannot possibly be matched by other non-plug-compatible mainframe suppliers. Up until now we have had one big monopoly and a set of minimonopolies. The strategy of companies such as Burroughs and Honeywell is to lock their users in economically. They will fight desperately against architectural compatibility of their products because then users would have no reason to stay with them," he added.

However, the industry consensus is that, while facing an uphill struggle, IBM's noncompatible competitors have some factors in their favor.

Joseph Francini, president of Information Solutions, Inc. and a former vice-president at Litton Industries, sees the users' need for stability as a major plus in competing against a more rugged IBM.

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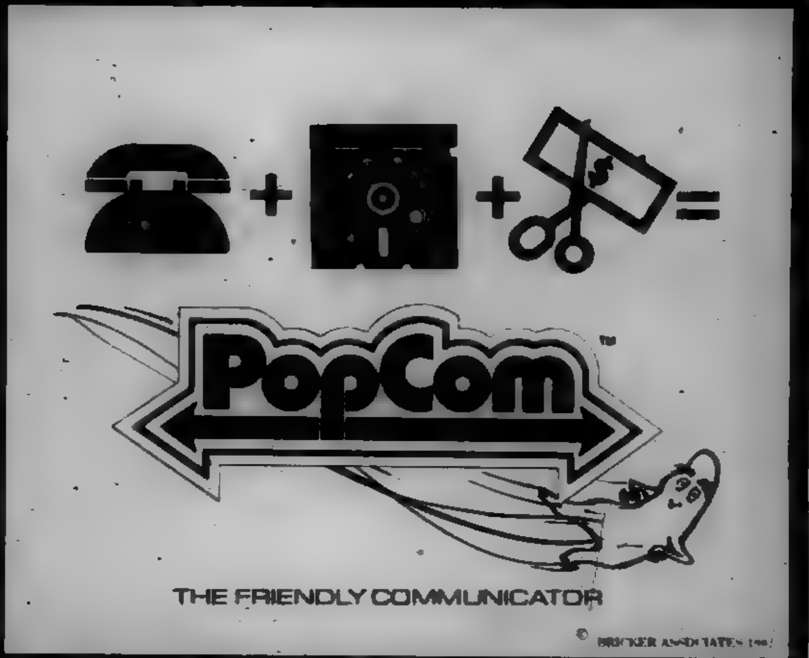

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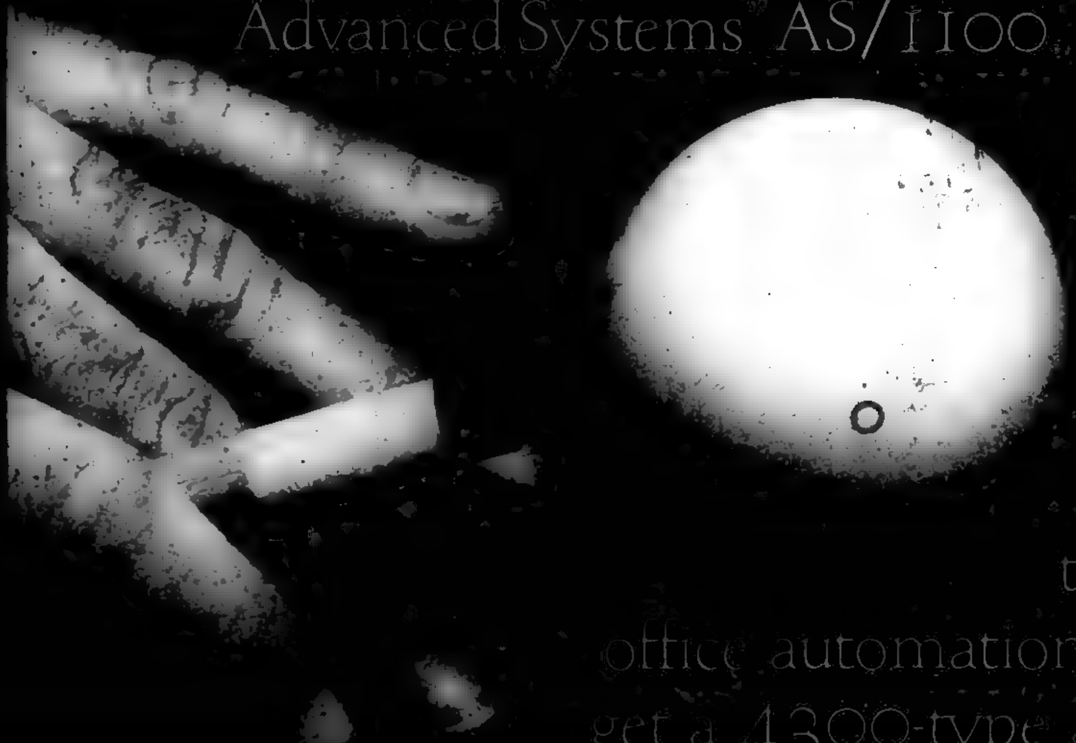

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STC Earnings Show Decline of 21% Over 1981

LOUISVILLE, Colo. — Citing the cost of field repair work to correct disk drive problems, Storage Technology Corp. (STC) has reported lower earnings of $64.7 million or $1.88 per share for 1982, a decline of 21% over 1981's earnings. Earnings in the fourth quarter plummeted 75% to $8.1 million or 25 cents per share.

Revenues for the year were up 17% to $1.07 billion, compared with $921 million in 1981, while revenues in the fourth quarter were up 1% over the same period a year before.

According to Jesse I. Aweida, STC chairman, the company "experienced field problems with certain disk data storage products . . . involving the replacement of major subassemblies in certain drives." The cost of replacement and reworking was more than $17 million.

Aweida added that the 8380 disk drive, designed to compete with the IBM 3380, is under final test with initial shipments to begin in March.

AMS Settles ADL/Delphi Suit

ARLINGTON, Va. — American Management Systems, Inc. (AMS) announced it has settled litigation between itself and Arthur D. Little, Inc. (ADL) and ADL's second-tier subsidiary, Delphi Associates, Inc., and will pay Delphi $700,000 upon formal dismissal of the suit.

The litigation, initiated in 1979, arose out of a project that Delphi was to perform for the state of Illinois, with AMS working as a subcontractor. Originally, AMS had sought $5 million in claims against ADL and Delphi, while Delphi filed a $7 million counterclaim against AMS, according to AMS.

But a U.S. magistrate issued a memorandum several months ago containing recommendations against AMS's claim in favor of Delphi, AMS said.

Chip Makers' Future Seen Dependent on R&D Funding

(Continued from Page 55)

stimulating and sponsoring R&D efforts in universities. But, according to Bloch; private industry alone cannot generate the funds needed to finance developments in semiconductor technology.

"The industry has been severely underfunded, and federal cutbacks in research and development are something we can ill afford. There is a strong case to be made for more government funding in science and technology research," he added.

In the meantime, chip manufacturers are exploring a variety of ways in which they can get more value out of their R&D dollars. At Advanced Micro Devices, Inc. (AMD), for example, the company has entered into a 10-year cross-licensing arrangement with Intel Corp. in which both companies gain access to certain sections of the other's technology and act as a second source to each other's products in those areas.

AMD last year spent about 16% of annual revenues on R&D. This year that figure is expected to grow to 18%.

"The lifeblood of our company is its products," an AMD spokesman said. "At the same time, the [product] life cycle is shorter than it once was. The days when you could introduce a product and have the market to yourself for 18 months are gone."

AMD and nine other companies have formed the Microelectronics and Computer Technology Corp. Its purpose is to give the participants more research ammunition to battle the semiconductor market threat posed by the Japanese.

But in a recent speech to the Semiconductor Equipment Manufacturers Institute, Glenn Penisten, chief executive officer of American Microsystems, Inc., asserted: "Investments like those made by the UK government in Inmos, Exxon Corp. in Zilog, Inc., UTC in Mostek Corp., Schlumberger in Fairchild Camera and Instrument Corp. and Philips, N.V. with Signetics Corp. probably won't continue."

At the same time, the capital-intensive nature of the semiconductor business makes it imperative that chip manufacturers have access to what Charles Lecht, president of Lecht Sciences, Inc., called a "significant, built-in and collaborating marketplace for their output." IBM's recent purchase of 12% of Intel's stock is an example of such an effort, he said.

Given recent industry initiatives, it is clear that several companies are striving to enlist such collaboration. According to Bill O'Neill, electronics consultant at Arthur D. Little, Inc. in San Francisco, "While giants like Intel, Motorola, Inc. and Texas Instruments, Inc. will remain, there may well be a shakeout of the smaller guys."

DP Industry Seeks Exemption

GAO: Repeal Service Contract Act

WASHINGTON, D.C. — The General Accounting Office (GAO) has recommended that Congress repeal the Service Contract Act, a law in which minimum wage provisions for federal contractors has long been opposed by the DP industry.

Providers of federal DP and equipment maintenance services have been seeking an exemption from the act, originally intended to protect blue-collar workers from wage-busting practices of employers seeking government contracts. The exemption, proposed by the U.S. Department of Labor in late 1981, has been delayed but is near finalization, according to the Computer and Business Equipment Manufacturers Association, which has led the fight against the law.

Looking at the act in its entirety, the GAO concluded Congress should consider repealing it because the government has not been able to administer it effectively, the wage rates set under it are generally inflationary and, in the GAO's view, other laws and regulations already adequately protect services workers.

Cray Posts 5% Earnings Increase

MINNEAPOLIS — Cray Research, Inc. announced a 5% earnings increase for 1982, finishing the year with profits of $19 million or $1.38 per share, up from $18.2 million in 1981. Revenues for the year were up 39% to $141 million. Fourth-quarter earnings were up nearly 50% to $12 million, or 87 cents per share, and revenues for the quarter rose 52% to $62.7 million.

John A. Rollwagen, company chairman, attributed the sluggish growth to several factors, including a decision to reduce the price of the Cray 1/S computer, as well as higher than anticipated engineering and development costs of the Cray-2.

TI Earnings Up 33% in '82, Revenues Up 3%

DALLAS — Texas Instruments, Inc. has reported a 33% gain in profits for 1982, with earnings rising to $144 million or $6.10 per share. Revenues for the year were up 3% to $4.3 billion, a gain the company attributed to increases in sales of government electronics and home computers.

As a result of research and development credits taken in accordance with the Economic Recovery Act of 1981, the company's effective tax rate was down nearly 6% to 32.4%, a spokesman said.

TI also reported fourth-quarter earnings of $42.6 million or $1.80 per share, up 16% from the same quarter in 1981, and fourth-quarter revenues of $1.1 billion, up 6%.

Revenues from semiconductor sales were essentially flat for the year, despite increases in unit sales, reflecting the stiff international price competition in that area. The semiconductor market, TI officials said, continues to suffer from excess capacity, sluggish demand and price erosion.

Motorola Nets Revenue Gain

SCHAUMBERG, Ill. — The financial results in 1982 at Motorola, Inc. were similar to those at many other companies operating in virtually all segments of the computer industry: revenues up, profits down.

Annual earnings were pegged at $169 million or $4.64 per share, a 7% decline compared with 1981's $182 earnings mark. Revenues meanwhile rose 6% to $3.79 billion. Both earnings and revenues were up in the fourth quarter of 1982, the company reported.

Robert W. Galvin, chairman and chief executive officer, said that despite "a worldwide economic environment that continued to be difficult," the company was "able to nurture technological leadership."

Motorola's Semiconductor Products, Inc. reported level sales and declining profits, not unlike the results posted by the company's competitors throughout the semiconductor industry.

MSA Revenues Hit $101 Million in '82

ATLANTA — Management Science America, Inc. (MSA) has announced that its 1982 revenues topped the $100 million mark, reaching $101 million, a 38% increase over 1981's results. Earnings for the year increased 63% to nearly $9 million, or 62 cents per share.

MSA's pretax income showed an increase of 40%, with net income increasing more sharply due to a substantially lower tax rate, the result of investment tax credits and tax deferrals.

John P. Imlay Jr., company chairman and chief executive officer, said MSA's results surpassed projections, with the bulk of revenues and profits realized in the fourth quarter.

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Administration Backed at Gatt Hearing

Brock Launches Defense of Open Trade Policy

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — In the face of gathering protectionist sentiment in Congress, U.S. Ambassador William E. Brock recently went to Capitol Hill to launch the Reagan administration's defense of the 35-year-old American commitment to open international trade.

The occasion was a recent Senate Finance Committee hearing on U.S. participation in the General Agreement on Tariffs and Trade (Gatt), the 88-nation pact governing much of the world's commercial exchanges.

Gatt has been the object of heightened criticism in official U.S. circles since a November high-level Gatt meeting gave only lukewarm approval to an American plea to its trading partners to reemphasize their commitment to free trade and to refrain from imposing further trade barriers [CW, Nov. 22, Dec. 6].

Open Trade Defended

Despite the assault on U.S. industrial competitiveness worldwide, the Reagan White House remains a firm defender of open trade. Brock urged Congress to disregard American "Cassandras" who would prescribe increased U.S. trade barriers to correct the problems of various American industries, such as auto manufacturing, suffering from competition from foreign imports.

The U.S. electronics industry in general supports the position of Brock, the chief White House advisor and spokesman on trade issues. The industry would like the administration to fight harder to reduce barriers overseas, particularly in Japan, to American imports. Industry spokesman have further expressed fears that American protectionist measures designed to bolster other U.S. industries would lead to increased barriers abroad to high-technology trade.

'A Beginning'

Referring specifically to high-technology and services trade, Brock acknowledged that the U.S. has had little success in introducing these important trade matters into the Gatt deliberations, which have so far been confined to trade in goods. But, he noted, the Gatt membership has agreed to take up services and high-technology trade, at least in a limited manner, which he described as "a beginning."

Warning against a "fortress mentality" that would lead to increased American protectionism, Brock said "the reality" is that U.S. commitment to free trade since World War II has made us economically much stronger and is "essential to our continued growth and strength."

"Trade policy has become the scapegoat for economic ills, not just in the United States but worldwide," he said. "Despite the outcry for protectionism in this country, our economic and trade data reveal that the [U.S.] has generally performed as well as our major industrial trading partners."

"Nations which protect their economies from adjustment today will pay by a decline in productivity tomorrow," he said. "Inevitably this means less economic growth, fewer jobs, a lower standard of living and more government intervention to divide up an even smaller economic pie."

Stolen Hardware Surfaces

(Continued from Page 55)

Not even Itat seriously disputes Anderson's claim that the property seized during the CP/M show was part of a $100,000 stockpile of equipment swiped last April from Jade's nearby Sunnyvale, Calif., office. The uncertainty arises over the question of whether Itat knew the hardware was stolen when the company bought it.

Itat denies ever having had any advance knowledge that the merchandise in its trade-show exhibit was loot from Jade's burglary. "We paid good money for that equipment and were selling it for a good price at a booth directly opposite from Jade's," according to Itat's attorney Alexander Anolik.

"I think it's highly unlikely we would have been so open about it if we had known the products were stolen," he said.

Local law enforcement authorities are unlikely to file charges against Lowe and his company unless Jade produces serial numbers showing that the goods in Itat's booth were among the items taken in last April's burglary. Jade has repeatedly indicated its willingness to make such serial numbers available, but thus far has failed to do so, according to local police Inspector Michael Wilcox.

Itat, meanwhile, has threatened civil action against both Jade and Alfred Gee, although litigation at this point is by no means a certainty, Anolik said.

Asked to comment on the recent developments involving Itat, Jade's Anderson expressed satisfaction and mild surprise that part of his company's stolen property was finally recovered. The loot, which is still in the hands of local police, includes random-access memory boards, Xerox Corp. processors and Novation, Inc. modems as well as Shugart Associates, Inc. Model 801 and 851 disk systems.

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June 20-24 .... Boston
Systems Design Workshop
March 14-18 .... Boston
March 28-April 1 .... Seattle
April 18-22 .... Texas
May 9-13 .... Philadelphia
May 23-27 .... Boston
June 6-10 .... New Jersey
Structured Programming: Techniques for Productivity
March 1-4 .... Texas
April 5-8 .... Boston
May 10-13 .... Boston
June 7-10 .... Philadelphia
Designing Systems Controls
March 28-30 .... Boston
DP Concepts for Non-DP Managers
March 10-11 .... Florida
April 18-19 .... Philadelphia
Screen Design
March 1-3 .... Boston
March 28-30 .... Philadelphia
April 11-13 .... Texas
May 9-11 .... Seattle
Project Management and Control
March 16-18 .... [illegible]
May 24-26 .... [illegible]
May 31-June 2 .... [illegible]
June 13-15 .... New Jersey [illegible]
June 14-16 .... Boston
Cost-Benefit Analysis for the Systems Professional
March 7-8 .... Seattle
Data Base Concepts & Systems
March 16-18 .... Philadelphia
April 13-14 .... Seattle
Data Analysis
March 7-8 .... Boston
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May 2-4 .... Boston
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Data Base Design
March 10-11 .... Boston
May 5-6 .... Boston
Data Communications Concepts & Systems
March 15-17 .... Philadelphia
April 12-14 .... New Jersey
May 3-5 .... Seattle
May 17-19 .... Texas
Teleprocessing Network Design
March 29-31 .... Boston
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CICS Command Level Programming
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April 11-15 .... Boston
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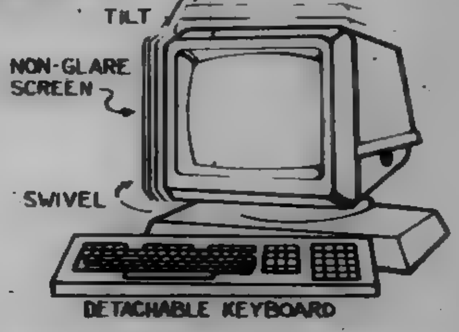

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And More Options

IBMer Says Micro Users Want 3270 Emulation

By Bruce Hoard
CW Staff

ARMONK, N.Y. — Large-account IBM Personal Computer users want IBM 3270 CRT terminal emulation. And there is "a lot of demand" for the Personal Computer to replace the 3270, according to Patrick Zilvitis, manager of Personal Computer marketing with IBM's National Accounts Division.

Zilvitis, whose division has responsibility for any customer buying more than 20 Personal Computers, discussed in a recent interview what Personal Computer users want, who the users are and how software is marketed for the micro.

There are three marketing channels for the Personal Computer, he said: authorized dealers such as Computerland, IBM product centers and the National Accounts Division, headed up by Zilvitis and catering to high-volume customers.

Users Want 3270 Emulation

IBM 3270 emulation is one of the most common requests made by high-volume users, he said. IBM is currently shipping a Synchronous Data Link Control (SDLC) card with 3270 emulation that allows the micro to "look" like a Systems Network Architecture (SNA)-compatible 3270 on-line and a Personal Computer off-line, he commented.

IBM recently introduced a Binary Synchronous Communications (BSC) protocol emulation for the micro to facilitate the huge installed base of BSC users.

Why was SDLC introduced first when there are so many BSC users? "I don't have a good answer for you," he said, adding that IBM is promoting SNA/SDLC because its user base is growing more rapidly than BSC's.

Lack of options is what Zilvitis construes as the Personal Computer's main weakness. "I would say the weaknesses, in a way, are really a set of product requirements," he stated, adding that users want an IBM-logo color monitor, a hard disk, higher resolution color and a letter-quality printer, none of which is currently available from the vendor.

At first, IBM angered independent software houses by refusing to let them accumulate over $100,000 in royalties for their packages. The vendor subsequently reversed that policy and Zilvitis estimated there are thousands of packages available.

They break down into "logoed" and "nonlogoed" products. Logoed software, such as Visicorp's Visicalc, has achieved "a high degree of acceptance" at IBM, he said, noting that there are about 50 logoed products.

"We have an applications software organization, which is really a business unit of IBM that has started to acquire nonlogoed software and make it available

(Continued on Page 66)

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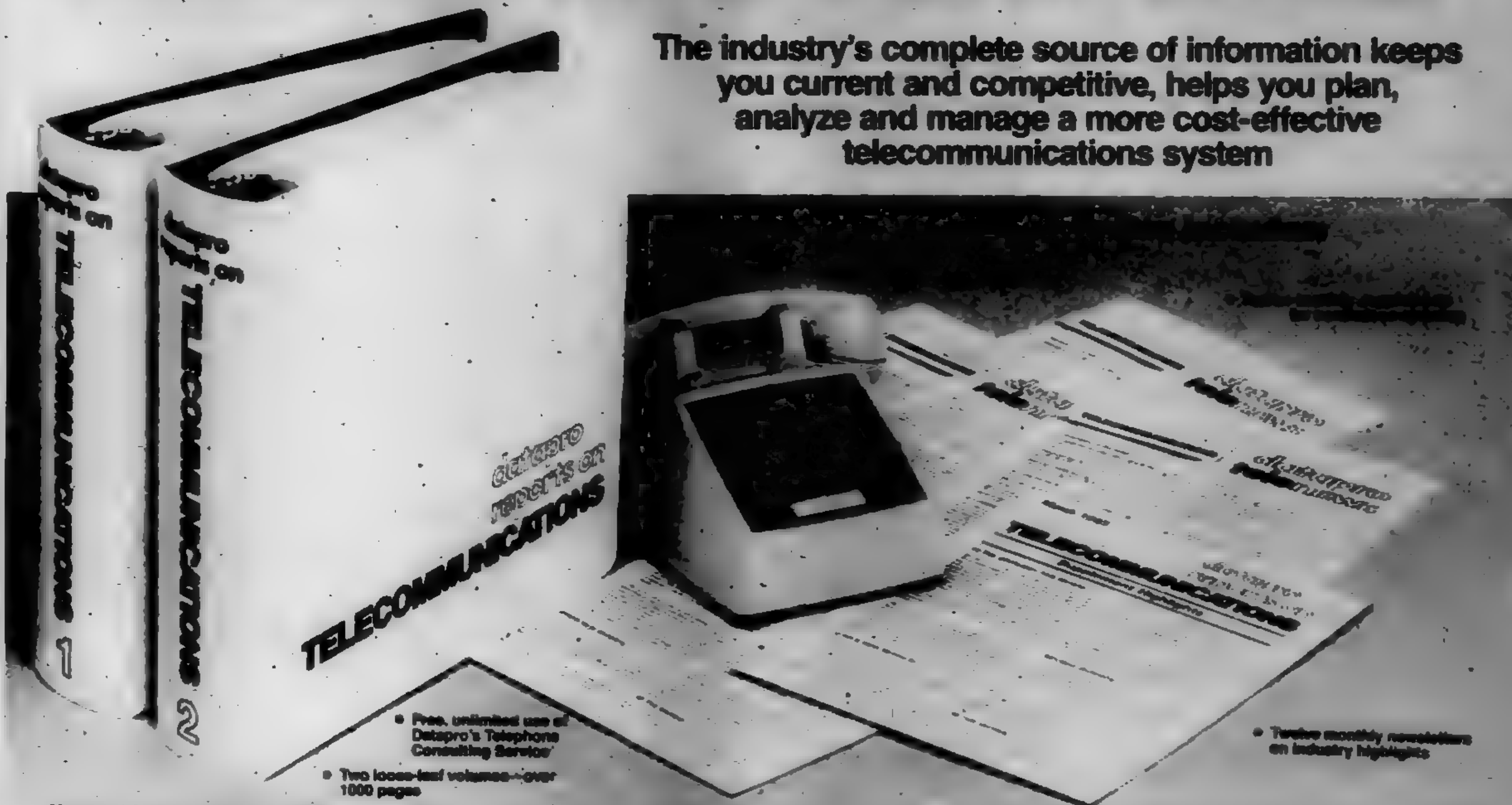

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Supershorts

Sevco, Inc. has donated a complete computer laboratory for student training to Marian High School of Framingham, Mass. A free lifetime service contract will be provided by Cosmic Enterprises, a Sevco affiliate.

* * *

Micro Peripherals, Inc. will market 3-in. flexible floppy disk drives to OEMs, becoming the first U.S company to do so, according to company Chairman Ralph Gabai.

* * *

Digital Equipment Corp. has signed an agreement with **Polygon Associates, Inc.** of St. Louis to market and distribute Polygon's communications software, Poly-XFR, a file-transfer package that allows DEC's CP/M-based personal computers to communicate with other DEC computer systems and with non-DEC personal computers.

* * *

Advanced Computer Management Corp. has become a distributor of **Harris Data Service, Inc.'s** financial applications software packages designed for the IBM System/34 and System/38.

* * *

Vector Graphics, Inc. has signed agreements to distribute **Taurus Software's** CP and **Innovative Software's** TIM III through its network of more than 450 independent dealers.

* * *

Hewlett-Packard Co. and **Lexico Enterprises, Inc.** have reached an agreement whereby Lexico will provide support and potential future enhancement for HP's Testaid/Fastrace software product. Lexico has been granted exclusive rights in the U.S. to offer Testaid/Fastrace training and has initiated expanded support services.

Digital Research, Inc. is sponsoring its first computer conference Jan. 21-23 at the Moscone Center in San Francisco for suppliers of software, hardware and related services for its standard CP/M operating systems. The three-day show will feature workshops, panels and seminars covering venture capital, software marketing and distribution, the future of microcomputer software and trends in operating systems.

* * *

The Microcomputer Software Association, a section of the Association of Data Processing Service Organizations, has elected its officers for 1983. They are: president, Donald Devine, group vice-president, Comshare, Inc.; vice-president, David Cole, chief executive officer, Ashton-Tate; and treasurer, Merrit Lutz, vice-president, software products group of Informatics General Corp.

* * *

Smoke Signal Broadcasting, Inc., Westlake Village, Calif., and **Medco Electronics, Ltd.**, Karachi, Pakistan, have formed a joint venture company, **Pakistan Computers, Ltd.**, to develop special customer-oriented software operating in the Urdu, Arabic and English languages. Medco Electronics will manufacture Smoke Signal's Chieftain computers and will market the hardware and software in Pakistan and the Middle East.

* * *

Victory Computer Systems, Inc. has received a license from **Exelan** to manufacture and incorporate Exelan's Ethernet-based front-end processor technology into the Victory Spirit and Factor microcomputers.

* * *

Nippon Telegraph and Telephone Corp. has selected three U.S. firms to supply equipment for Japan's telecommunications market. **Paradyne Corp.** will provide 9600 byte/sec modems, **Plantronics, Inc.** has been asked to supply prototype lightweight headsets and **AMP, Inc.** was selected to supply CCP cable connectors for field testing.

* * *

Datum, Inc. has expanded on-site service for its DSC 50 streaming subsystem through a third-party maintenance agreement signed with **DMC Systems, Inc.** of Santa Clara, Calif.

* * *

Mead Data Central, a division of Mead Corp., has been granted an exclusive license by the **New York Times Co.** to distribute data bases now produced by the New York Times Information Service, Inc. Mead Data will offer The New York Times On-Line, a full-text retrieval service; The Information Bank, which abstracts material from *The New York Times* and 60 other publications; and Advertising & Marketing Intelligence, a data base created by The Times Co. in association with J. Walter Thompson, which provides abstracts from 60 periodicals.

* * *

Varian Associates and **Digital Equipment Corp.** have developed an automated laboratory information management system as a result of a joint agreement signed last year. The new system will be introduced at the Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy in Atlantic City, N.J., March 7-12.

Large IBM Micro Users Seen Wanting 3270 Emulation

(Continued from Page 64)

through IBM marketing channels," Zilvitis explained. The packages are acquired on an "as is" basis, meaning IBM does not alter them.

"If a customer wants the Visicorp companion series to Visicalc, those are not IBM-logoed, but I have the ability to get them for a customer who wants to sign a volume purchase agreement," he commented.

Typical User

According to Zilvitis, the typical IBM Personal Computer user in a large commercial account is a "business professional," a first- or second-line manager who utilizes one of four applications software packages: electronic spreadsheet, business graphics, word processing and data base management.

Such users frequently link their Personal Computers to host systems. "What we are seeing is a very large growth in demand for connectivity between the Personal Computer workstation and host data processing machines," he said.

The marketing manager said the typical high-volume customer hardware configuration consists of two diskette drives, 64K bytes of memory, a monochrome display and line printer. There is a considerable demand for 320K-byte diskette drives, and "We have a lot of customers putting the asynchronous communications adapter card in the machine," he noted.

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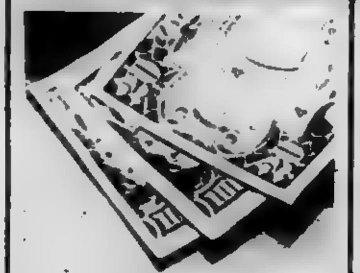

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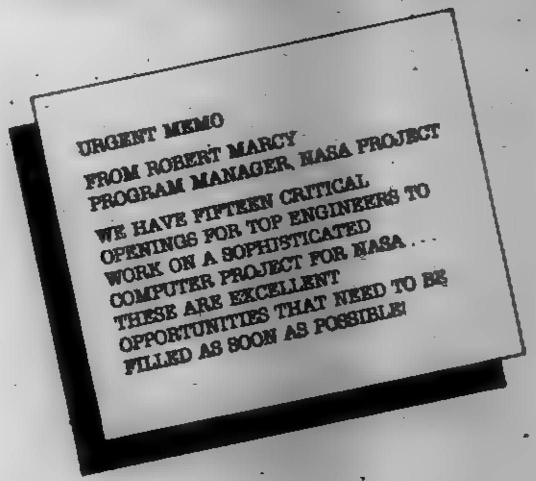

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Lead Systems Test and Integration Engineer

Requires a Bachelor's degree or equivalent experience, and 5-7 years' experience in distributed data processing, network control and high-speed data transfer. Working knowledge of hardware/software architecture, local-remote networking, long-haul communications links, and/or color graphics displays desirable.

Senior Test Engineers

Requires a Bachelor's degree or equivalent experience, plus 3-7 years' experience in systems test integration. Exposure to state-of-the-art computers and high-level languages is also required.

Positions are also available for Programmer Analysts with proven SIMSCRIPT II.5 experience.

We offer highly competitive salaries and a comprehensive benefits program. Apply by sending your resume to Professional Placement, General Electric Company, Western Systems, Dept. C21, 1277 Orleans Drive, Sunnyvale, CA 94086-1193. No phone calls please. We take pride in being an equal opportunity employer. U.S. citizenship required.

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Bechtel

Computer Professionals

San Francisco East Bay Area

Bechtel, a world leader in engineering and construction, has openings on a state-of-the-art (IBM 3033 & 3083) financial system development project. All positions are based in suburban Walnut Creek, California, just minutes away from San Francisco.

Database Design Supervisor

Duties: Participate in database design efforts for shared databases used by multiple applications.

Requirements: 7 to 10 years' data processing experience, including 2 plus years' supervising. 5 plus years' in creation of both logical and physical databse design (DL/1, prefer CICS environment). Experience with DB/DC/DD and structured analysis and design; familiarity with DB PROTOTYPE and SMU II.

Database Analysts

Duties: Create an integrated logical database design and subsequent physical database design, prepare documentation, train team members in use of DB/DC/DD and Data Designer.

Requirements: 5 to 7 years' data processing experience, including logical and physical database design, DL/1 (prefer CICS environment), DB/DC/DD, Data Designer, DB PROTOTYPE and SMU II.

Data Dictionary Support Analyst

Duties: Coordinate data dictionary reporting to users, install and test software used in support of data dictionary and database design, develop data dictionary utility programs, and set up and control mechanisms for generation of programming definitions (COPYLIB and JCL).

Requirements: 5 to 7 years' data processing experience, including 2 plus years' DB/DC/DD, programming on IBM 3033 and 370, and Mark IV or other report writers.

Data Security Analysts

Duties: Administer and maintain logical security rules for a production environment which includes DL/1 databases, OS and Mark IV datasets, and ACFII security package.

Requirements: 2 plus years' ACFII experience preferred, but will consider RACF. Demonstrated ability to translate user data security requirements into parameters used by internal control software required.

Software Configuration Analyst

Duties: Oversea Software Configuration environment and incorporate system efficiencies and enhancements.

Requirements: 4 plus years' IBM OS/VS or MVS, OS JCL, TSO/SPF, linkage editor and utilities required. Ability to design, code, and test programs in COBOL and/or PLI. Familiarity with Panvalet preferred,

IBM Systems Programmer/Technical Support

Duties: Provide technical support to programmers and analysts in the use of IBM operating systems and utilities. Develop standards and procedures for application development and configuration management.

Requirements: 5 plus years' application development experience (including dump reading) with MVS operating system using TSO/SPF and Panvalet. System generation knowledge with CICS and IMS/DB is a plus.

In addition to career growth, Bechtel offers competitive salaries, a liberal relocation policy, and an excellent benefits package, including a dental plan, medical and life insurance, and tuition refund.

For consideration of any of the above positions, rush your resume and salary history to:

Pat Mabutas
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Employment Dept. 46C-2
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San Francisco, CA 94119

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Software Development Engineers

Requires a BS degree in computer science, electrical engineering or mathematics. Your duties will include design, test and integration of real-time operational software with emphasis on modular and structured programming techniques. Experience in assembly language and PASCAL and or JOVIAL is desirable.

Systems Software Engineers

Requires a BS degree in computer science, electrical engineering or mathematics with experience in design and development of real-time programs in both assembly and higher order languages.

You will be responsible for the development of flight software for advanced guidance and control systems for aircraft. The software design will involve working with algorithms and subsequent integration with hardware.

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5 years experience in large scale IBM environment which includes IBM systems programming education.

Candidates must have in-depth experience with MVS/JES2 SP1.1 or 1.3 and preference will be given to applicants with current working knowledge of: ACF/NCP/VTAM R3, MSNF, TSO/SPF, VM/CMS, SAS, CICS, ADABAS, COMPLETE, OME, GAMON.

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MINIMUM QUALIFICATIONS: Bachelor's Degree in related field or equivalent experience. Three (3) years of programming and systems development experience with on-line systems. Additional background desired: working knowledge of COBOL or PL/1, OS. JCL, CICS, VM/CMS helpful. SALARY RANGE: $22,000 to negotiable. Send resume to:

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TANDEM systems experience preferred. Requires working knowledge of:

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Requires B.S. in EE or Computer Science with 5 plus years related experience.

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- Operating systems
- Data-base applications
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Requires TAL (a PASCAL type programming language) and MACRO-11 experience and 3 or more years in the field with a B.S. in EE, or Computer Science.

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PERKIN-ELMER 3230 or VAX 11/750 computer systems experience preferred. Real-time, Software Design, Development and Maintenance:

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Includes both Assembly and FORTRAN Language Applications. B.S. in EE, Math or Computer Science with 3 or more years experience required. Will also consider recent graduate with a high grade point average and one of the above stated degrees.

Software Test Engineers.

2 to 4 years in software systems testing plus enough software development experience for:

- Definition of test requirements
- Generation of test plans/procedures
- Test execution and reporting

B.S. in Computer Science or Math required.

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Emphasis on real-time distributed data acquisition/processing systems.

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  - PDL 81
  - SNA
  - FORTRAN
- VAX 11/750 to VAX 11/730 NETWORKS
  - DECnet
  - PDL
  - CMS
  - UNIX
  - FORTRAN

Should have a minimum of two or more years experience in VAX/VMS or PERKIN-ELMER operating system environments. Also requires a B.S. in EE, Math or Computer Science.

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Prefer 8 or more years technical experience.

Senior Software Engineers.

Must have ability to control network configurations to meet service level requirements. Requires experience in.

— VTAM/NCP. CICS and TSO in an MVS environment
— MVS/JES2 generation

Prefer 4 or more years technical experience

Senior Software Engineers

Will control all phases of data storage administration in an MVS environment and experience in:

— Data base installation, definition, and maintenance (IDMS or ADABAS)
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Prefer 4 plus years technical experience

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Develop a five year plan for division network communications, design and supervise the installation of data communications networks. Requires experience with communication hardware and protocols; familiarity with ISO and ANSI standards, including X.25; and knowledge of SNA, DECNET and PRIMENET systems/protocols including SDLC and DDCMP.

Fourth Generation Language Specialist

Establish Information Center Training. Experience in application development using End User Software Tools such as IFPS, FOCUS, TELL-A-GRAF, and SAS is required.

Sr. Programmer Analyst

Provide installation and maintenance of software for IBM (MVS), VAX (VMS), Honeywell (GECOS) and PRIME computer systems.

Sr. Systems Analysts

Perform systems analysis of sophisticated MRP systems. A programming background is mandatory.

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Provide division leadership in the selection, acquisition, and installation of Office Automation equipment including Word Processing, Personal Computing, and Graphics Systems.

Sr. Hardware/Software Engineer

Design and develop innovative microprocessor-based systems. A technical degree is required.

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USA TODAY

ANALYSTS/PROGRAMMERS PROJECT LEADERS FIELD SUPPORT

USA TODAY, the nations newspaper, has career opportunities for computer professionals interested in the start-up of a large IBM 4300 mainframe operation and a nationwide distributed DATAPOINT network.

IBM 4300 SYSTEMS

Candidates must have solid experience on IBM mainframe and a proven track record in developing interactive MIS applications. Experience with VM, CMS, COBOL, and RAMIS is strongly preferred. Experience in managing project groups a strong plus.

DATAPOINT SYSTEMS

Analyst/Programmer: Requires solid experience in DATAPOINT systems utilizing DATABUS.

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Software Developers

IBM Personal Computer and IBM 30XX/4300/370

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Senior level manager with microprocessor software products experience to specify and direct development of IBM PC-based modules. Should be familiar with languages and operating system choices for the IBM PC, as well as concepts of relational database management, non-procedural language, local area networks, and user-friendly software. Requires initiative, ability to manage, strong written and verbal communications skills.

• Microprocessor Software Developers

Design and build modular IBM PC-based software. Requires minimum of one year IBM PC experience with PASCAL and MS-DOS. Assembler experience is desirable. These positions require bright, energetic, creative people preferably with a recent degree in Computer Science.

IBM 30XX/4300 Mainframe

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• Software Developers (Strong PL/1)

5-6 years experience in PL/1 under MVS, VS1 or VM/CMS. Assembler experience is highly desirable.

• Software Developer (Strong Assembler)

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Degree or equivalent experience and at least 5 years experience in manufacturing and fiscal information systems, operating under DOS/VSE.

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Degree or equivalent experience and a minimum of 3-5 years with DOS/VSE and telecommunications software.

Please send a detailed resume indicating position(s) of interest and salary requirements to: Employment Department CW-2/21.
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Peer Services, Incorporated is a rapidly-growing, newly organized corporation founded by six major savings and loans. We are building a state-of-the-art IBM data center to provide financial software services to our parent organizations from our headquarters located in Dallas, Texas. Our environment includes IBM 3081, 3083, OS/MVS, JES 2, and IMS DB/DC. If you've been looking for that special groundfloor opportunity, consider us.

APPLICATIONS PROGRAMMERS
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SENIOR DATA BASE ANALYST

We are currently searching for a take charge individual who will be responsible for IMS data base administration including physical and logical data base design, call structure backup and recovery. Use and maintenance of data dictionary and data base design tools.

TANDEM SYSTEMS PROGRAMMERS

We are seeking several experienced TANDEM professionals to work at our Dallas development site in developing our multi-node Tandem Expand Network with locations across the United States. To qualify, you must have systems experience in TAL Pathway or GUARDIAN would be a plus.

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SYSTEMS PROGRAMMERS

- IBM 370, 30XX, 4341: solid background in internals of OS/MFT and OS/MVS. ALC skills essential and FORTRAN expertise very helpful.
- HONEYWELL 6000, 66, DPS-8: proven record in the internals of GCOS-III and/or GCOS-8, GMAP; also, GRTS-II internals and 355MAP.

APPLICATIONS PROGRAMMERS

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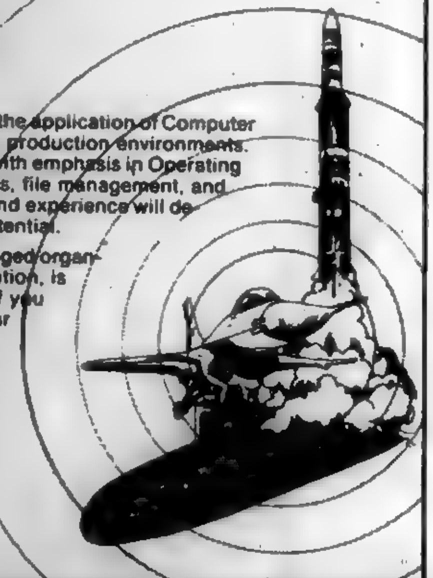

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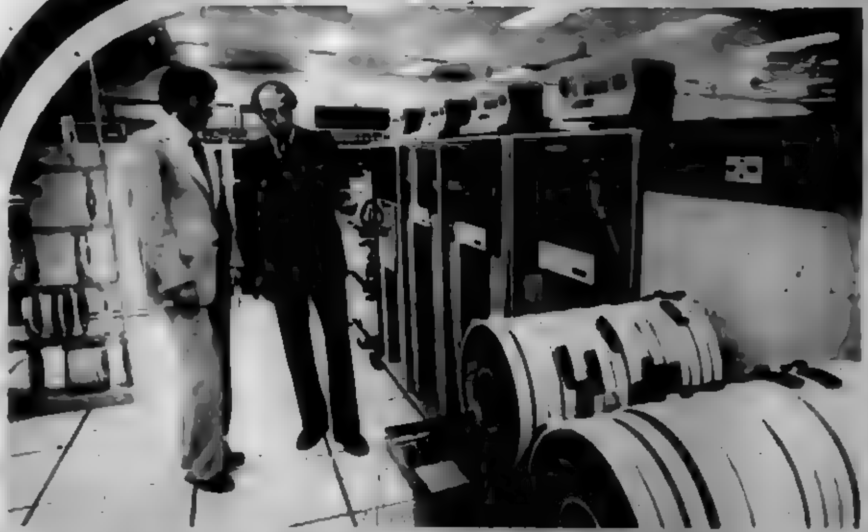

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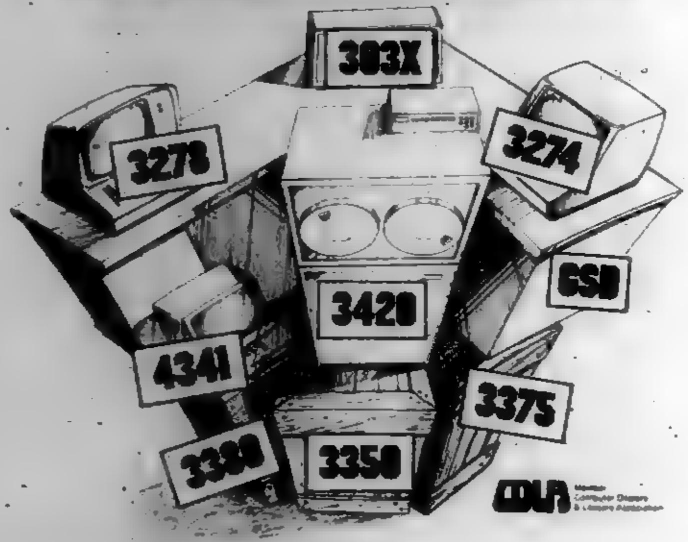

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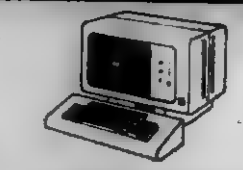

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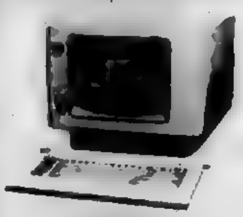

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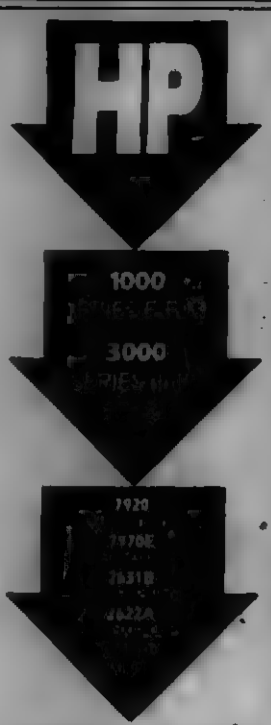

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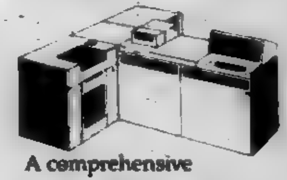

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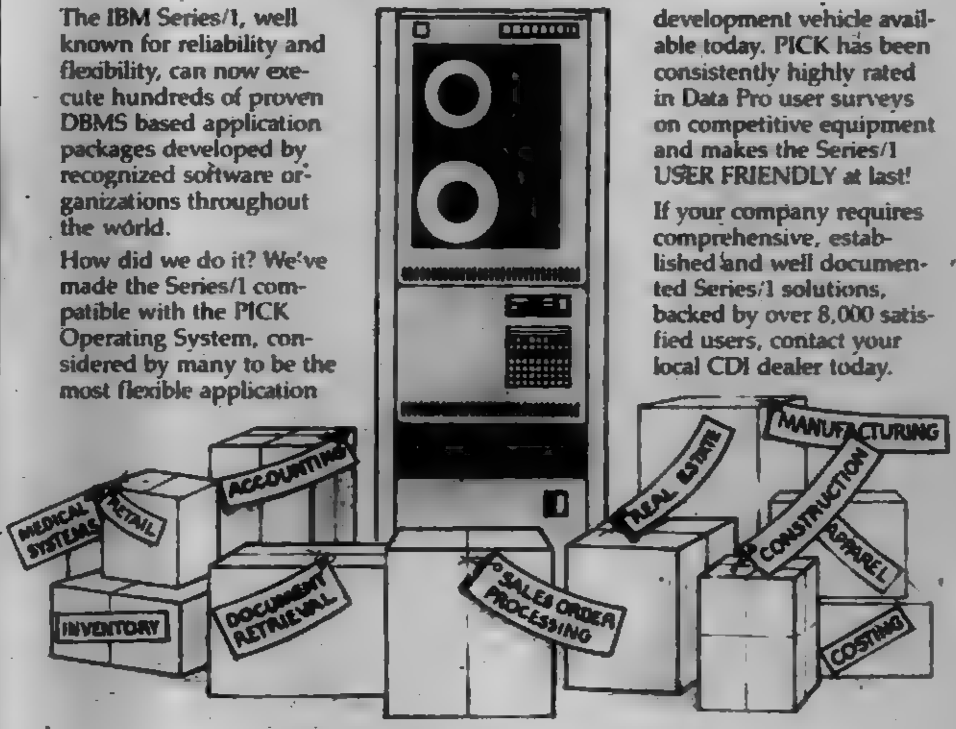

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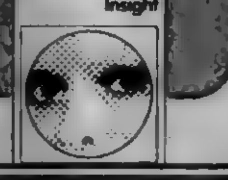

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M. Bryce & Associates 22

Cincom Systems 25
Circle Computer Services, Inc. 26
CMI Corp. 17
Codex Corp. 23
ComDesign 64
Commercial Programming 56
Computer Consoles 34-35
Computer Management Research 21
Computer Technology ID/4
Computerworld China 38
Computerworld Supplement 54
Compuware 36
Cord Cable Co. 43
Corodale 31
CRWTH Computer ID/10
CW On Communications ID/16
Cytrol 15

Dallas Market Center 11
Datapro Research 65
Datasphere 48
Deloit, Haskins, & Sells 4
Deltak, Inc. 10,32
Digital Equipment Corp.
—Micro 44-45
Digital Equipment Corp.
—TPG 49

EEC Systems 40,56
Essential Software 30

Four Phase Systems 19

Gejac, Inc. 64
General Systems 51

Halifax Engineering 56
Highlander Systems 32
Honeywell Information Systems ID/8-ID/9
Hughes Aircraft 30
H & W Computer Systems ID/13

IBM 46,50-51
Infodata 9
Innovation Data Processing 7
International Management Services 24
IPL Systems 42-43

J.W. Lampi 90
Lear Siegler 39
Lee Data Corp. ID/12
Library Journal 48
Local Data 40
Locom 19

MacKinney Systems 64
Madzar 40
Management Archetypes Corp. 64
Management Science America 92
Microterm 57
Mohawk Data Sciences ID/11,ID/13,ID/15
MPC 63

National Advanced Systems 58-59
NEC Information Systems 22

Omni Offices ID/14

Popcom 57
Phaze Information Machines 24
Prentice Hall, Inc. 56
Professional Computer Resource 14
Progressive Software 8
Protocol 15

QED Information Sciences 62

RD Labs, Inc. 40
Renex 38

SAS Institute 33
Signal Technology, Inc. 66
Software AG ID/5
Software Module ID/14
Sohio Petroleum ID/3
Storage Technology 27
Stratus Computer 12,52
Syncsort 3

Tab Products 16
Technology Transfer Institute 18
Teleprocessing Products 37
Televideo Systems 20-21
Tone Software 25

Ungermann-Bass 56
U.S. Postal Service ID/2

VM Software 37

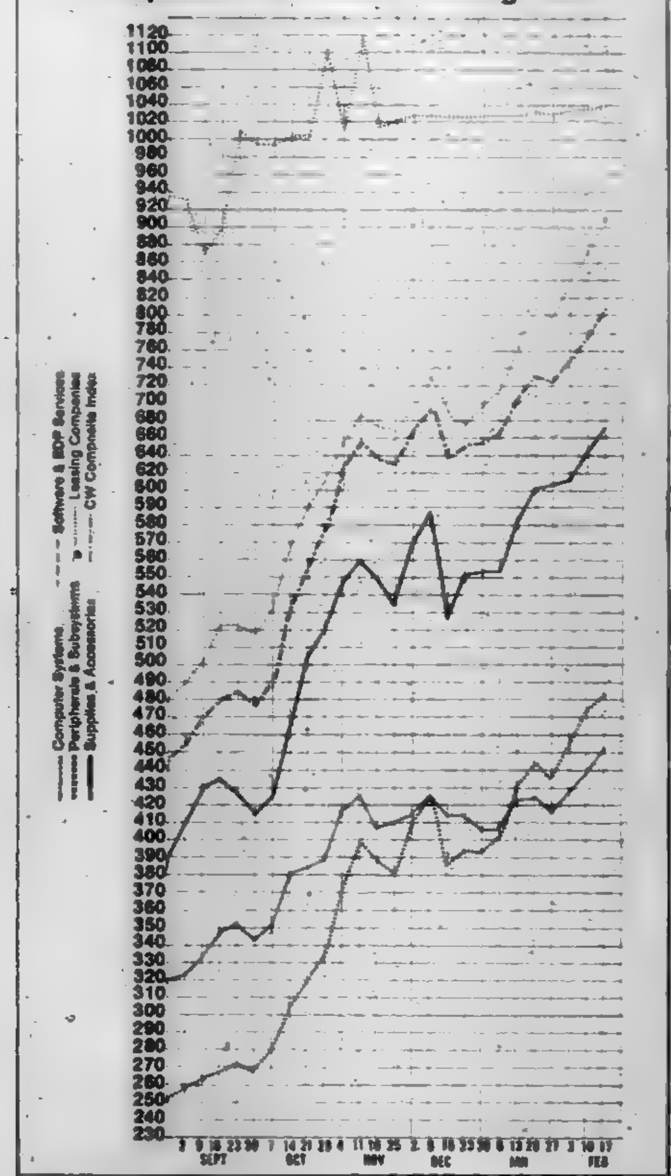
Wolfe Computer Services 36

Xerox Corp. 13,60-61

Yourdon 5

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Computerworld Stock Trading Index



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CLOSING PRICES WEDNESDAY, FEBRUARY 16, 1983

All statistics compiled, computed and formatted by TRADE QUOTES INC Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1982-83 RANGE (1)	CLOSE FEB 16 1983	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP	17- 44	40 5/8	+ 1/2	+1.2
N	BURROUGHS CORP	20- 49	46 1/2	+2 1/2	+5.6
O	COMPUTER AUTOMATION	7- 17	16	+ 1/2	+3.2
N	CONTROL DATA CORP	21- 48	47 1/2	+3 1/4	+7.3
N	CRAY RESEARCH INC	20- 48	46 3/4	- 5/8	-1.3
N	DATA GENERAL CORP	20- 58	53 7/8	+4 3/4	+9.6
N	DATAPOINT CORP	11- 34	23 1/2	+1 3/4	+8.0
N	DIGITAL EQUIPMENT	62-125	123 3/4	+7	+5.9
A	EECO INC	8- 12	11 3/8	+ 1/2	+4.9
A	ELECTRONIC ASSOC.	5- 12	10	- 1/8	-1.2
N	FLOATING POINT SYST	16- 35	34 3/4	+1 7/8	+5.7
N	FOXBORO	22- 42	41 7/8	+4 5/8	+12.4
O	FULCRUM COMP GRP	1- 3	1/4	0	0.0
O	GENERAL AUTOMATION	3- 8	6 7/8	- 1/2	-6.7
N	HARRIS CORP	20- 48	47 3/4	+4 1/2	+10.4
N	HEWLETT-PACKARD CO	36- 87	83 3/8	+2 3/8	+2.9
N	HONEYWELL INC	60-104	94 1/4	+5 5/8	+6.3
N	IBM	48-100	98 3/8	+3 7/8	+4.1
O	IPL SYSTEMS INC	5- 10	8 1/2	- 3/4	-8.1
O	MAGNUSON COMP SYSTS	2- 16	3	+ 5/8	+26.3
N	MANAGEMENT ASSIST	7- 18	16 7/8	+1 7/8	+12.5
O	MINI-COMPUTER SYST	1- 4	1/2	0	0.0
N	MODULAR COMPUTER SYS	6- 15	14 1/4	+ 3/8	+2.7
N	MOHAWK DATA SCI	10- 19	17	- 3/8	-2.1
N	NCR	28-104	102	+6 7/8	+7.2
N	PERKIN-ELMER	17- 33	30	-1 3/8	-4.3
N	PRIME COMPUTER INC	16- 45	44 1/4	+2 7/8	+6.9
N	SPERRY CORP	21- 38	38 1/2	+1	+2.6
O	TANDEM COMPUTERS INC	14- 34	28 3/4	+2 5/8	+10.0
N	TEXAS INSTRUMENTS	71-176	160 3/8	+8 3/8	+3.8
A	WANG LABS "B"	13- 36	36 3/8	+3 7/8	+11.9
A	WANG LABS "C"	11- 38	38 1/4	+3 1/8	+8.4

LEASING COMPANIES

EXCH		1982-83 RANGE (1)	CLOSE FEB 16 1983	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE FINANCIAL CP	22- 30	28 3/4	+ 1/4	+0.9
N	COMDISCO INC	13- 48	48 3/4	+4	+9.0
O	COMMERCE GROUP CORP	1- 1	1/4	0	0.0
O	COMPUTER INVSTRS GRP	1- 2	3/8	0	0.0
O	CONTINENTAL INFO SYS	5- 20	20	+2 1/4	+12.6
N	DPF INC	5- 13	11 1/2	- 1/2	-4.1
O	ITEL	1- 3	3/4	0	0.0
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	18- 41	40 1/8	0	0.0

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH; B=BOSTON
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
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EXCH		1982-83 RANGE (1)	CLOSE FEB 16 1983	WEEK NET CHNGE	WEEK PCT CHNGE
A	COMPUTER CONSOLES	15- 44	38 7/8	+1 3/4	+4.5
O	COMPUTER DEVICES INC	4- 21	14 5/8	- 3/4	-4.8
O	COMPUTER TRANSCEIVER	4- 8	8 1/4	- 3/4	-8.3
N	COMPUTERVISION CORP	18- 45	41 7/8	+ 5/8	+1.5
N	COMPAC CORP	21- 36	36	+2	+5.8
A	DATA ACCESS SYSTEMS	2- 3	1 1/8	0	0.0
A	DATAPRODUCTS CORP	16- 41	40 3/8	+4 3/8	+12.1
A	DATARAM CORP	5- 12	10 5/8	- 3/8	-3.4
O	DATUM INC	2- 10	9 1/8	+ 1/4	+2.8
O	DAVID JAMISON CARLYL	2- 7	4 1/4	- 1/2	-10.5
O	DECISION DATA COMPUT	3- 14	13 3/4	+ 3/8	+2.8
O	DELTA DATA SYSTEMS	1- 3	3	+ 1/4	+9.0
N	ELECTRONIC M & M	5- 8	6 7/8	+ 1/2	+7.8
O	EVANS & SUTHERLAND	18- 50	47 1/4	-2	-4.0
O	GANDALF TECHNOLOGIES	10- 22	16 1/8	+ 1/2	+3.1
N	GEN'L DATA COMM IND	8- 18	18 1/2	- 7/8	-5.0
O	GENERAL TERMINAL CP	0- 4	5/8	0	0.0
O	GREAT SOUTHWEST IND	2- 8	2 1/2	- 1/4	-9.0
N	HAZELTINE CORP	22- 56	51 1/2	+ 3/4	+1.4
O	ICOT CORP	3- 10	9 7/8	+ 1/4	+2.6
O	INFORMATION INTL INC	10- 22	20 1/4	+ 1/2	+2.5
O	INTEL CORP	21- 46	44 1/2	+ 1/4	+0.5
O	IPL SYSTEMS INC	5- 10	8 1/2	- 3/4	-8.1
A	LUNDY ELECTRONICS	7- 18	15 1/8	+ 3/8	+2.5
A	MSI DATA CORP	14- 36	20 5/8	-2 7/8	-12.2
O	NETWORK SYSTEMS CORP	19- 43	42 5/8	+3 3/4	+9.6
O	OMEX	3- 8	3	0	0.0
N	PARADYNE CORP	24- 91	90 1/2	+9 5/8	+12.9
A	PENRIL CORP	7- 12	10 5/8	- 1/8	-1.1
O	RAMTEK CORP	12- 28	25 3/4	+3 1/4	+14.4
N	RECOGNITION EQUIP	4- 13	12 1/8	+ 5/8	+5.4
O	SCAN DATA	1- 3	1 3/8	0	0.0
N	STORAGE TECHNOLOGY	18- 40	24	+1 3/4	+7.9
O	SYKES DATATRONICS	6- 34	15 3/4	-3 1/2	-20.5
A	T BAR INC	7- 16	13 1/8	+ 3/4	+6.0
A	TEC INC	4- 12	8 3/8	0	0.0
N	TEKTRONIX INC	34- 72	70 7/8	+ 5/8	+0.9
A	TELEX	3- 27	23 1/2	+2 3/8	+10.2
O	[illegible]DATA SYSTEMS CP	3- 10	8 5/8	+ 7/8	+11.2
A	TIMEPLEX INC	7- 26	21 3/8	+ 1/4	+1.1
O	VISUAL TECHNOLOGY	9- 19	18 1/4	+1 1/4	+7.3
O	WILTEK INC	1- 3	2	- 3/8	-15.7

SUPPLIES & ACCESSORIES

EXCH		1982-83 RANGE (1)	CLOSE FEB 16 1983	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMERICAN BUS PRODS	11- 21	20 1/2	+ 1/8	+0.6
O	BALTIMORE BUS FORMS	1- 2	1 1/4	0	0.0
N	BARRY WRIGHT	13- 24	23 3/4	+2 1/2	+11.7
O	CYBERMATICS INC	1- 1	1	0	0.0
A	DUPLEX PRODUCTS INC	12- 20	18 3/4	+ 1/2	+2.7
N	ENNIS BUS. FORMS	18- 30	27	+ 1/2	+1.8
N	3M COMPANY	48- 80	77	+ 3/4	+0.9
N	MOORE CORP LTD	28- 48	43 1/2	+1	+2.3
N	NASHUA CORP	9- 18	10 3/8	+ 1/8	+1.2
O	STANDARD REGISTER	32- 73	72	+7	+10.7
A	TAB PRODUCTS CO	12- 34	31 7/8	- 1/2	-1.5
N	WALLACE BUS FORMS	22- 53	53 3/8	+2 1/8	+4.1

SOFTWARE & EDP SERVICES

EXCH		1982-83 RANGE (1)	CLOSE FEB 16 1983	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 6	4	+ 1/2	+14.2
O	ADVANCED SYSTEMS INC	9- 23	23 1/4	+1 3/4	+8.1
O	AGS COMPUTERS INC	7- 21	19 1/2	- 3/4	-3.7
N	ANACOMP INC	9- 22	20 3/4	+1	+5.0
O	ANALYSTS INTL CORP	5- 9	8 3/4	- 1/4	-2.7
A	APPLIED DATA RES.	18- 44	42 1/2	-1 1/4	-2.8
O	ASK COMPUTER SYSTEMS	12- 35	34 1/8	+3 1/2	+11.4
O	ASTRADYNE COMP IND	1- 9	3 3/8	- 5/8	-10.2
N	AUTOMATIC DATA PROC	21- 38	35	+2 3/8	+7.2
O	CGA COMPUTER ASSOC	5- 14	12 1/2	+ 1/4	+2.0
O	COMPUTER ASSOC INT'L	12- 49	49	- 3/8	-1.6
O	COMPUTER HORIZONS	3- 12	11 5/8	+1 5/8	+16.2
O	COMPUTER NETWORK	4- 9	9 3/8	+1 3/8	+17.1
N	COMPUTER SCIENCES	11- 23	21 1/2	+ 1/2	+2.3
O	COMPUTER TASK GROUP	8- 18	17	+1	+6.2
O	COMPUTER USAGE	2- 16	15 1/4	+2 3/4	+22.0
O	COMPUTONE SYSTEMS	13- 38	37 1/4	0	0.0
O	COMSERV CORP	11- 20	17 3/4	+ 3/4	+4.4
O	COMSHARE	6- 17	14 1/2	+2 1/2	+27.7
N	CULLINET SOFTWARE	12- 35	32 3/4	+1	+3.1
O	CYCARE SYSTEMS INC	8- 18	15 7/8	+ 3/8	+2.4
O	DATA DIMENSIONS INC	1- 3	1/4	0	0.0
O	DATATAB	0- 1	7/8	0	0.0
O	DYATRON CORP	2- 4	3 1/2	+ 3/8	+12.0
N	ELECTRONIC DATA SYST	15- 50	34 5/8	+4 1/8	+8.1
O	INFORMATICS INC	10- 28	27 1/4	+2 3/4	+11.2
O	INSYTE CORP	1- 3	2 1/8	- 1/4	-10.9
O	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	4- 8	7 3/4	+ 3/4	+10.7
A	LOGICON	12- 24	21 1/2	- 5/8	-2.8
O	MGMT SCI AMER INC	8- 28	25 1/2	+1 1/4	+5.1
O	MATHEMATICA INC	12- 20	18	+1	+5.9
O	MATHEMATICAL APP GRP	12- 20	19 1/2	+1 1/2	[illegible]
O	NATIONAL DATA CORP	13- 28	21 3/4	+1 1/8	+5.4
O	PANSOPHIC SYSTEMS	8- 24	24 1/4	+1 1/2	+6.5
N	PLANNING RESEARCH	8- 19	14 3/4	+1 1/4	+9.2
O	PROGRAMMING & SYS	1- 4	3 3/8	0	0.0
O	REYNOLDS & REYNOLD	17- 38	38 1/8	+2 3/4	+7.7
O	SEI CORP	21- 54	43 1/2	+ 1/4	[illegible]
O	SHARED MEDICAL SYST	13- 28	28 1/4	+1 3/4	+6.2
O	SCIENTIFIC COMPUTERS	0- 13	11 3/4	- 1/2	-4.0
O	SOFTWARE AG	5- 17	11 1/8	0	0.0
O	TYMSHARE INC	12- 30	23 1/4	+ 7/8	+3.8
A	URS CORP	9- 16	10 3/8	+ 1/2	+4.7
N	WYLY CORP	7- 13	10 1/8	+ 1/2	+5.2

PERIPHERALS & SUBSYSTEMS

EXCH		1982-83 RANGE (1)	CLOSE FEB 16 1983	WEEK NET CHNGE	WEEK PCT CHNGE
N	AM INTERNATIONAL	1- 15	3 1/2	0	0.0
A	ANDERSON JACOBSON	8- 26	21	- 1/2	-2.3
O	AUTO-TROL TECHNOLOGY	8- 21	19	-1 1/8	-5.9
O	BANCTEC INC	7- 23	17 3/4	-1 1/4	-6.5
A	BEEHIVE INT'L	6- 10	9 3/4	+ 1/2	+5.4
A	BOLT-BERANEK & NEW	8- 40	38 3/8	+ 3/8	+0.9
O	CAMBEX CORP	2- 4	2 1/4	+ 1/4	+12.5
N	CENTRONICS DATA CORP	6- 18	17	+ 5/8	+3.8
A	CETEC CORP	4- 8	7 1/2	+ 1/8	+1.6
O	COGNITRONICS	3- 12	8 1/2	- 1/8	-1.2
O	COMPUTER COMMUN.	1- 2	3/8	0	0.0

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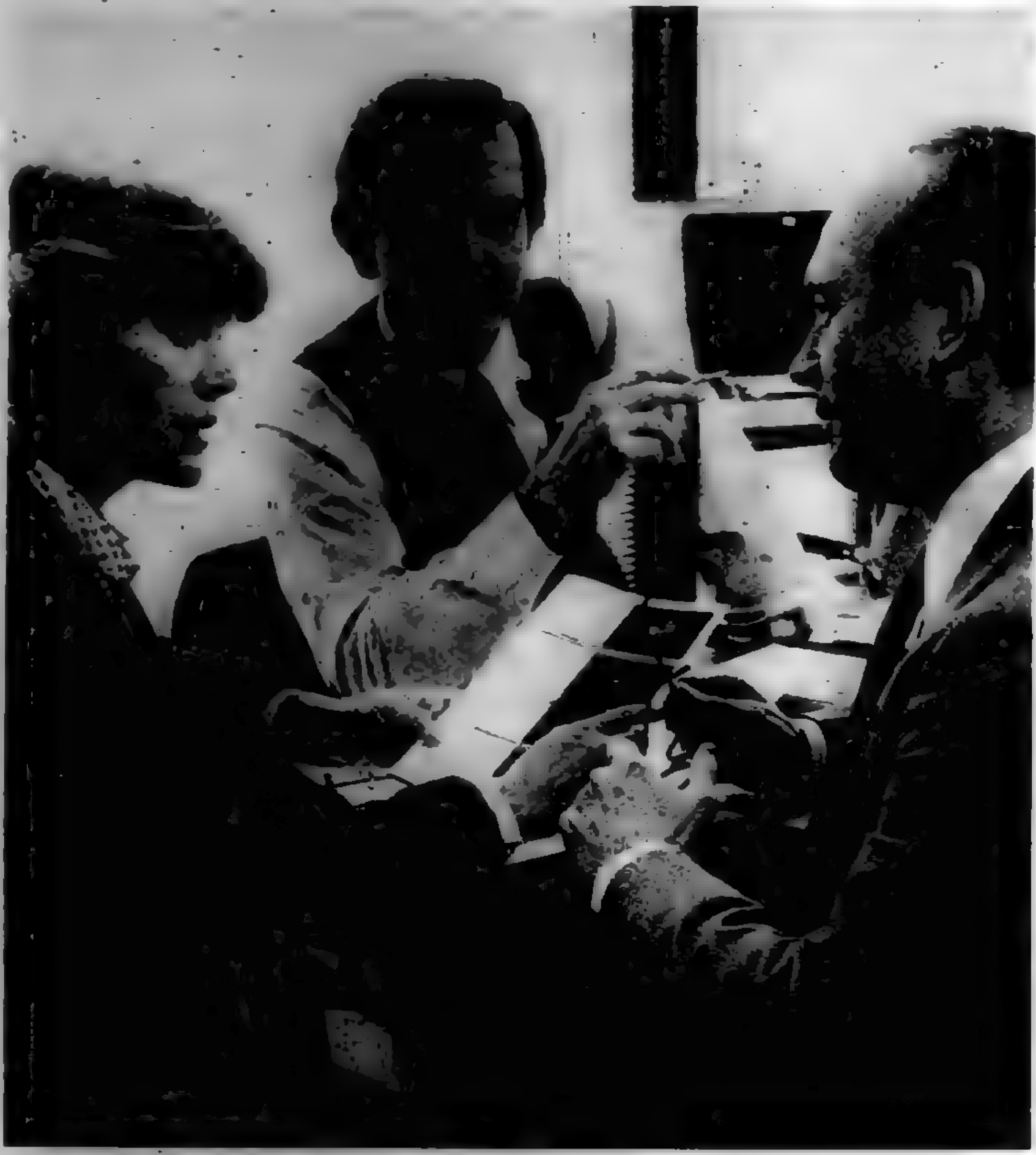

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CONTENTS

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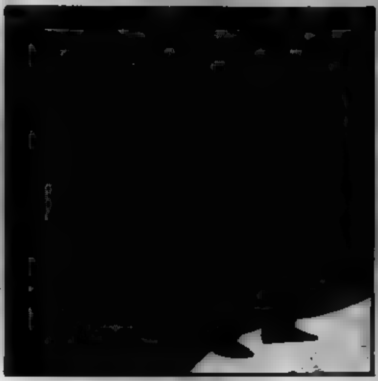

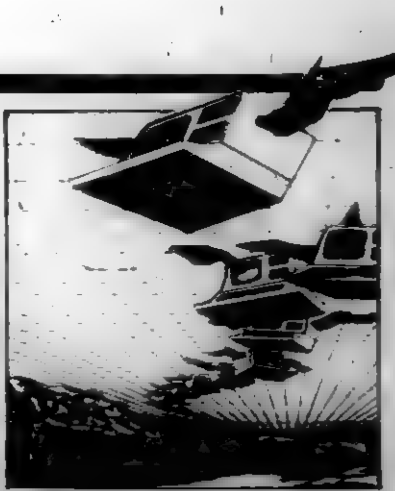

COMPUTERWORLD

OA

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9

WHO CONTROLS THE OA BUDGET?

By Thomas Elliott

A lot of money is being spent on office automation. Who is spending it and where is it going?

13

TAKING A LOOK AT DATA GENERAL

By Ann Dooley

Data General may have a fight on its hands in the OA marketplace. How much of a contender is it going to be?

16

SMOOTH SAILING

By Alan D. Mazursky

Once a computer would fill an entire office. Now mainframes are being elbowed out of the way to make room for personal computers. Here's what it means to users.

25

BEYOND WORD PROCESSING

By Amy D. Wohl

Word processing is a stock item in most organizations. Pick up some tips about migration paths into office automation.

31

IT'S A JUNGLE OUT THERE

By William Clarke

Do you ever go ape over the data jungle in your DP department? Information Centers may help your end users get into the swing of things.

35

THE NEW OFFICE: MORE THAN YOU BARGAINED FOR

By M. Lynne Marcus

Office automation can produce a vicious circle: increased office productivity may create dissatisfied employees, which leads to decreased productivity. Here's what to do.

OA FOCUS

45 - 72

In each issue, *Computerworld OA* will spotlight a new topic or technology to help you keep pace with the industry. The first focuses on planning office strategies.

46

PLAN!

By J.T. Monk and Kenneth Landis

DON'T PLAN!

By N. Dean Meyer

Pilot projects may be the solution at some sites while strategic planning may be the answer at others. How do you determine which is best for you?

55

SURVEY THE FIELD

By John M. McQuillan

What are other users doing about planning for OA. A survey of OA implementors illuminates some of their hard-learned knowledge.

61

DEVELOP NEW STRATEGIES

By Richard Dalton

The role of the MIS manager is evolving. What can you do to stay one jump ahead?

69

DON'T FORGET POLITICS

By Kate Barnes

Politics doesn't have to be dirty. When introducing automation into an organization, you may need all the friends you can get.

73

CHANGE IS INEVITABLE

By Philip J. Berg

People can always find excuses for not accepting automation. Here's how to recognize excuses and what to do about overcoming them.

77

DECISIONS, DECISIONS

By Thomas R. Mylott III

Buy now or wait for the next generation? Is leasing more cost-effective than purchasing the equipment outright? There are always a lot of questions when acquiring technology. Now find out some answers.

DEPARTMENTS

Comment 4
Reader Forum 5
Newsbriefs 6
Technology 81
Calendar 84

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COMMENT

It's a sad comment on the industry that users consider it an event when a computer is easy to use. It is not a criticism of Apple Computer, Inc.'s new Lisa personal computer to point out that most of the acclaim centered around its ease of use, not its applications technology.

Users should not have to feel grateful when a vendor offers a feature that should be a given. Similarly, businesses should not be put in the position of paying money for technology that strikes fear in the hearts of their secretaries as well as their chief executive officers. Apple made its mark catering to the "techie," yet it is one of the first vendors to concentrate on the user interface for the non-DP user. Other vendors should sit up and take notice. Vendors see the office market as ripe for picking. To date, however, many products they are offering — while adequate for a hard-core DPer — are difficult for non-DP users to learn and use. In many cases, novice users are being forced to sit at keyboards and type commands that are frequently incomprehensible and hard to remember. If the user wants to change from one application to another, he must stop work to change disks.

> ***"Businesses should not be put in the position of paying money for technology that strikes fear in the hearts of their secretaries as well as their chief executive officers."***

Unlike the computer aficionados, this audience is not interested in the technology per se, but only in what it can do. Can it improve organizational efficiency? Can it make the user's job easier? It doesn't matter how efficient a machine can make an organization in theory if users cannot be productive in practice.

The responsibility does not lie solely with vendors, however. Too many organizations perceive office automation as a quick-fix solution to their problems. Rather than analyze needs, work flow, employee working habits and working conditions, companies all too often plunk equipment on their employees' crowded desks or typewriter tables and then expect them to start being more productive. In the short term, it may be the employees who suffer; ultimately, it is the organization that gains nothing — and sometimes it loses a lot.

If OA is to make business more efficient and employees more productive, vendors will have to start at the beginning: making their equipment more efficient for end users. And implementors will have to realize equipment alone won't work miracles. Understanding user needs is the first step toward a successful technology.

LETTERS

More School Days

I found the article "School Days" [CWOA, Dec. 1, 1982] by Patricia Carrell to be most interesting. I have been involved in the training of WP secretaries and operators and have various viewpoints I would like to share with you.

"I want to learn word processing." This is a familiar refrain to many of us who have been in the field for years and are witnessing this upsurge in popularity of WP. The shift in training from vendors to other sources has given birth to a greater need to create training programs to meet this growing demand. This emergence of many training programs has created an open market for exploitation.

Word processing originally started as a concept and/or innovative system idea of office procedures. However, it is currently known to the layman as "those wonderful machines." The average individual is excited at the prospect of receiving high monetary rewards — which we know come only with experience. Not knowing what to look for in a training program, one goes to the one that is the quickest and least expensive — not necessarily the best.

The criteria for a good training program should include answers to the following questions:

- What other knowledge and skills does the training program offer? Does it offer English and communication skills, concepts and typing speed?
- How many machines do they have for instructional purposes? The answer will determine how much actual hands-on time the individual receives.
- What type of equipment is taught? Does the program cover microprocessors or word processors? Although in theory, storing and retrieving might be the same, practicality and keyboard language differ. Does the system offer transferable skills, or is it only through the use of a software program? Does the program keep up to date with current technology?
- What is the location of the equipment? Is it on the premises or off? Is the student learning and working for a company at the expense of the individual and the outside company?
- How is the use of the equipment taught? Is the atmosphere of the laboratory conducive to learning? Is there an instructor teaching on an individual basis or is it just tape instruction? What is the background of the instructor or the program coordinator? Does the program teach operator independence and the ability to troubleshoot?

A company looking for a knowledgeable operator should check to see that the training program provided the best instruction it could possibly offer. I agree with the point made in your article that proper facilities, manuals and assistance are all necessary parts of good training.

In-house instructors must learn to deal with the human aspects of training. Each student experiences a basic fear of learning, a loss of control, when he sits down at any system. Wherever the training takes place, whether in a vocational school or on the job, the student must feel at ease with the system. This is especially true of students who lack experience with system language and usage.

In most cases, I have found it necessary to implement my own training tools, such as technical and exercise manuals, visual aids and so on. It has been my experience that vendor-supplied material has not been geared toward the student and seems to assume a certain level of system knowledge. If training is to be geared toward the entry-level employee who does not have any system knowledge or experience, no knowledge should be assumed.

A properly trained operator is one who will need instruction only in the company's procedures and organization, not in the skills that should have been part of the training process itself.

Naomi R. Glaser
WP Training Director
American Business Institute
Of Brooklyn
Brooklyn, N.Y.

To Our Readers

Current *Computerworld* subscribers will continue to receive *Computerworld OA* this year as part of their subscription. Other readers who want to continue receiving the publication should subscribe to CW, using the bound-in envelope and subscription form located elsewhere in this issue.

We encourage readers to let us know their opinions, suggestions, problems and news of technological breakthroughs. Letters should be addressed to The Editor, Computerworld OA, 375 Cochituate Road, Rt. 30, Framingham, Mass. 01701

OA

READER FORUM

By Michael Goldman

It hasn't been a bed of roses . . . Oh, I wouldn't want to be without office automation. I still cringe when I visit other companies and watch secretaries type or managers file away daily tomes. But the transition hasn't been without its problems. Every office has its kinks, but an automated one can sometimes be like giving your teenage son your Porsche to go pick up girls: He's either going to get to old problems faster or amaze you with creative new ones.

Because of these new tools I have been called creative, responsive, overbearing, unavailable, too available, inhuman, warm and (my favorite) "still a technician at heart."

How did it all happen? A little at a time. Once my tube was installed, I felt it gave me license to make innovative changes to office operations. After five years, I have learned to categorize the nuances by their respective technology:

Electronic mail: Our system provides a function that allows follow-up answers to a user who has read an electronic note. This has resulted in a new language, which I refer to as "Replyspeak" — somewhat appropriate, when you consider the Orwellian effect of this environment. It works like this: Suppose you send a note to one of your peers to inform him of your correct phone number:

Me: It's X2476. Mike.

This is when Replyspeak kicks in.

Peer: Thank you.

Me: You're welcome.

Peer: Appreciated.

Me: It was nothing.

Peer: Really clears things up.

Me: Glad to have been of service.

Peer: And you were prompt too.

Me: You know me — everything on time

Peer: Oh yeah, what about the Freebish Project????

Including punctuation, the original message was 14 characters. But the net effect is that my coworker might as well forget my number, because I will now be out to him for the next three months.

When Replyspeak mixes with the "buck slip" function, life can get even more difficult. After I requested the installation of two telephones, I was sent a reply that they would be too costly and my request was denied. The message, from a building management clerk, came late in a particularly tough day. (At least that was an excuse I included in my follow-up apology.) Deciding it was time to flex my organizational muscle, I replied in capital letters, with no sentence greater than three words and with an excess of exclamation points.

Within microseconds, my message went from the clerk to her boss to my boss. I received a brand new note from the big guy. The last note was read on Saturday morning on my at-home terminal. I spent the rest of the weekend discussing with my wife the virtues of my becoming a househusband.

By the way, after forwarding a note of apology (long sentences, all in lowercase) describing to the clerk the pressures of a high-exposure job, two things happened. One, I got my phones and two, I am now known as the e.e. cummings of Replyspeak.

Decision support: I am genuinely amazed at the numerous ways I can alienate my secretary. At budget time no one likes anyone anyway. Budgets aren't difficult, but every number changed requires rows and columns to be added again. To request more than one change a day is to tread on dangerously thin ice.

I resolved that this year would be different! With the old programmer's blood rushing through my veins, in a few hours I created a budget data base and support software to produce extensive reports. All that was left was the data entry portion.

Once again I proved that, while programmers are born not made, analysts had better be the parents. The system was not ergonomically sound, user-friendly nor human engineered. After a few days and changes, my secretary felt very comfortable working with the data base. However, when I persisted in making changes before she did (and without telling her) I received notes from her — all in capitals, with no sentence longer than three words.

The machine that answers the phone: Through intense study, I have determined that people who dial only four digits expect to find a human being on the other end of the phone. Seven-digit people leave messages, but in-house people normally swear and hang up.

My department was clearly considered pretentious when I okayed the installation of this handy device. Once every hour we would dump the tape and find seven receiver clicks for every message left. Actually, this ratio points out a productivity gain. If it wasn't important enough to leave word, why was the call made? With this in mind, I would chuckle as people stopped me in the hall to tell me how much they hated that thing in my office.

Of course, some small problems did occur. Like the time I was traveling and needed to talk to one of my managers and all I got was that damn recording. (Now, when I go on trips, if I can't call early in the morning or right after lunch, I don't call at all.) There was also the time we forgot to dump the tape for three hours; the first message on it was from the security desk telling me that my guests had arrived, were seated in the lobby and I should send someone to get them.

Graphics: A picture is worth a thousand words. Not only was a terrific graphics device installed, but it has a 35mm camera attached to it. Presentations could now take on the characteristics of media events. No discussion was too small — all would be embellished with word slides and multicolored graphics representing the rise in waste paper baskets emptied or incompleted phone calls left on my answering service. I am now greeted in meetings with the same groans I get at home when I pull out pictures of my vacation.

Moreover, because we are a company with 3,000 employees and only three slide projectors, the following scenario is common: "And now, if you will hold up the third slide to the light, you will see profits have increased while we have maintained a level number of telephone operators."

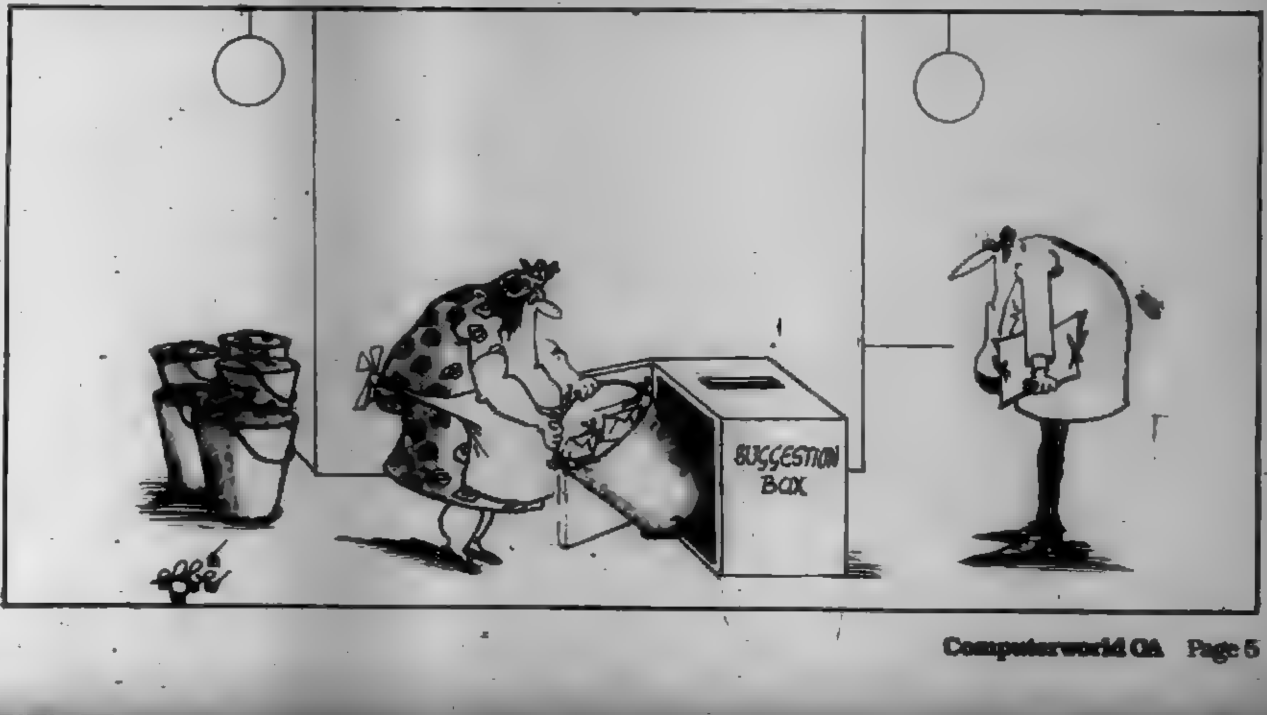
Word processing: Doing my own typing seemed like a real commitment to the advanced office. For years I plodded along, writing things out in long hand, then turning the whole cryptic mess over for typing. Not now. Now my ignorance of spelling, punctuation and verb tense are clearly displayed to all who receive my documents. I have since moved on to dictating equipment, which leaves my secretary to deal only with unfinished thoughts. As a result, my "writing" vocabulary has increased — I can now use words that in the past I found unspellable.

Interestingly, though, I still use word processing to type out sensitive memos. This way, memos of a confidential nature are neatly presented without involving typists and over-the-shoulder readers. Usually. There was the time, however, when as a catharsis I used a document to record my solution for all of the world's problems. The piece was rather lengthy and was written late at night. When I arrived at work the next morning, an apologetic office consultant informed me that one of my documents had been inadvertently overlaid, but they would strive to get it back for me. The rest of the day was spent with my telling them to forget it while the OA staff insisted that the only honorable thing to do was to restore it.

A consultant did get it restored and pledged she never read anything she brought back from the bit bucket. She also laughs a lot when she sees me now.

Other strange phenomena continue to occur. In spite of all these trials and birth pains, however, I still wouldn't trade my two terminals (one in the office, one at home) for the old ways. The value-added carried throughout this system far outweighs the occasional creative and innovative mistake. Secretaries complain about response time and executives wish that our financial packages could do just a little more. But they all agree life in the advanced office is more productive and satisfying — and even more fun. In the words of the famous philosopher A. Schwartzenegger, "No pain — no gain." OA

Goldman is the second vice-president and director of communications and information analysis at Lincoln National Corp.



OA NEWSBRIEFS

LOWELL, MASS. — DR. AN WANG, FOUNDER OF WANG LABORATORIES, INC., HAS APPOINTED JOHN F. CUNNINGHAM, FORMER EXECUTIVE VICE-PRESIDENT, AS HIS REPLACEMENT AS COMPANY PRESIDENT AND CHIEF OPERATING OFFICER. Wang will remain as chairman of the board and chief executive officer. Harry H.S. Chou, formerly executive vice-president, was promoted to vice-chairman of the board and will remain as chief financial officer and treasurer. Frederick A. Wang, Dr. Wang's son and formerly senior vice-president, was promoted to executive vice-president and chief development officer.

ARLINGTON, VA. — THE SITE OF THE 1984 NATIONAL COMPUTER CONFERENCE (NCC) HAS BEEN CHANGED FROM ITS HOUSTON LOCATION TO EITHER THE LAS VEGAS CONVENTION CENTER OR McCORMICK PLACE IN CHICAGO. The decision was made by the American Federation of Information Processing Societies, Inc. (Afips) after that organization received numerous complaints from vendors and attendees about inadequate facilities and accommodations. The 1983 NCC will be held May 16-19 in Anaheim, Calif., as planned.

PALO ALTO, CALIF. — THIRTEEN ELECTRONICS COMPANIES HAVE ENDORSED A SINGLE EMERGING STANDARD FOR LOCAL-AREA NETWORKS which will eventually allow computers and office equipment, regardless of brand, to communicate with each other. The new Institute of Electrical and Electronics Engineers (IEEE) P802.3 draft standard, Carrier Sense Multiple Access with Collision Detection (CSMA/CD), represents the convergence of IEEE 802 working drafts, Ethernet specifications and documents from the European Computer Manufacturers Association.

WILLOW GROVE, PA. — THE EXECUTIVE BOARD OF THE INTERNATIONAL INFORMATION/WORD PROCESSING ASSOCIATION (IWP) RECENTLY VOTED TO CHANGE THE ORGANIZATION'S NAME to the Association of Information Systems Professionals (Aisp). The name change is effective June 1, 1983, as part of an overall strategic five-year plan. The new name is intended to be a more accurate reflection of the professional expertise and aspirations of the group's membership as a whole. The association's purpose is to serve as the representative organization for users of information systems products and services and will "express the needs of those who design, implement, manage and use all information systems."

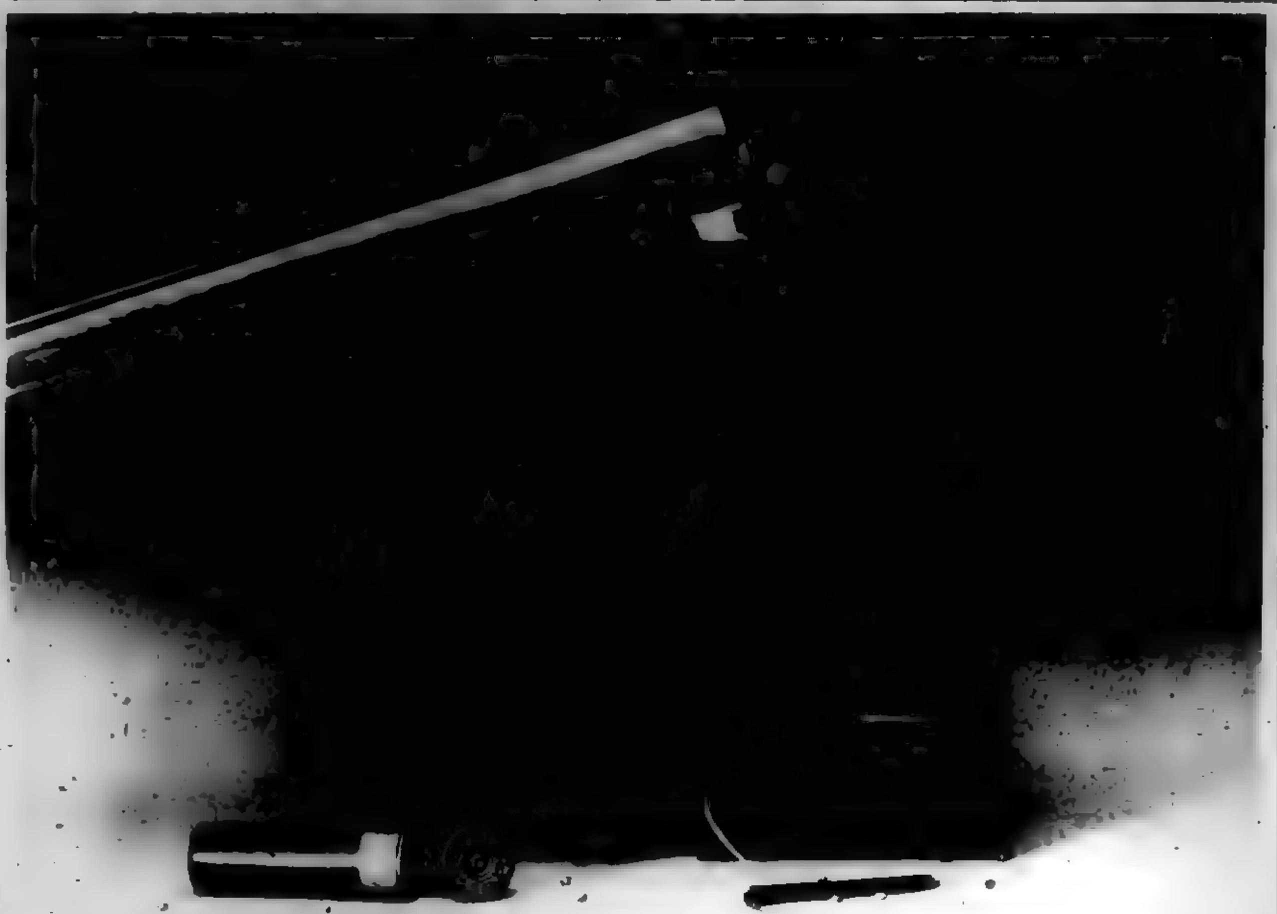
NORWALK, CONN. — THE SURGE IN BUSINESS/ PERSONAL COMPUTER REVENUES IS EXPECTED TO REACH ITS PEAK AND TAPER OFF TO EXTREMELY MODEST LEVELS BY 1992, according to a report by International Resource Development, Inc. (IRD). The 163-page document, "Vendor Strategies for Personal Computers/Workstations," predicts that by 1987 the personal computer market will begin to be absorbed by the multifunction workstation field. This workstation market will garner roughly $14 billion annually during the next 10 years, according to the study, with the workstation destined to "serve as a replacement for data terminals, word processors and personal computers, which will either become obsolete or move downward in the white-collar hierarchy." IRD is at 30 High St., Norwalk, Conn. 06851.

SILVER SPRING, MD. — THE NATIONAL MICROGRAPHICS ASSOCIATION (NMA) BOARD OF DIRECTORS WILL BALLOT ITS MEMBERSHIP FOR THE PURPOSE OF CHANGING THE GROUP'S NAME to the Association for Information and Image Management. At a recent meeting, the board concluded that the NMA must broaden its scope and promote micrographics as an integral part of the automated office and not remain as a stand-alone technology. The new name would be officially adopted on July 1, 1983, pending voter approval.

NEW YORK — THE WORLDWIDE VIDEOTEX/TELETEXT MARKET IS GROWING IN EXCESS OF 100% ANNUALLY, according to a recent study published by Link Resources, Inc. The report, "Worldwide Videotex/Teletext Evaluation," also concluded that on a global basis, Prestel-formatted systems still dominate the marketplace, with half of the public systems using Prestel-based coding schemes.

In computer hardware, half of all survey participants reported using Digital Equipment Corp. host machines. Banks were revealed to be the largest category of information providers in the world's videotex community.

FORT WORTH, TEXAS — TANDY CORP. WILL ACQUIRE THE ASSETS OF INTERCONNECT TELECOMMUNICATIONS SYSTEMS, INC. (ITS) OF LEXINGTON, KY., FOR AN UNDISCLOSED CASH SUM. It will reportedly be incorporated into the Radio Shack division of Tandy to broaden the scope of its tele-



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OA NEWSBRIEFS

phone product marketing. Radio Shack intends to open a series of experimental retail telephone stores in conjunction with its acquisition.

LOWELL, MASS. — WANG LABORATORIES, INC. HAS REACHED AN AGREEMENT IN PRINCIPLE WITH UNITED STATES SATELLITE SYSTEMS, INC. (Usssi) which calls for Wang to acquire both a minority ownership in and satellite transponder capabilities from Usssi. As a result, Wang's major accounts will reportedly be able to own or participate in their own national communications networks of Wang-based systems, complete with voice, data, video and text transmission capabilities. Under the agreement, Wang may purchase additional bandwidth from the New York-based Usssi in the future.

SCOTTS VALLEY, CALIF. — VICTOR TECHNOLOGIES, INC. ANNOUNCED THAT ITS PERSONAL COMPUTER HAS BEEN SELECTED BY FORD MOTOR CO. FOR USE THROUGHOUT THE CORPORATION. Ford is expected to purchase 1,500 to 3,000 Victor 9000 systems, most of which will go to Ford's Dearborn, Mich., headquarters. The Victor product has a single-unit base price of $3,995.

WELLESLEY, MASS. — THE PORTABLE BRIEFCASE COMPUTER AND TERMINAL INDUSTRY, WITH SHIPMENTS OF 265,000 UNITS IN 1982, WILL INCREASE SHIPMENT VOLUME 12 TIMES OVER THE NEXT FIVE YEARS, according to a study by Venture Development Corp. The fastest growing area in this industry, which encompasses portable display terminals, portable teleprinters and portable computers, is the rapidly emerging portable briefcase segment. This market is led by Osborne Computer Corp., which boasts a whopping 56.1% share of 1982 revenues. Venture is at One Washington St., Wellesley, Mass. 02181.

CINCINNATI — THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH) WILL EXAMINE THE RELATIONSHIP BETWEEN VIDEO DISPLAY TERMINALS AND PROBLEM PREGNANCIES AND BIRTH DEFECTS. The study has been prompted by a growing concern among women office workers. A team of Niosh researchers, led by Dr. Michael Rosenberg, will compare the rate of spontaneous abortions and birth defects among users and nonusers. The study will be the first large-scale epidemiological research that focuses on women using the terminals and will draw from records on 6,000 pregnancies.

PHILADELPHIA — THE FRANKLIN RESEARCH CENTER HAS ANNOUNCED THE DEVELOPMENT OF AN OFFICE OF THE FUTURE PLANNING MODEL to assist in evaluating the impact of OA technology on the productivity and lifestyle of professional and office employees. The computer model project, called Optimus, is a multiclient-sponsored venture that will reportedly help companies forecast and analyze the expense of equipment, software, training and facilities necessary to achieve OA objectives. The institute is at 20th and Race Station, Philadelphia, Pa. 19103.

WASHINGTON, D.C. — A MICROCOMPUTER SELECTION GUIDE FEATURING THE CHARACTERISTICS OF 47 MAJOR MICROCOMPUTERS HAS BEEN COMPILED here by the Office Automation Society, Inc. (Oasi). The reference guide reportedly includes information on word processors and various OA products, with charts, definitions and checklists to help match specific office needs. It costs $24 from Oasi through P.O. Box 31, Washington, D.C. 20044.

NORWALK, CONN. — RESTRUCTURING OF THE TELECOMMUNICATIONS INDUSTRY WILL RESULT IN "CONVULSIVE" CHANGES IN THE MARKET FOR TELECOMMUNICATIONS EQUIPMENT LEASING SERVICES, according to a research report from International Resource Development, Inc. (IRD) The study analyzes the expected impact of the AT&T Consent Decree and the Federal Communications Commission's Second Computer Inquiry decision and reviews the opportunities in telecommunications leasing for lessors, commercial banks, telephone companies and equipment manufacturers.

The report points out that leasing companies are already jumping into the telecommunications market, ready to displace some of the telephone companies' traditional leasing activity. IRD is at 20 High St., Norwalk, Conn. 06851.

HOUSTON — COMPAQ COMPUTER CORP. HAS ANNOUNCED THAT THE SEARS BUSINESS SYSTEMS CENTER CHAIN AND 10 OTHER COMPUTER RETAIL STORES WILL NOW SELL ITS COMPAQ PORTABLE COMPUTER. The 16-bit portable machine, intended for business and professional use, is reportedly plug-compatible with the IBM Personal Computer and its software.

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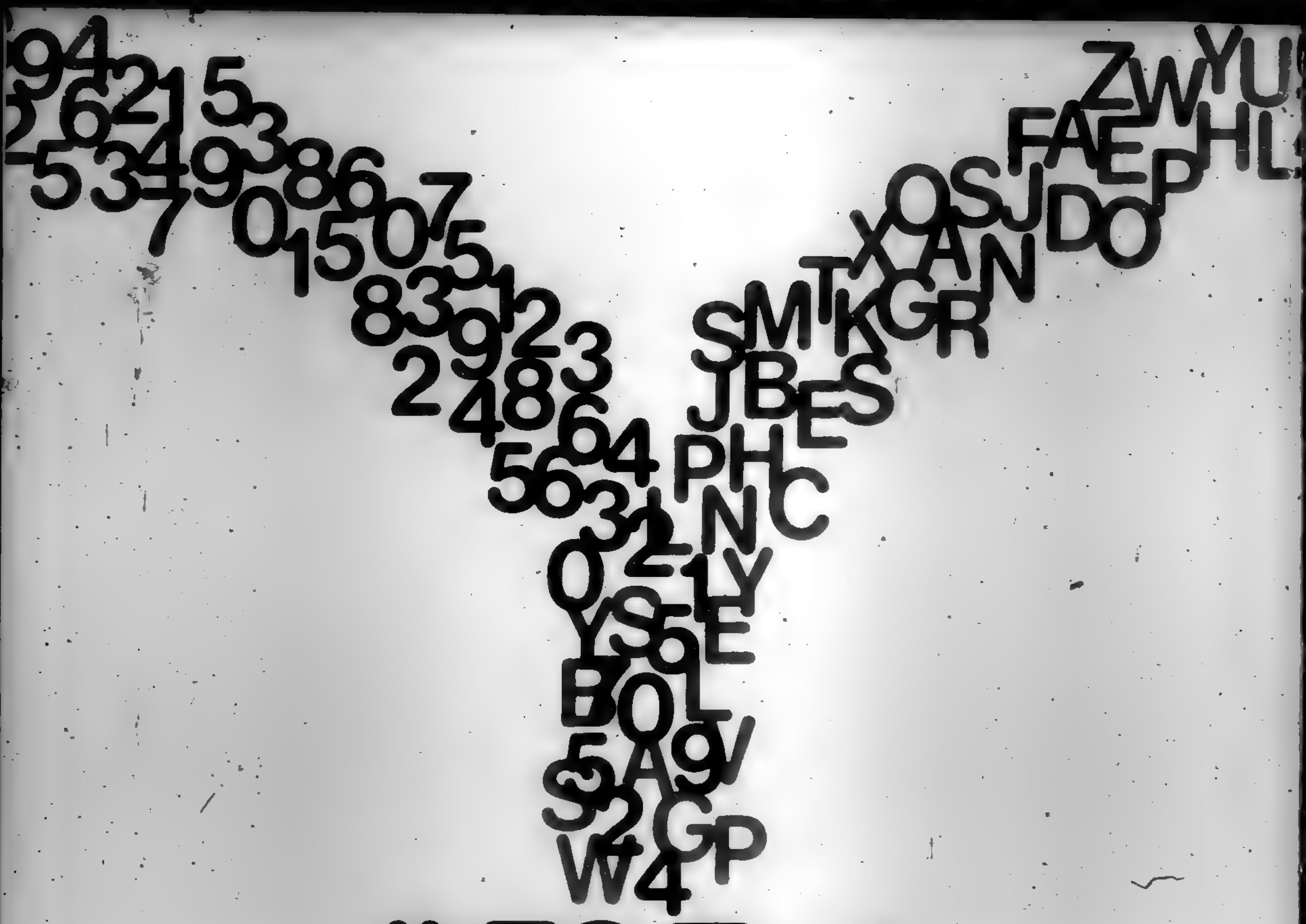

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Who Controls The OA Budget?

OA is predicted to skyrocket during the next decade. Finding out how others spend their money may help you budget more wisely.

By Thomas Elliott

With total U.S. office automation equipment sales topping $7 billion in 1982, somebody is obviously spending a lot of money on OA. And with revenue growth rates in the double digits for most OA vendors, users are apparently spending much more each year than they did the previous year. However, to go beyond these clear, unassailable, but not terribly useful statements is to enter a realm of conjecture.

Who is spending how much on what? Who decides what gets acquired and what doesn't? Does anybody keep track of OA expenditures in most organizations? If so, who? Is there an OA budgeting process? Is it different from other forms of budgeting and control, or is buying a word processor like buying a turret lathe? Do different industries and sizes of organizations handle OA budgeting and control differently?

Answers to questions like these would draw a much more complete picture of the OA business, useful not only to vendors seeking to understand their markets better, but also to users looking for ways to manage OA better. For the past two years, International Data Corp. (IDC) has been looking at the organizational aspects of OA and has recently completed an OA user spending study of 300 organizations. The study illuminates some of the critical budget and control questions.

In general, we found that a few common organizational patterns are developing in OA management, and they are consistent across industry and, to a lesser degree, across organizational size ranges. OA management responsibility usually includes at least keeping track of OA expenditures, although the actual authority for expenditure tends to be shared between OA management and the ultimate end-user department. As for actual spending levels, we found that budget expenditures were increasing in the organizations we surveyed. However, for a variety of reasons, ranging from the economy to cost-justification issues, percentage increases for 1983 vs. 1982 would be lower than 1982 vs. 1981 increases.

OA is a convenient term, but it is not a terribly specific one. There is a general consensus about what is probably included when the term is used, but no definition exists that cannot be proven inadequate. This degree of certainty is scarcely one to give comfort to accountants talking about budgeting and control. For this reason, after establishing the size and industry of the responding organization, we asked as our first item on our user spending survey what kinds of hardware and software were included in OA for the purposes of budgeting and control.

As might be expected, word processors were the single piece of equipment most frequently included, followed by WP done on mainframe computers. Of 325 survey respondents, 289 and 200, respectively, indicated inclusion of these two products. Desktop computers made a strong showing, with 177 responses, suggesting that in many organizations desktops are being considered as something more than simple extensions of data processing. Interestingly enough, in light of the attention being paid to voice/data integration in the OA literature, only 86 respondents indicated that any form of voice communication was included in OA budgeting.

Patterns of product inclusion in OA differed between smaller organizations and larger organizations. No major differences appeared in the rate at which respondents included desktop computers and word processing on either a dedicated or a mainframe application level. Larger organizations, however, were more apt to include electronic mail and multifunction office systems in OA than were smaller firms. This is understandable, since electronic mail is likely to be more useful in large organizations than in small ones, and multifunction office systems may be more attractive to larger organizations with some financial room to experiment with new technologies.

The nature of OA, in particular this lack of clarity about what should and should not be included, raises some critical issues for financial management of the OA effort. Some OA technologies, like desktop computers, are inherently decentralizing: they continue well-established DP trends toward moving processing power to the end user. Similarly, convenience copiers can be seen as moving copying power away from central reprographics. Other technologies, like electronic typewriters and stand-alone word processors, may be seen as simply new versions of existing office technologies over which there has historically been little central organizational control.

Technologies like electronic mail, however, have some centralizing influence because they frequently cross organizational boundaries and involve central resources. To the extent that OA continues to move toward intersystem communications, organizationwide networking and the sharing of organizational data bases, this centralizing tendency will strengthen.

Strongly decentralized organizations tend to have budgeting and control systems very different from those of centralized organizations. Spending authority is delegated further down and out on the organization chart, review

> ***"Strongly decentralized organizations tend to have budgeting and control systems very different from those of centralized organizations."***

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procedures focus less on line item details and more on net results and so on. Therefore, the nature of OA in any given organization determines what approach is reasonable for budgeting and control of OA expenditures. If OA consists purely of word processing on a departmental level, then a heavily centralized structure may be inappropriate. If, however, a multisite, multidivision company is interested in electronic mail, then some degree of central control makes a lot more sense.

> ***"The majority of organizations with any involvement at all in OA have appointed an individual or committee with some degree of management responsibility for OA throughout the organization. In many cases, the appointment was fairly recent."***

Managing OA, of course, includes a number of responsibilities that do not bear directly on the budgeting and control of OA expenditures, such as technical equipment evaluation, training programs and top management education. However, much of OA management — like much of management in general — comes down to how funds are controlled.

IDC has been looking at management structures for OA in a number of different surveys and interview programs, including the recent one on user spending. In spite of a great deal of diversity in how organizations approach the management of OA, some common tendencies seem to be emerging.

The majority of organizations with any involvement at all in OA have appointed an individual or a committee with some degree of management responsibility for OA throughout the organization. In many cases the appointment was fairly recent: in two surveys published in 1981, between a third and a half of the individuals and committees had been appointed within the past year.

In the recent user spending survey, respondents again indicated overwhelmingly (70%) that there were individuals or committees with organizationwide OA responsibilities. Larger organizations seemed significantly more likely than smaller ones to have made such an appointment. Of those indicating an organizational revenue or budget of less than $25 million (18% of the sample), only 63% had designated OA responsibility, as opposed to 77% of the organizations over $1 billion (17% of the sample).

There seems to be a clear trend to locate OA responsibility within the DP or management information services (MIS) function. In one earlier study, over half the individuals who indicated they had OA responsibility also had DP/MIS backgrounds; in the user spending survey, about two-thirds of the 325 respondents indicated OA was a management responsibility of the DP or MIS department. Larger organizations and organizations spending a relatively large amount on OA were more likely to allocate responsibility this way.

"Having responsibility" for OA obviously covers a lot of ground. To ascertain exactly what is meant by that term, previous surveys have posed a series of more specific questions, such as:

Does responsibility include planning, financing and implementing pilot projects? Does it include acting as sole OA purchasing authority?

Generally speaking, the results have suggested that OA responsibility tends to be more persuasive than coercive. For example, more respondents indicated responsibility for monitoring OA expenditures than for controlling them.

In the user spending survey, 208 respondents indicated that monitoring expenditures was part of the responsibility of OA management, but a significant number (135) indicated monitoring responsibility was shared among one or more different departments or individuals in addition to the primary OA management individual or group. As might be expected, controller or accounting departments were most frequently mentioned as sharing responsibility (39%), followed by DP/MIS and purchasing, with 21% and

we recommend is to build your management information system (MIS) the same way you build a house. *From the ground up.*

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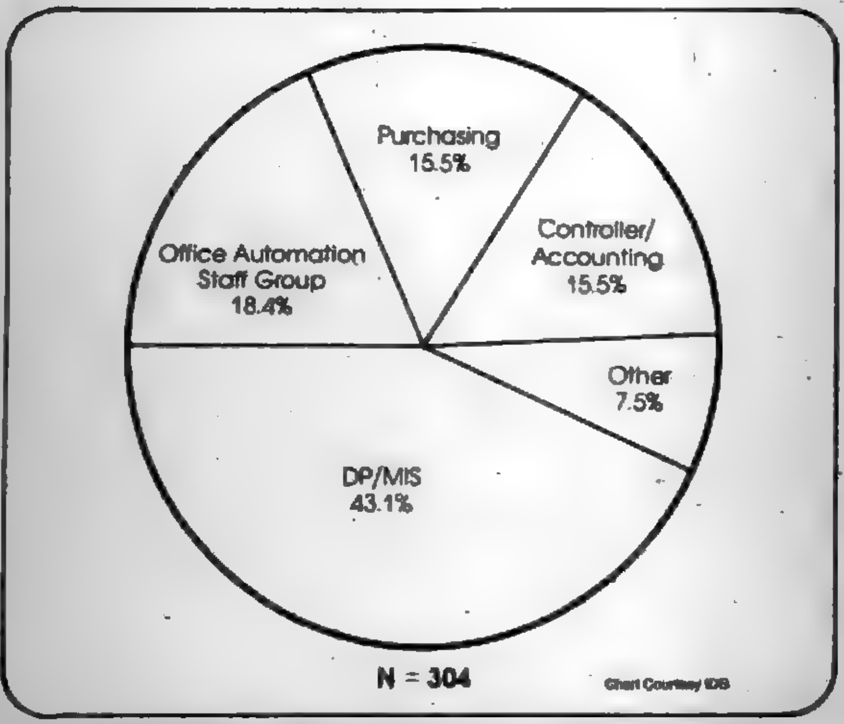
1[illegible]% respectively. (Considering the centrality that purchasing departments have historically had with office equipment expenditures, the relative infrequency of their mention is interesting.)



**Responsibility for Acquisition Evaluation
(In Addition to End Users)**

Having designated responsibility for OA, even including monitoring expenditures, does not appear to be the same as having a comprehensive OA plan. Respondents to the user spending survey were asked if there was an organizationwide plan for OA and, if so, whether it included a formal budget or spending plan. Less than half indicated that their organizations had a plan, although about two-thirds of those who did said it included a budget. There seemed to be no correlation between the size of the organization and the likelihood of having an OA plan, although — not surprisingly — organizations with larger OA expenditures were more likely to have one.

Procedures by which funds are allocated and expended for OA equipment acquisition vary slightly from organization to organization, but they don't appear to be too different from any other sort of capital allocation process. In fact, in response to the statement "OA equipment budgeting is essentially like all other capital budgeting," almost 60% of the user spending sample agreed this was "a very good description of our process." (Only about 5% indicated it was "definitely unlike our process.") Furthermore, more than 80% of the respondents indicated that the spending authority limits of managers were the same for OA equipment as for other types of spending.

Given the level of interest in cost-justification of OA, we decided to ask if cost-justification was a required part of all OA equipment proposals. Almost three-quarters of the respondents replied that this was at least partially the rule in their organizations. However, slightly less than a third said it was usual for follow-up studies to be done to see if original cost-justification claims had been met. This set of statistics will certainly encourage skepticism among those inclined to believe that cost-justification is all done with mirrors, anyway.

Some features of OA spending may be significantly different from other forms of capital allocation. The nature of office automation is such that it doesn't necessarily divide along existing budgetary lines. Some resources must be shared to be cost-effective, and in other cases corporate management may be interested in investigating new technologies that no individual manager would be willing to fund purely out of his own budget. Accordingly, it seemed worth asking exactly how expenditures were made.

Survey respondents were given four alternative descriptions of their expenditure process:

- All expenditures are made by end users.
- Studies and pilot projects are funded by a central OA budget, but all ongoing expenditures come from end users.
- Some ongoing expenditures come from a central OA budget.
- All expenditures come from a central OA budget.

An "other" option was also provided; one respondent took advantage of this to note that his organization's method of expenditure was "total chaos."

The most frequent choice (37%) was that end users are responsible for all expenditures, followed by a central OA budget paying for pilots and studies (24%), then by a central budget paying for everything (17%) and finally by the case where a central budget picks up some ongoing expenses as well as pilots and studies (16%). The fact that there is no overwhelmingly dominant pattern for handling expenditures suggests organizations are tailoring their OA budgeting practices to suit their particular circumstances.

Some significant differences became apparent when the sample was broken down by organizational size and by size of OA budget. In general, reliance on a central budget seems to increase with the size of the organization and the OA expenditure level. Smaller organizations were much more likely to assign all expenditures as an end-user responsibility than were larger organizations. Organizations with total OA equipment expenditures under $50,000 in 1982 were about half as likely to have all OA expenditures come from a central budget as were organizations spending more than that amount. Also, the tendency to fund pilot projects and studies from a central budget seemed to increase with both organization size and amount of OA expenditures.

Not all survey respondents were willing or able to indicate how much their organizations were spending on OA equipment, but enough did (298) to give us some useful information. Of those responding, about 28% indicated 1982 expenditures were less than $50,000, 30% placed the figure between $50,000 and $100,000, 38% put it between $100,000 and $1 million and the remainder indicated OA expenditures between $1 million and $5 million.

To nobody's great surprise, larger organizations tended to have larger OA expenditures. What is a little more surprising is that some of the smaller organizations reported relatively large OA figures: 15 respondents from organizations with revenues/budgets under $25 million indicated OA expenditures between $100,000 and $1 million. At a minimum, this means that 0.4% of revenues/budgets are being spent on OA equipment in these organizations — not an insignificant sum.

In many cases, OA spending is tracked as part of DP spending: 165 of the 325 respondents indicated this was the case in their organizations. About half of these replied that OA expenditures constituted between 1% and 5% of the total DP budget; only about 11% indicated it was more than 10% of the DP budget. Smaller OA budgets seemed to represent smaller percentages of their organization's DP budgets. This makes sense if you assume that smaller OA budgets imply that an organization is in a pilot or small-scale implementation phase, in which case, OA expenditures are likely to be limited relative to more established DP budgets.

Respondents were asked to indicate the direction and percentage of change between their 1981 and 1982 OA expenditures, and project the same things for their 1983 expenditures relative to 1982. On the whole, budgets have increased and are going to continue to do so. Of the 183 respondents who indicated at least the direction of change for both years, 100 said that their 1982 expenditures were more than those for 1981, and that 1983 would be larger still. In only one case were OA expenditures on a steady decline from 1981 to 1983.

However, the percentage of respondents indicating a stable OA expenditure level increased from 21% of the sample for 1982 vs. 1981 to 29% for 1983 vs. 1982. The survey results indicate that, while the OA market is increasing, a number of variables will dictate how quickly that market grows. OA

Elliott is associate director of research for International Data Corp., in Framingham, Mass. He is responsible for market research in the major OA technologies and is the author of the report referred to in the article.

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Taking A Look At Data General

DG must prove itself in the OA marketplace if it wants to win a piece of the pie. And that's just what DG says it is going to do.

By Ann Dooley

Skeptics might say that Data General Corp. has an uphill fight ahead. Skeptics, however, aren't necessarily successful fighters, and that is what DG contends it is going to be.

In the midst of a recession, DG is not only expanding its base, it is also taking on established office automation vendors. More than any other minicomputer vendor, DG has sold to the OEM market. Now it is trying to appeal to end users in the fast-moving OA industry.

One of the up-and-coming minicomputer companies of the '70s, DG almost immediately began parading high-growth revenues and a "workhorse" of a machine called the Nova, a 16-bit minicomputer. But in 1980, DG's sensational revenue spiral of 45% annual growth ended. Although the bubble was bursting for many of its minicomputer competitors as well, DG's reputation has never been the same.

For the last several years, industry rumors have circulated that the company was on the verge of being acquired. The rumors stemmed primarily from DG's seeming inability to keep pace with an evolving marketplace. Critics contend DG was suffering from a product line and organizational structure that were rapidly growing obsolete. Once an overnight success story, DG didn't seem able to maintain a sharp product focus in the evolving industry a decade later. In the 32-bit system market, for example, DG came in a year late.

Nevertheless, the company is refusing to listen to the doomsayers. DG's vice-president and chief financial officer, Kenneth Jaeggi, maintained that the company has never been in a stronger economic position and that the OA market is one of its top priorities. In the last six months, DG has also reportedly doubled its research and development efforts in the OA arena and made "sizable" investments in marketing and staffing.

Known as a conservatively managed company, DG recently was one of the first computer companies to strengthen its position against unfriendly takeovers. Although few high-tech companies have been victims of unfriendly takeover bids (as occurred in the Bendix/ Martin Marietta war), many will probably begin to be aware of the possibility. "If you're in it for the long term, you don't want to keep looking over your shoulder," John Adams, president of Adams, Harkness and Hill, Inc., commented.

With this and other moves, DG has demonstrated it plans to be around for the long haul. DG's 1981 year-end announcement of its Comprehensive Electronic Office (CEO) system clearly showed its competitors that the company was focused and committed to the office market. The industry consensus has been favorable concerning the CEO system, which is based on Eclipse minicomputers and Dasher workstations. Conceptually, the system lives up to its name, providing users with an integrated, comprehensive system including electronic filing, electronic messaging, administrative support, word processing, decision support, a local-area network (Xodiac) and data processing. It also supports both IBM-compatible Systems Network Architecture and X.25 communications capabilities.

An edge DG holds over the competition is that its products are deliverable today, according to J. David Lyons, vice-president and general manager of the Information Systems Division. When some executives and top sales staff left the company, DG enlisted a number of erstwhile IBM people. Lyons, formerly a director in the IBM product development group, was one of these. "It's hard to find any offering that is totally integrated across all operating systems and that can be shipped today," he charged. DG might have announced later than some others in the market, but it is further ahead in product development, Lyons maintained. In illustration, the ex-IBMer said that DG assumed as far back as 1977 that CEO would run on the AOS and AOS/VS operating systems, all communication product lines and on all processors from top to bottom.

DG defines the office from a broad perspective and its CEO system reflects this philosopy, according to Thomas Billadeau, president of The Office Systems Consulting Group. DG approaches OA via delivering computer services for all who work in the office — not through auxiliary services and add-ons, but in one package. "It's a commitment to be applauded," the Boston consultant noted.

But the system does have some problems. One is in its delivery to the end user. The CEO has a traditional DP entry approach, which is "totally unacceptable," and needs a soft-key functionality, Billadeau said.

David Terrie, senior analyst for office systems at International Data Corp., agreed, calling CEO well designed from the inside out: "Everything is integrated and fits together nicely." More work is needed in the system response time and in the word processing, but those are problems with a lot of the minimakers offerings, he added. Terrie's major complaint was also the user interface. CEO's function keys are complicated, but for a first time out of the box, it's very well done, he stated.

DG says it is aware of the problems and is working to improve the system. A new keyboard will be coming out this year with changes in the shape, touch and layout, according to Barbara Babcock, market development manager. DG's word processing has also traditionally been treated as a text method in which to enter the system, and it doesn't reflect the quality of the rest of CEO. "It's good, but not a star," she added.

DG intends to strengthen its WP offerings. It will introduce a dictionary to allow new methods of doing key words without using up a lot of system overhead. It also plans to upgrade interfaces — both in terms of enhancing the present keyboard to make it more friendly and researching different kinds of interfaces, Lyons said.

In addition to enhancing its present system, DG acknowledges CEO still has some pieces missing. One is an integrated voice facility,

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and the other is a desktop or personal computer capability. DG intends to integrate full voice messaging and is currently talking with several PBX vendors, according to Lyons. Although the company has no timetable for a voice product, it's possible it will be available by the end of this year. DG will also be researching new types of workstations, Babcock said.

The company's commitment to standards support will reportedly remain unchanged, particularly in relation to fiber optics and the IEEE 802 CSMA/CD local-area network standard. It plans, in addition, to broaden its local-area network capabilities via the Xodiac. DG wants to remain flexible regarding local-area network alternatives.

While Lyons would not say specifically whether DG would be offering a personal computer, he alluded to DG's providing personal computing capacity rather than a personal computer per se. Although the company does not have a personal computer, Babcock maintained that existing personal computer offerings don't necessarily provide solutions to people's OA needs. A desktop personal computing device needs a network and shared data bases. The personal computers now available don't handle office work, Babcock said, adding that no one has yet come up with the final answer.

The company will be increasing its product breadth to include offerings for the large user and the smaller department, according to Babcock. DG has aggressively priced its newest entry, the MV4000, to gain a competitive edge and is hoping to use it to gain market entry into smaller departments and remote sites. According to Billadeau, DG appears to be heading toward using the MV4000 as a turnkey OA system.

DG sees itself as being an integrated office supplier, Robert Miller, vice-president of DG's Business Division, stated. OA will eventually become the umbrella under which DP will function, Miller predicted. DG may be behind companies like IBM, Xerox Corp. and Wang Laboratories, Inc. in establishing a presence in the OA market, but he contends it won't make any difference in the long run.

Only 3% of the total OA marketplace dollars have been spent so far, and that still leaves 97% open. "We're believers in the marketplace, that's our bottom line," Miller stated.

Lyons recognized that moving from an OEM base to an end-user market will not be an easy job. The company seems to be looking at CEO to spark the flame. Like other companies, DG is aiming CEO initially to penetrate its installed base. The question remains, however, whether it will be able to win any new market share. DG expects CEO to make a major contribution to its future. IDC's Terrie believes that, while it is a positive step, it may make less of an impact than the company is hoping for.

> ***"DG is aiming CEO initially to penetrate its installed base. The question remains, however, whether it will be able to win any new market share."***

In examining DG's future, John Adams remarked on the "difficulties in conducting business with rumors swelling around your name." But looking at the bright side, he added that CEO is a viable product that's beginning to sell and that should never be underestimated. "It's like making a beachhead at Normandy — once it's actually done things get easier."

Right now it's a great big, forgiving market, and the lines haven't settled yet, Adams said. DG may in fact be getting in at a good time. Because DG is smaller in size than IBM or DEC, for instance, it can be more flexible — which is good. At the same time, it doesn't have their assets, so it must be more selective — which may not be so good.

Agreeing that the financial rumors concerning DG would probably have an effect on any company, Billadeau noted that even if DG is eventually restructured or acquired, it is still a sound company and is not going to disappear. DG is in the position of needing to have a better strategy, pick its fights and not make mistakes, he stated. OA

Dooley is editor of Computerworld OA.

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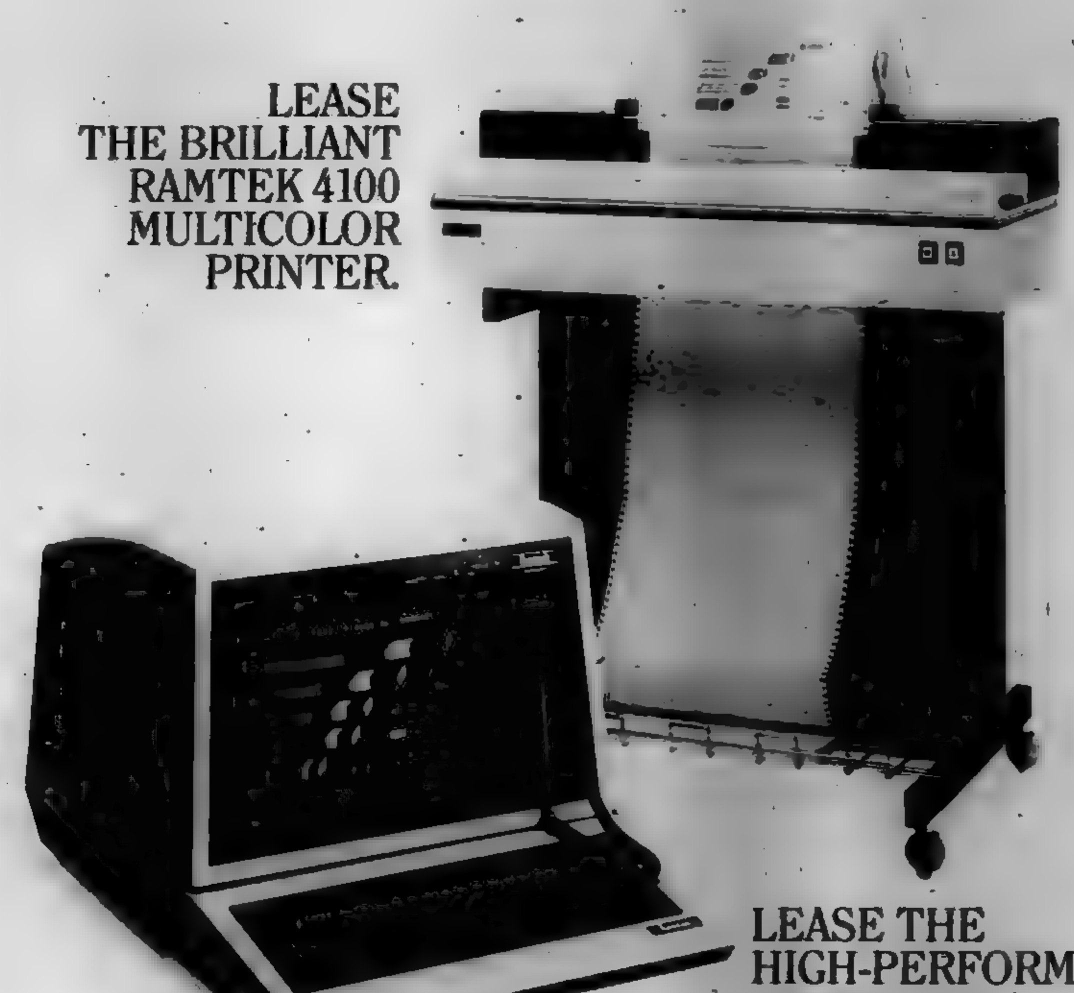

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Smooth Sailing

The mainframe computer environment was where it began. But now it's smooth sailing for personal computers, particularly in the office.

By Alan D. Mazursky

Microcomputers are producing a revolution in the way many of us function at work. Neither mainframe computer systems nor traditional word processing systems have had such an impact on our work lives. For the first time, users are finally getting control of their processing power. Business people are now using microcomputers as stand-alone or distributed "analysis" workstations, powerful WP systems, inquiry and data entry stations connected to mini or

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"The most important factor in determining the application of micros in the office is functionality. It is not the brand name or the biggest and best system that is important. Importance is gauged by what the system can provide for the users to make them better at what they do."

mainframe processors and as full business (production and accounting) systems.

Frequently we forget that the capabilities we now have with microcomputers were not available even three years ago. Until recently, all processing and analysis had to be performed either on the organization's mainframe or minicomputer system or by hand in quill-and-pen mode. Microcomputers now allow many office functions to be performed at costs considerably lower than those involved with more traditional minicomputer-based office systems.

Microcomputers now are being used to handle many business office needs, such as:

- Word processing, including report preparation, list processing and data-base handling of abstracts, comments and briefs.
- Financial analysis, including budget and financial statement analysis, systems modeling and simulation, portfolio charting and modeling and cash flow and production forecasting.
- Mathematical analysis: statistics, linear programming, Pert and CP/M (project or job stream control) and production and market modeling.
- Color-graphics generation: Use of full-screen and hard-copy color graphics, creation of freehand graphics using digitizing tablets, display graphic and textual material through automated presentation systems.
- Communications: participation in electronic mail networks, accessing remote data bases, inquiry/data entry to host mainframes, accessing public networks and functioning as local-area network workstations.

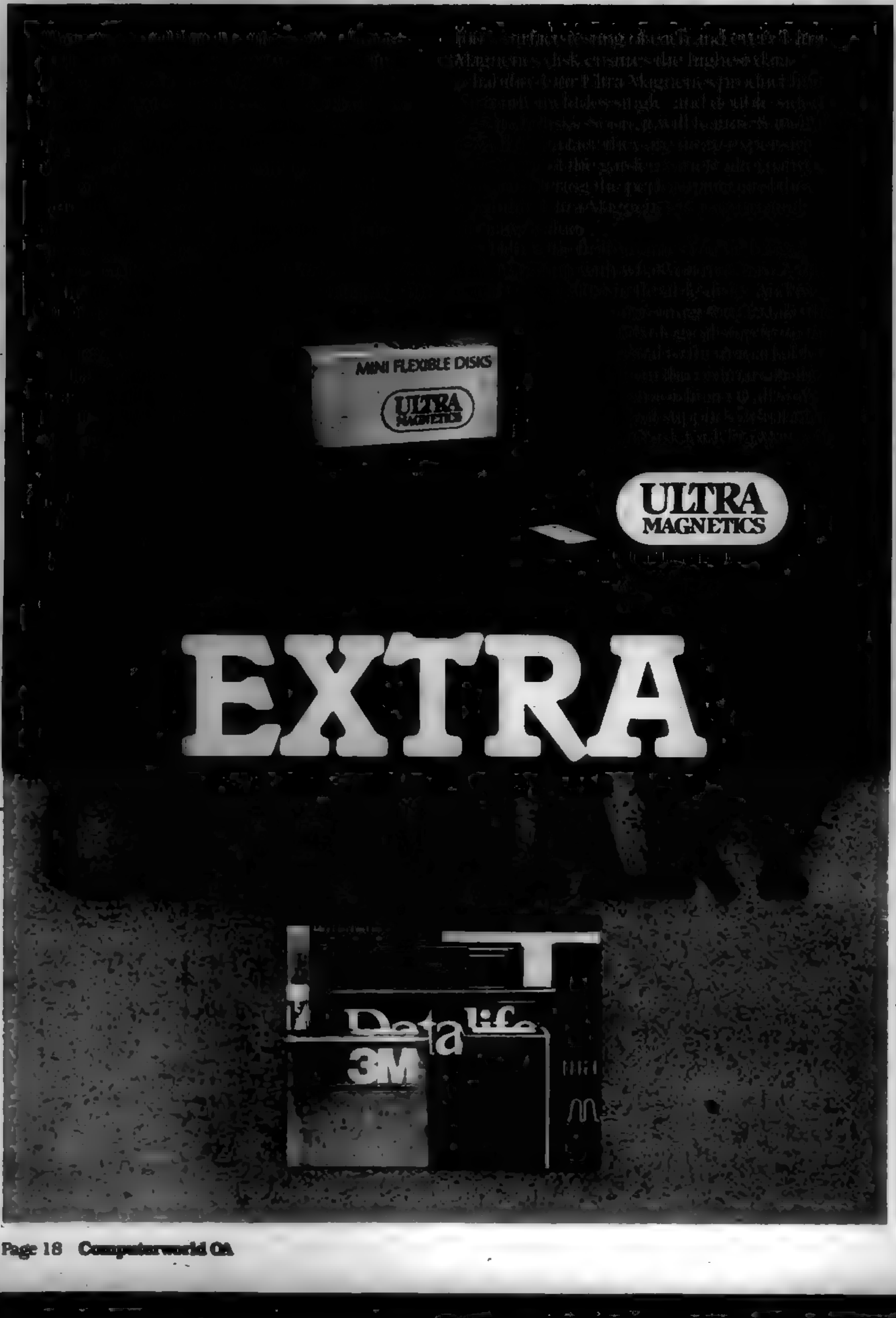
The above functions and others are being performed through microcomputer workstations in many organizations. These workstations can be used as standalone applications processors or as part of distributed networks, tied into the organization's systems, local-area networks and broader networks.

The most important factor in determining the application of micros in the office is functionality. It is not the brand name or the biggest and best system that is important. Importance is gauged by what the system can provide for the users to make them better at what they do. Although 16-bit machines are here, many applications can be performed adequately and at a substantially lower cost with 8-bit micros. Similarly, many applications can and should be performed in a standalone configuration, while others dictate the need for a shared capacity (either multiuser or networked).

The 1980s has been identified as the decade of communications. During the coming years, the control, analysis and effective communication of information will be among the determining factors of an organization's health and viability. Much like controlling the factors of production was important for the industrial revolution, so will controlling the means of communication be important for the information revolution.

Micros are now being used to access many data bases available to the public, including Micronet, The Source and the Dow Jones News/Retrieval Service. These networks offer services, data and programs that can be used for business applications. Other specialized network services are also offered, like Auerbach (computer-related information) and Lexis (law-related information). Also, many micro systems are currently being used to access the Telex network for transmitting important messages to other workstations on the network. During this decade, these network services will proliferate.

Micros are frequently the sending and receiving computers for communications networks like Telenet and Tymnet, which support data, document and electronic mail transfers. Although most micros currently communicate asynchronously at 300 bit/sec or 1,200 bit/sec, full use of the public packet-switched networks supporting the ISO Open Systems Interconnect architecture will require that hardware vendors em-



bed X.25 communications protocol hardware in the next generation of microcomputer products. The use of X.25 protocols has the major advantage of guaranteeing end-to-end transmission of packetized data and therefore reduces the risk of receiving corrupted data.

A growing opportunity exists for organizations to take advantage of these public networks. Many companies are investigating the use of micros for collecting and communicating data (for example, factory orders) to various remote sites — domestically and abroad. These organizations have recognized that it is not necessary to use mainframes or minicomputers in situations where micros can be used effectively — and at a much lower cost.

In the move to put a workstation on every desk, we must consider how we want the system architecture to look from a functional standpoint. Do we want our workstations to have local storage and processing power while still communicating (implying a network design), or do we want to implement a multiuser micro environment (implying a more traditional minicomputer-type environment)?

Some of the larger microcomputer systems (such as those from Fortune, Altos Computer Systems, Inc. and Cromemco, Inc.) are capable of supporting a number of users on a single host "micro"-processor. Architectually, these systems are very much like the minicomputer systems currently available. However, lower cost configurations are possible and it is possible to run many of the popular microcomputer software packages on these systems. They also share with minicomputers a basic drawback — if the host processor goes down, so do the terminals.

the organization require this type of architecture for its processing needs?" If a data base is shared frequently and there is a heavy processing load, this might be the correct choice. If the work load is sufficiently large, consideration should probably be given to the minicomputer level.

Application	Product	Vendor
Spreadsheet Packages	Visicalc	Visicorp
	Supercalc	Sorcim
	Multiplan	Microsoft
	Calcstar	Micropro
	Target	Comshare target
Financial Modeling	DSS: Financial	Addison-Wesley Publishing
	Context/MBA	Context Management
	FPL	Lifeboat Associates
	Finplan	Hayden Publishing
Word Processing	Wordstar	Micropro
	Vedit	Compuview Products
	Easy Writer	Information Unlimited
	Word Juggler	Quark Engineering
	Scriptsit	Tandy
	Word Handler	Silicon Valley Systems
	Final Word	Mark of the Unicorn
Data Base Systems	Dbase-11	Ashton-Tate
	DB Master	Stoneware
	Datastar	Micropro
	FMS-80	Systems Plus
	Condor	Condor Computer
Graphics	Apple Business	Apple Computer
	Chartmaster	Decision Resources
	Visiplot	Visicorp
	Strobe	Strobe
	EBS	Lotus Development
Communications Software	Microlink	Wordcraft
	Amcall	Microcall Services
	Data Capture	Southeastern Software
	Micro-Courier	Microcom
	Z-Term	Southwestern Data Systems

Figure 1. Some Widely Used Micro Software Packages

The alternative of using a local-area network presents some interesting possibilities. A number of physical and logical design approaches are available for local-area networks and are described below.

☐ **Topologies:**

- Star — Devices are interconnected through a centralized network controller.
- Bus — Devices are interconnected directly by cables and may pass thru nodal control points.
- Ring — Devices are connected in a circular (ring) pattern.

☐ **Cabling:**

- Twisted pair — Essentially phone-line cable. Offers low cost and low-speed transmission (56K bit/sec).
- CATV — Essentially cable TV cabling. Offers high cost and high-speed transmission.

☐ **Communications control logic:**

- Token passing — A device is allowed to transmit only when it gains control of a "token." Token passing is best suited for long transmission lengths and large message packets.
- Carrier sense multiple access with collision detection (CSMA/CD)— Devices monitor transmission line for a not-busy condition. Data transmission is monitored by device to determine if data packets have collided; if so, data is retransmitted. Suited for small-size data packets.

☐ **Capacity:**

- Baseband — Offers transmission speeds up to 10M bit/sec. Assigns capacity of network to one transmitting device at a time. Offers low cost and is good for low-volume data traffic.
- Broadband — Offers very high-speed transmission, is capable of supporting data and voice communication and supports concurrent device transmissions. Entails high cost and is good for high-volume transmission.

Two popular microcomputer-based local-area nets are Cluster One by Nestar Systems, Inc. and Omninet by Corvus Systems, Inc.; both use the twisted-pair architecture. One possible drawback of this type of network is that support is currently offered only for a limited selection of micros, which forces a hardware standardization. (In the larger sense, this may or may not be warranted).

Other micro-based networks now being implemented by many corporations include, among others, Digital Research, Inc.'s CP/Net and Zilog, Inc.'s Z-Net. Micros can also link into mini-based local-area nets such as Ethernet from Xerox Corp., Intel Corp. and Digital Equipment Corp.; Wang Laboratories, Inc.'s Wangnet; Datapoint Corp.'s Arcnet; Sytek, Inc.'s Localnet.

Many issues should be considered before a decision is reached on a network or multiuser implementation. These issues — such as work load, technological integration, functionality, cost/benefits and software availability — have always been the core of intelligent DP decisions. As microcomputer applications become increasingly more sophisticated and complex, so, too, do the types of decisions we make about their implementation.

There is no quick answer as to which techological alternative to select, but the driving force should always be the strategic business need.

Microcomputer software has already distinguished itself as being innovative, user-friendly and powerful. The available software includes systems for word processing, portfolio analysis, financial and production modeling (including simulation and forecasting), data base management and full-blown accounting systems. The acknowledged leaders in the marketplace show a flair for understanding what users need, presenting the system to users and maintaining reasonable pricing structures and — more importantly — quality. Some widely used software packages are shown in Table 1.

The following popular applications have found a firm foothold in the automated office:

- Spreadsheet packages: These are the primary legitimizing factor for businessmen. They enable nontechnical users to "program" financial forecasts, budgets and so on. They also provide interfaces to graphics processors for such things as trend lines and pie and bar charts, and they are excellent for small modeling tasks.
- Financial modeling languages are used for complex models with large data files. They provide some integration of functions and are considerably more expensive than the spreadsheet packages.
- WP packages include most, if not all, of the features offered by mini-based WP systems and they are considerably less costly than traditional WP systems. They enable users to prepare reports (including spreadsheets, graphics and so on) without resorting to the typing pool or report department. They also allow users to transfer documents to and from many WP systems.
- Data base systems support users in complex tasks by presenting a logical (relational) view of data to the user: by absorbing the detail file/data management tasks, thus allowing the user to concentrate on managing the application, not the data; and by functioning as a very useful centralized data center for users connected on a local-area network.

Possible applications include financial and market modeling, document and brief abstracts, personnel assignment and client billing and integrated accounting systems.

- Graphics systems offer enhanced data presentation capabilities. ("Everything is in the delivery.") They also function as interfaces to data bases, spreadsheet packages and modeling systems.
- Communications packages provide communications protocol support for asynchronous transmission (public networks), bisychronous transmission and 3270-emulation and packetized transmission (for example, X.25 protocols). They also enable connection to public-access data bases, corporate mainframe host systems, other micros (point-to-point) and so on.

Over the past few years, the micro-software industry has experienced considerable growth both in numbers and sophistication. A shift has occurred from the cottage industry to the corporate environment. Software systems have blossomed from those with limited stand-alone functionality to those employing concepts of multifunctionality, integration and communication. (Table 2 provides a brief recap of the micro-software industry). The next few years should bring the implementation of truly integrated software (and hardware) systems. These systems will:

- Require little technical computer expertise. Users should not have to worry about brand of computer, type of operating system or management of data files (for example, details of I/O access methods or conversions).
- Benefit users who understand problem solving techniques and are not afraid to try new approaches.
- Integrate such functions as word processing, graphics input and output, automated slide-show presentation capabilities, voice recognition and synthesis and communications protocol support.

These types of packages are beginning to appear. For instance, Context/MBA and Micro-DSS:F display some of the integration features mentioned above. The current marketplace will show a radical shift over the next year — all for the better.

The early 1980s has brought a natural evolution of hardware from an 8-bit world (Apple II, TRS-80, Osborne I, Commodore CBM, and so on) to the more powerful 16-bit microcomputers (such as the IBM PC, Fortune 32:16 and the DEC Rainbow). The following shifts are occurring:

☐ Main memory:
- 64K bytes to 1M byte.

☐ Mass storage:
- Floppy diskettes (400K bytes) to hard disks (20M byte).

☐ Operating systems:
- Single to multiuser.
- Uniprogramming to multiprocessing.

☐ Technology changes:
- 5.25 in. floppies to 3 in. rigid floppies.
- High-resolution screen color graphics.
- Use of digitizing tablets, touch screens, light pens, voice and so on as input devices.

From the perspective of functionality, organizations should not be concerned with the particular piece of hardware being used. Hardware is nothing but a commodity, like a record player or a typewriter. If the hardware and software satisfy a particular need and are consistent with the organization's objectives, then users should be given the latitude to acquire these support systems.

Of course, the key phrase here is "the organization's objectives." Management should always be looking toward the future needs of the organization. Consideration should be given to the possible requirements for integration and compatibility, as well as to the need for short-term expedients.

> ***"From a very pragmatic point of view, we need to recognize that, for many organizations, the current mainframe DP systems are barely able to produce the minimum information required to run the business, much less support management and staff with their analytical requirements."***

Many articles are being written on the dangers of proliferating different microcomputers and generating distributed data bases. These problems should be recognized and understood by management in the context of short-term and long-term goals. However, from a very pragmatic point of view, we need to recognize that, for many organizations, the current mainframe DP systems are barely able to produce the minimum information required to run the business, much less support management and staff with their analytical requirements. Often, users' requests for mainframe analytical systems are put into a backlogged development queue with delivery promised for two to five years down the road.

Therefore, we must support users who wait to implement their decision-support systems in the

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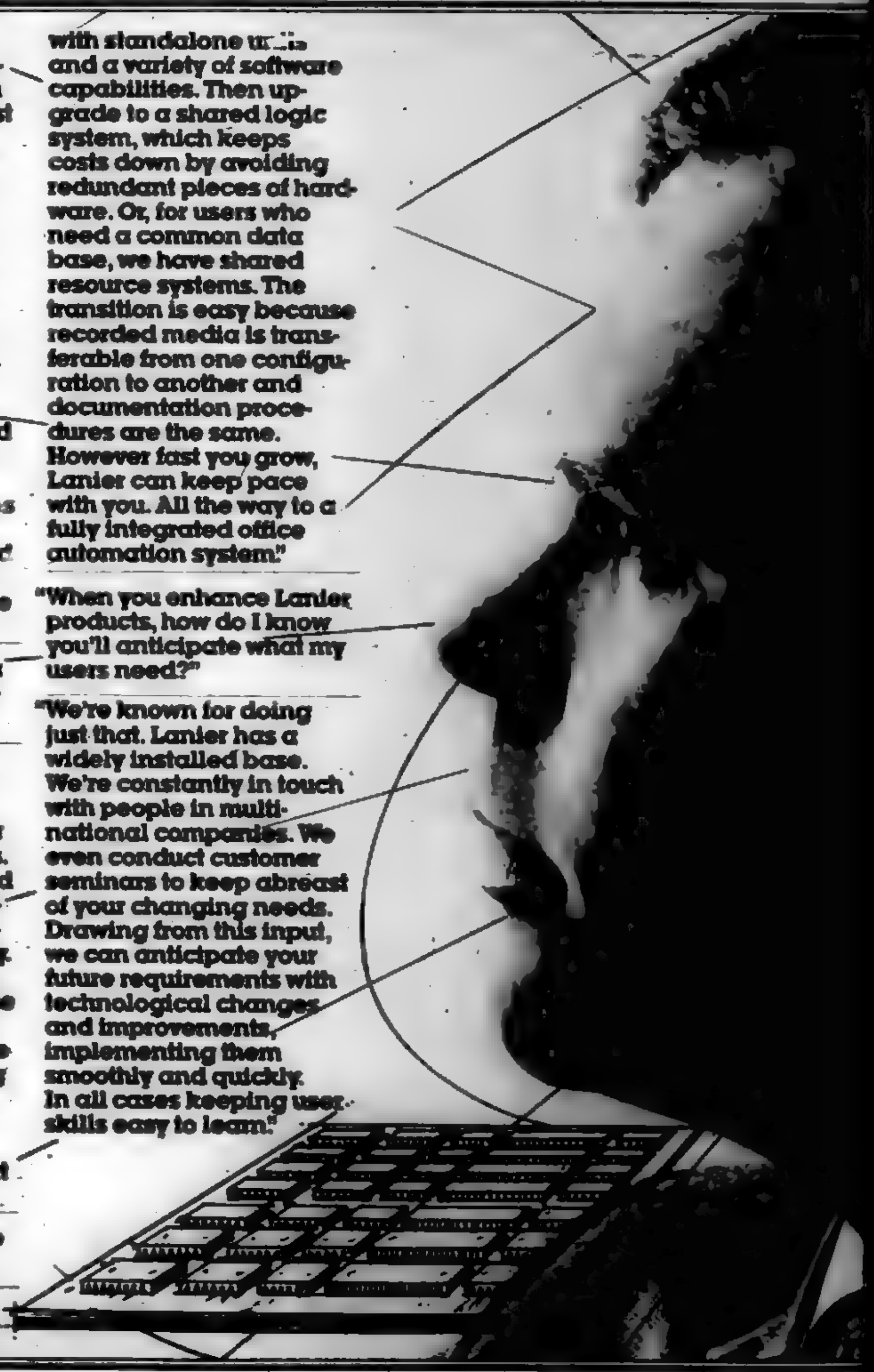

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short term and not focus on long-range requirements to the exclusion of what can be achieved today using microcomputer technology.

Time Frame	Description
Late 1970s	Home-grown and limited-function software.
Early 1980s	Packaged software, including: WP and electronic spreadsheets.
Mid 1980s	Integrated software packages: single "systems" combining WP, graphics and modeling software.

Figure 2. Development of Micro Software Technology

Operating systems on the micro level have been important in determining users' and software vendors' acceptance of the hardware products. Basically, there are two types of operating systems: proprietary (like Appledos and Trsdos) and generic (like CP/M, Msdos and Unix).

Proprietary operating systems function on only one vendor's hardware, while generic operating systems will function on the hardware of many different vendors. Obviously, generic operating systems, in providing the ability to run the same compiled software on different vendors' products, have become important in determining the distribution channels for software and the popularity of hardware systems. It is reasonable to infer, then, that proprietary operating systems will have a difficult time succeeding in the marketplace unless the hardware has particularly good application software features. The implications for these vendors are clear. Table 3 on Page 24 contains a listing of some popular operating systems.

Digital Research's Control Program for Microprocessors (CP/M) was the first of the popular generic operating systems available for 8-bit computers using the 8080 family of microprocessors (including Z80, 8086 and so on). CP/M was patterned generally after DEC's RSTS minicomputer operating system. It currently is available on over 200 models of microcomputers and has become the de facto standard for 8-bit operating systems. Many hardware manufacturers have been able to bring their microcomputers to the marketplace very quickly because of the existence (and modularity) of CP/M and the general availability of software packages running under the CP/M operating system.

One of the great debates currently raging is "Is CP/M dead?" CP/M is often seen as the masthead of the 8-bit world, and this question arises because of the proliferation of 16-bit micros, which threaten to crowd out the 8-bit systems. The question really should be "Is the 8-bit world dead?"

The answer is "No!" at least in a two- to three-year time frame. Currently, 8-bit machines perform many functions very well and at a cost significantly below the 16-bit systems. It makes little sense to spend extra money for a 16-bit machine if all the functionality required for a particular application is on the 8-bit level.

Certainly, as prices drop, users will be getting more bang for the buck. Full-blown 8-bit machines will become available at lower prices; as a result, more organizations will be able to take advantage of the power of micros. The 8-bit world — and CP/M — should therefore be with us as the low-end market at least for the near term.

Looking to the rest of the '80s, we expect that users will not have to know which operating system they are using. The operating system will be increasingly transparent to the application and to the user. Several operating systems will probably survive on the 16-bit level, including CP/M-86, Unix and the UCSD P-System. These systems will provide the core for the stand-alone and distributed processing workstations of the 1980s.

Management surely recognizes that information and the means to get at that information constitute vital organization resources. As micros become more a part of OA systems, we must become acutely aware of both their power and limitations. In many organizations, management (including DP

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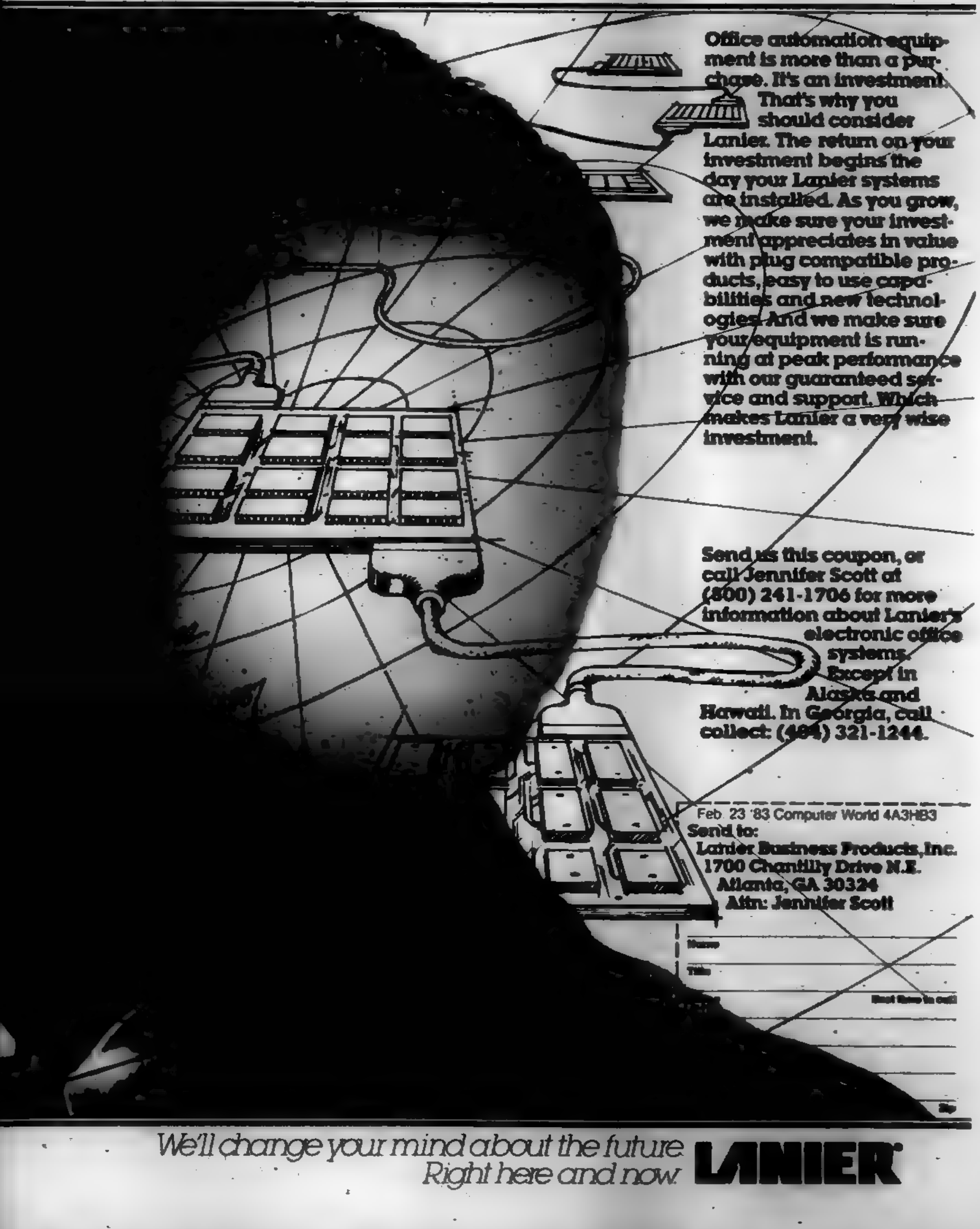
Tom Anderson, National Marketing Manager,
Electronic Office Systems Division



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Appledos		Apple	Proprietary
Trsdos		Tandy Corp.	Proprietary
Hdos		Zenith Data Systems Corp.	Proprietary
CP/M	CP/M — 86	Digital Research, Inc.	Portable, single user
MP/M II	MP/M — 86	Digital Research, Inc.	Multiuser
	MSDOS	Microsoft, Inc.	Developed for IBM Personal Computer
UCSD P-System	UCSD P-System	Softech Microsystems, Inc.	Very portable, uses concept of pseudo machine
	Unix	Western Electric Co.	Originally developed for minicomputers
	Xenix	Microsoft	Unix look-alike
Oasis	Oasis-16	Phase One Systems, Inc.	Single or multiuser systems

Figure 3. Available Operating Systems

management) pays very little attention to the management of information and technologies or to supporting technological innovation.

The rapidly changing technologies require that those at the upper levels of an organization must become more familiar with the technologies and manage — not control — the spread of microcomputers.

Many managers do not fully realize the implications of implementing micro-based OA systems. They assume either that goals stated in general terms can easily be translated into a microcomputer implementation (based on all the success stories appearing in the trade press), or that nothing should be implemented because the technologies have not yet matured. Management (and staff) must be educated regarding technological alternatives.

Further, management should not control the use of micros for OA; rather, the use of micros should be properly managed. Control implies limitation — the antithesis of the concept of a personal computer — and may well be resisted by users attempting to satisfy the requirements of their particular function in the organization. It is inappropriate to define the best hardware and software systems for an organization. The edict approach does not recognize the rapidly changing nature of the microcomputer industry.

To be sure, management should have real concerns about the use of micros. Most of these concerns should be addressed by policy statements. Microcomputers should be thought of as nothing more than office equipment, like electronic typewriters. Micros are only tools to be used by management, staff and support personnel. The acquisition of a micro should therefore be tied to a real business need and should be able to fulfill that need in a cost-effective manner.

Many microcomputers in the office will continue to be primarily stand-alone application systems — whether it be WP, financial or production modeling or forecasting. For these types of systems, management should set general policy guidelines for equipment acquisition. These guidelines might include such things as recommending (but not mandating) specific equipment for acquisition, purchasing procedures, training requirements and suggestions for packaged software.

For computers that will be connected to a host mainframe or interconnected via local-area networks, management must set both general and specific guidelines. For instance, data access and privacy issues must be addressed (and therefore, access to the network or host must be properly controlled). Also, physical access to the microcomputer hardware and data storage floppy diskettes must be controlled in some manner (at minimum, by storing vital program and data disks in a safe place).

In all cases, management should support the education of employees with these new tools, encourage formal and informal corporate communications (including underground newspapers, if necessary) and inform the organization of changes in policy and major development projects under way.

The points to be conveyed to management are:

- There is a need to understand the rapidly changing nature of the micro technologies.
- There is a need for management to be flexible in dealing with the growth of micro technologies within their organizations.
- Access to information should be *controlled*, but the hardware/software solutions should be *managed*.

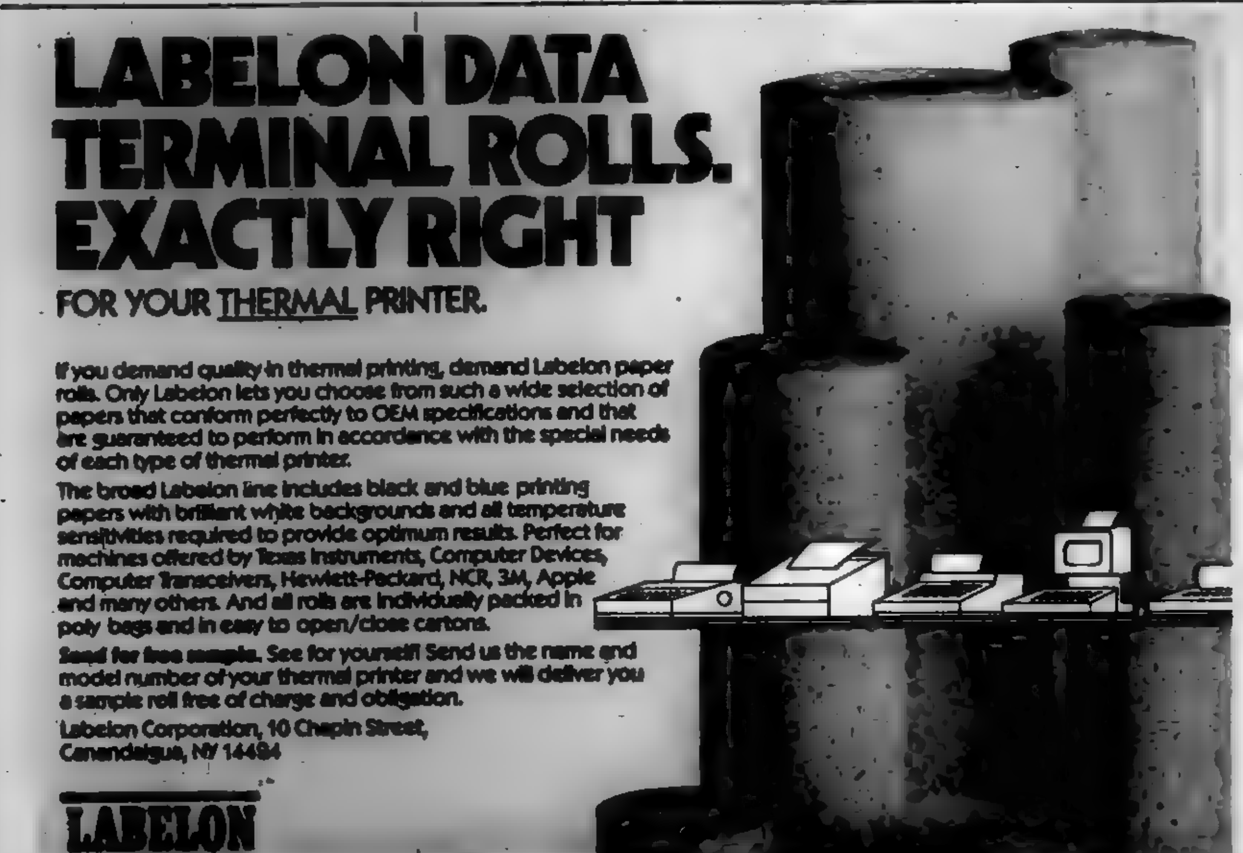
Micros are becoming firmly entrenched in our OA systems — whether as stand-alone or interconnected application processors. They have achieved recognition as truly functional workstations. Furthermore, the available software demonstrates an understanding of what users need to help them improve their work product.

The next two to three years we will see the widespread use of 16-bit machines and the introduction of 32-bit architectures. The 8-bit world is not dead; its universe, however, has been redefined. It will now serve the low-end, entry-level marketplace. The 3-in. rigid floppies will proliferate and the cost of hard-disk drives will plummet.

Software is moving toward supporting an integration concept in virtually every application area. Combining the new software technologies and support of many communications protocols will put microcomputers in the forefront of the multifunctional workstation marketplace. Micros will become an increasingly important part of local-area network implementations. Microcomputer-based graphics systems will become vital elements in the modern automated office.

Management will be responsible for supporting, if not spearheading, the proper implementation of micro systems in the office. This support will take the form of general and specific policy statements, providing technical support through the DP department, setting certain guidelines for purchasing micros and hooking into local networks or the corporate mainframe. OA

Mazursky is a management consultant with the New York office of Deloitte Haskins & Sells. He works with clients in implementing microcomputers in their organizations, developing corporate policies and MIS strategies, and designing and implementing production, MIS and decision support systems. He is a member of his firm's microcomputer task force.



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Beyond Word Processing

Users are searching for migration paths as they move beyond single-application functions and head toward integrated solutions.

By Amy D. Wohl

Word processing was the first office automation technology to gain broad acceptance and usability in the business community. To many, it seemed — and in fact still seems — to be the only OA technology. Most of us, particularly in large organizations, have already made considerable and long-standing investments in word processing.

But office automation is not word processing, although it does include the office function of creating and manipulating text. To explore ways in which organizations can and should expand into OA from existing WP bases, let's examine some OA requirements.

- OA offers a full set of functions to support a wide variety of office tasks. These functions include not only WP, but also electronic mail, including messaging and document distribution; electronic filing; administrative support such as

"Difficulties from an organizational/ psychological point of view may be encountered if professionals, managers and executives resist a system they perceive as an extension of a clerically oriented system."

calendars, scheduling, reminder systems, telephone and mail logs and so on; personal computing and decision support; business graphics; and the ability to access data on both internal and external data bases.

- OA offers this functionality to a broad set of office workers, including secretaries, administrative staff, professionals and managers (including executives).

Some systems support only horizontal slices of the office population — for example, word processors for secretaries, or microcomputers with Visiclone software for professionals in planning jobs. Such systems tend to enhance the performance of a specific worker in a specific task, but they fail to incorporate that enhancement into a system where information can be further supplemented by the ability to share it in meaningful ways.

In fact, in this preautomation period, individual electronic tools may actually isolate workers and make certain tasks more difficult. If you doubt this, take an information poll in your organization. Ask how many professionals and managers, on their own, could locate, edit and print out a document currently located within the WP system.

- OA enables proliferating functionality and access (this means individual workstations) throughout an organization. It requires not only a sufficient number of workers to ensure the occurrence of a sufficient volume of interesting interactions, but also the right selection of workers. In the building stages of an OA system when every worker is not yet on the system, all workers who share a set of information need also to share the system.
- OA requires interconnection. OA does not occur when every worker has his own individual personal computer, although it is perfectly possible to build an OA system out of adequately interconnected personal computers. In order for OA requirements to be satisfied, these individual workers must be interconnected. This interconnection allows the implementation of office functions such as electronic mail and information sharing through shared files and data bases.

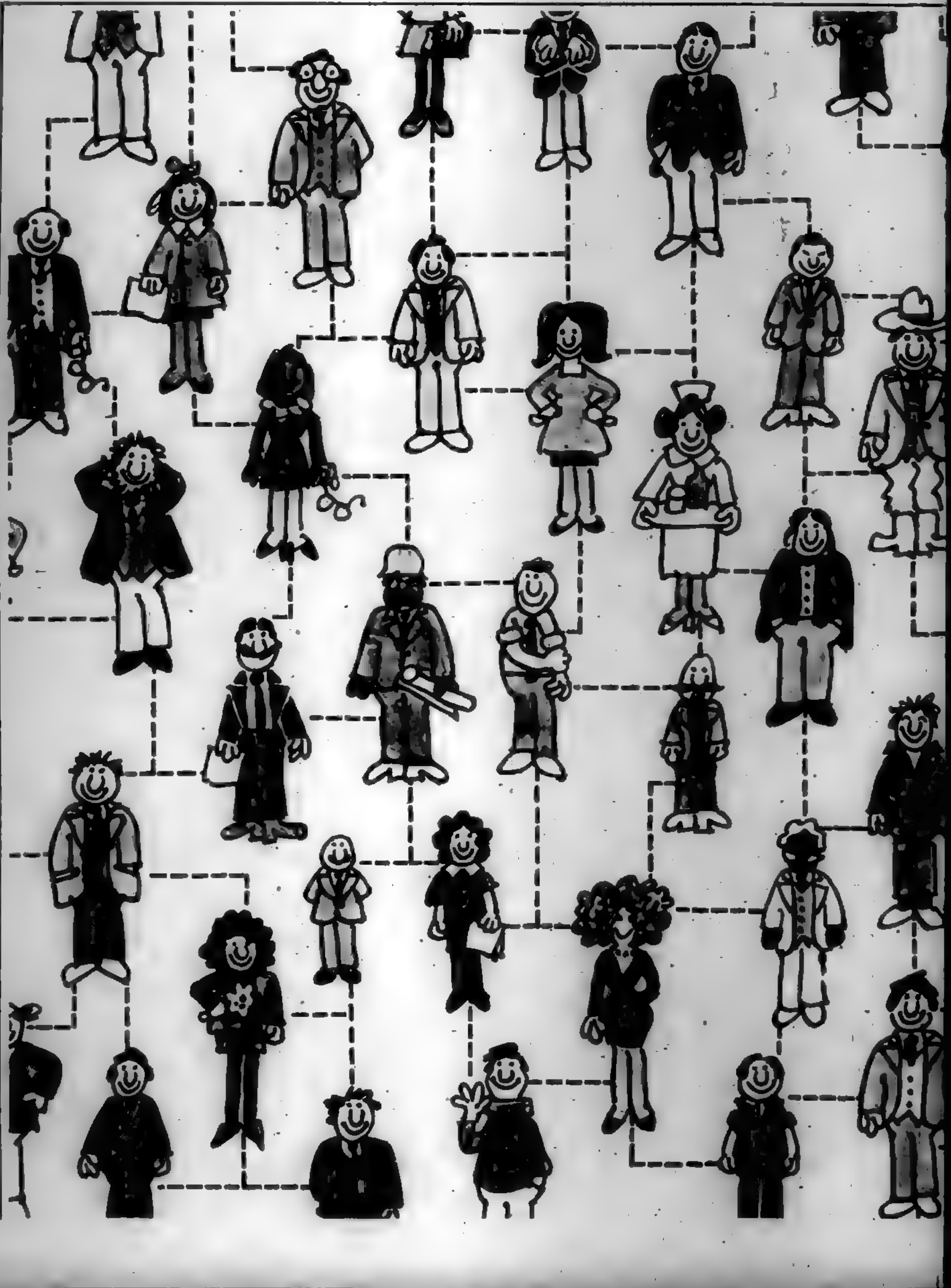
From a hardware point of view, it is perfectly possible to "grow" an OA system from appropriately functional word processors by means of additional function and additional users (and, therefore, more workstations). However, such direct growth may be psychologically difficult or overly expensive.

Difficulties from an organizational/psychological point of view may be encountered if professionals, managers and executives resist a system because they perceive it to be an extension of a clerically oriented system. Also, systems that grow directly from a WP hardware base may overemphasize word processing at the expense of management-oriented functions such as data access and use, decision support and business graphics.

Difficulties because of expense stem from the fact that typical stand-alone word processors (with printers) now sell for $7,000 to $14,000 each. Microcomputers with professional or managerial/professional software can be purchased for as little as $2,000 each. It is more realistic, however, to anticipate levels of $3,000 to $5,000 plus printer, with WP printers costing just under $3,000 each in the microcomputer market.

Multiworkstation WP systems generally average out to about $20,000 per workstation when configured with adequate storage printing. This may make the cost of a professional or managerial workstation higher than desired, when additional WP workstations with suitable software are used as the engine for direct expansion into OA.

How then can organizations expand into OA from a WP base



without burdening themselves with the problems of overemphasis, incorrect perception or expense mentioned above? A smooth migration from a preautomation technology like word processing to the additional productivity offered by OA requires an in-depth understanding of the office work place, its function and the skills and limitations of its workers. Within organizations that have invested in word processing, particularly within those organizations that have also invested in a considerable infrastructure to support technology, a great deal of knowledge and experience exists.

> ***"A smooth migration from a preautomation technology like WP to the added productivity of OA requires an in-depth understanding of the office work place, its function and the skills and limitations of its workers."***

This accumulated knowledge and experience relates to the work the office performs and to techniques that have been successful in a particular organizational culture for encouraging the acceptance of technology. The managers and analysts who have participated in the design, implementation and on-going management of the WP system represent a seasoned core of trained workers who should be important participants in the design and implementation of the OA system.

Most organizations that are looking at or planning for OA support this process through the formation of an OA task force or committee. Obviously, WP management should be a strong participant in this task force or committee. The committee should also include participants from DP, telecommunications, administrative management, personnel, facilities management and corporate planning.

In some sense, word processing will, as a primary function, speak out for the need for the OA system to provide a strong WP capability, fully compatible or at least readily convertible to the existing WP system. But this is not its only function. For many organizations, word processing represented the first attempt to bring about the successful use of computer-based technology by office workers who did not (at least initially) think of themselves as DP professionals.

As a result, WP should be able to provide the task force with valuable insights into this problem, particularized for the peculiarities of the organization. It is important to note that these insights will focus on the fears, abilities and eventual successes of skilled clerical workers (generally typists and secretaries). Other sources must contribute information on the fears, capabilities and business needs of other populations, such as professionals and managers.

The WP experience has at its heart another, quite different, preautomation benefit. Firms that process most of their words through WP systems have an enormous portion of their files already stored electronically. Often, these WP files are thought of quite separately from the formal — and normally paper — filing system. Nevertheless, this stored information provides the basis for the start of an electronic filing system.

In addition, most WP workstations are or can be equipped as communicating devices. This makes them immediately usable as electronic mail stations, provided the OA designers pick a system that will accommodate them. In organizations with considerable inventories of existing word processors, the ability to continue to use existing (and presumably already paid-for) equipment can be an important part of the system's initial cost and its cost-justification.

Of course, if the vendor of the firm's installed WP equipment is vigorously pursuing the OA marketplace, the WP system may seem to be the obvious base for the OA system. Please keep in mind, however, our previous caveats. If the system is perceived as a clerical system; if the equipment serves word processing well, but is not a fully functioned OA offering; or if the cost of adding work-

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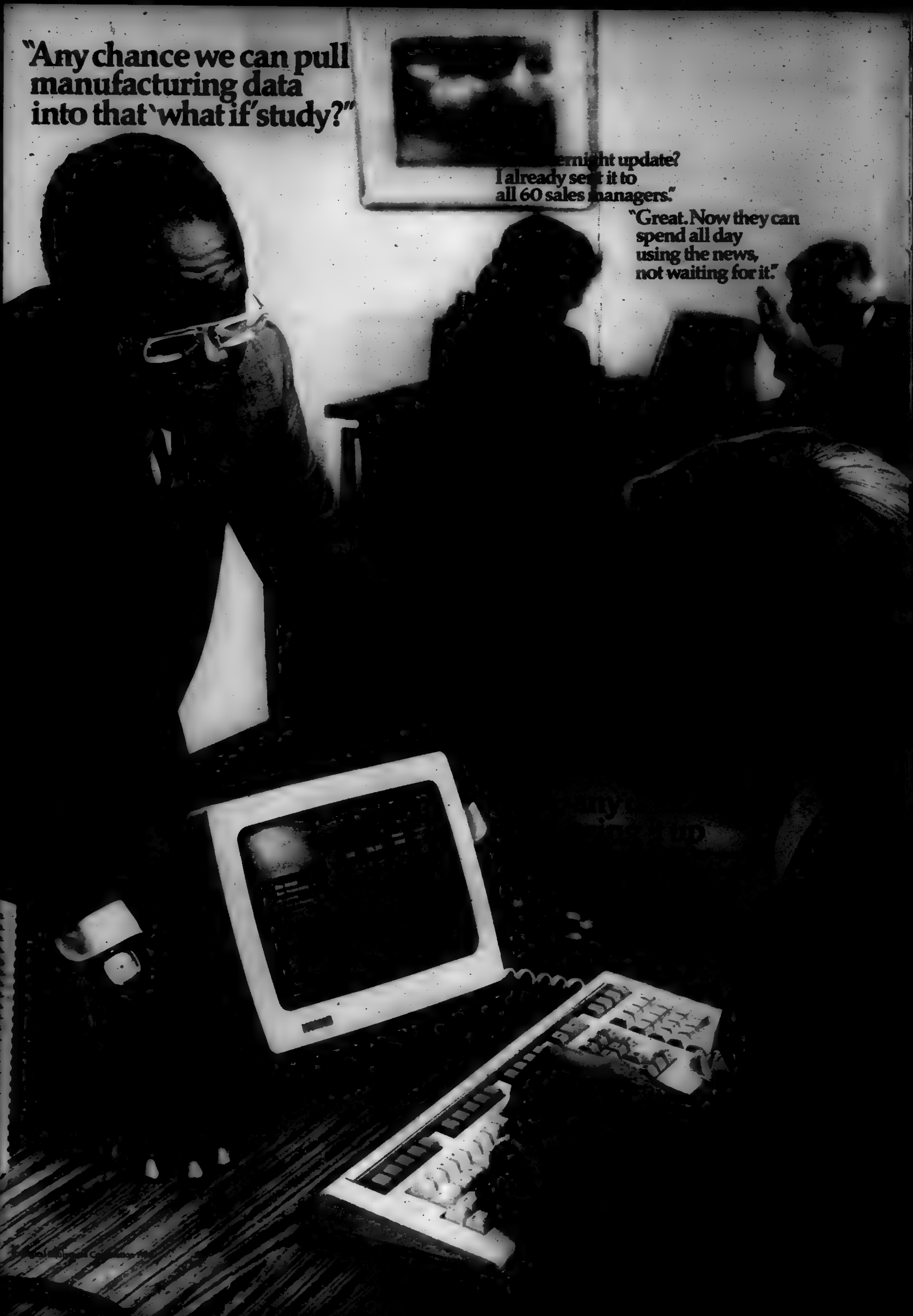
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> ***"Assume that some compromise is necessary initially — less OA function, less WP function, some incompatibility or expensive workstations. No system offers everything yet!"***

stations is excessive relative to other design alternatives, then the ability to leverage existing hardware may not be a sufficient benefit.

In the last year, something new was added to the OA formula. That something is the strong appearance of personal computers throughout American businesses, particularly on the desks of professionals and managers. The rapid proliferation of these desktop workstations will increase at astronomical rates over the next few years. This proliferation will not wait for the results of our OA experiments. Personal computers will shortly exist in such numbers that no future OA plan will be able to ignore them. In fact, for many firms, it is likely that the OA workstation will be a personal computer.

This may mean an essential change in the way we perceive possible paths to OA and the relation between WP and OA. We currently have approximately one million word processors in use. Many of them represent very old technology, dating back to the mid-'60s. By 1985, the number of personal computers being used in large companies will exceed the number of WP workstations in those same companies. (We will, of course, continue to add word processors, but at a rate much slower than that of personal computers. It has taken nearly 20 years to get those word processors in place, and almost all the word processors ever created are probably still in use somewhere.)

When the number of personal computers in the hands of professionals and managers (mainly for personal computing, decision support — especially Visicione usage — and data access) substantially exceeds the number of word processors in the hands of WP operators and secretaries (mainly for text manipulation and some departmental records processing), then it will be time to rethink the relative importance of the various parts of an OA system. The migration to an integrated OA system has quickened since word processing became standard operating procedure in the office. In the beginning, we thought the most important part of any OA system was the part that replicated the task we had already somewhat automated — text. We sneered at systems that offered less than full-blown word processing, even while we noted that many system users would not employ this facility.

Next, in a middle period, many systems offering less than full-blown word processing will be (and are being) installed. This makes them less useful because they generally cannot replace the WP system, but must somehow exist beside it. In poorly thought out systems, word processors (the people) are forced to accept less function than they had before, which in most cases is a bad solution. Another consequence of this lack of thought is that two incompatible systems live side by side, while someone gets to do a lot of rekeyboarding. A third bad result, also to the users' detriment, is that the systems don't know much about each other's contents.

The end of the middle period is marked by the design of transfer mechanisms. These mechanisms make it easier (or at least livable) to put two incompatible systems — WP and OA — side by side and to assist the user in transferring information from one system to another. The IBM Document Interchange Architecture (DIA) is an attempt to treat this problem within the IBM product set. Multivendor solutions can be expected from other vendors soon.

Such solutions are useful, but they fail to address the problem completely. It is an unpleasant but immutable fact that all such transfers and transformations are necessarily incomplete. The system can handle with agility only those functions that both systems include; for any functions that exist on only some of the systems involved, only a print image (with no editing codes) can be passed. The result is that something less than full editing in a smoother and seamless environment is being offered.

What follows this middle period? Ultimately, we will want systems that include both superlative word processing and a full set of properly implemented OA functions. Such a system will not compromise either community of users — at least not too much.

It will also take into account the fact that nearly everyone will want to process words sometimes. Some of us will be skilled WP operators with high skill levels and the need to handle complex activities. Some will be infrequent users, seeking only to get our thoughts down on electronic paper with an eye to allowing the skilled WP professional to edit, format and formalize our output later, much as those functions are provided for professionals today.

From a nitty-gritty real-world point of view, what do we need to know and do to get beyond the WP systems we have today and move toward the OA systems that offer such promises? We need to do the following:

- Understand that office automation means providing a full set of office functions to every office worker. It means providing each office worker with an individual workstation interconnected into a supportive, enveloping environment for communication and information sharing.
- Understand the role the personal computer will play in speeding up the advent of OA and its proliferation. As this proliferation occurs, the focus for OA and the relative perceived importance of various systems functions will shift.
- Plan for OA with a task force or committee that includes all the relevant technologists in the organization. Include the expertise of word processing, but understand that it is important to the success of the ultimate office system that it not be perceived as an extension of the clerical system and, therefore, as a system for clerks.
- Take existing WP hardware into account in designing an OA system. It may help save money and proliferate more quickly. On the other hand, don't let it bias selection activity too strongly — other considerations may be more important.
- Assume that some compromise is necessary initially — less OA function, less WP function, some incompatibility or expensive workstations — no system offers everything yet!
- Hope — I want to say assume, but I'm afraid to — that systems get cheaper, more compatible and much easier to use.

Remember, every time you vote with your purchasing dollars to buy a good system or pass up a bad one, you help to encourage this process. OA

Wohl is president of Advanced Office Concepts, an OA consulting firm for vendors and users, based in Bala Cynwyd, Pa. Wohl is also editor of the "Advanced Office Concepts Newsletter."

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It's a Jungle Out There

Users coping with automation may feel lost in a jungle of data. The Information Center can help them find their way back to civilization.

By William Clarke

As microcomputers and user-friendly software tools for non-DP personnel proliferate, more institutions are discovering they need to support end-user computing. Some label their new strategy an "Information Center"; others attempt to incorporate it into their traditional applications development process. Of the two approaches, the Information Center concept is proving to be the more successful long-term strategy. End-users are beginning to carve out a place in the modern organization, and

ILLUSTRATION BY TOM BARRETT

management information services departments must meet the challenge by establishing specialized departments to support them. The Information Center is a department that will train end users to access their own data and generate their own reports. Some 42% of large IBM installations have already implemented the concept.

The key idea behind the Information Center concept is end-user self-sufficiency. In many organizations the backlog of applications has reached staggering proportions. It is not uncommon to hear of backlogs spanning three years and longer. The Information Center provides an effective method for cutting through the backlog.

In a well-organized center with good data administration support, some 70% of the requests from end users can be satisfied using on-line report generators and query languages. Most installations already have some kind of internal time-sharing facility. Seventy percent of IBM sites have some internal time-sharing software. This is up from just 33% three years ago and should climb to well over 80% in 1983.

The time-sharing facility is often used exclusively by the programming staff of the MIS department for on-line programming and debugging. When an Information Center is established, many installations simply expand the existing time-sharing facility and allow end users to access their own data with user-friendly report generators, query languages and graphics software.

Over the past two years, many organizations have established Information Centers with varying degrees of success. Those that have been the most successful with the concept have kept most (if not all) of the following points in mind.

The charter of the Information Center is to improve the productivity of the organization. In these times of economic stagnation, organizations are being called upon to accomplish more with fewer resources. If the center's charter is to improve end-user productivity, its orientation will be more forward looking and the staff will make a longer term impact on the profitability of the organization. Short-term objectives should not become the mission of the Information Center.

In one organization, for example, the "mission" of the Information Center was to bring all existing outside time-sharing applications in-house. In its first two years of operation, the center saved the organization $1.5 million. It had successfully achieved its objectives.

There were two unintended consequences, however. After all the time-sharing applications were converted, the Information Center ceased to have a clearly defined function. As a result, the support for the end users deteriorated, and many felt they were better off returning to the outside services. The center would have been more effective if the original mission had been to improve productivity, and a short-term objective had been to convert outside time-sharing applications.

Treat your Information Center as though it were a business. Information Centers that consider themselves a business within a business are much more successful in managing their resources and gaining the support of their end users than those that consider themselves just another specialized support function within MIS. The latter tend to be not so responsive to end users and to have a more difficult time justifying their budgets. What does it mean to be a business within a business? Here are three key elements:

- The Information Center budget is based on the amount end users are billed for the services they use.
- A walk-in center and a formal method for training and supporting end users are implemented.
- The center actively markets its services to end users.

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User departments should be invoiced for the computer resources (compute and I/O) and other services they use. Some organizations have sent out sample invoices the first year of operation in order to provide their users with some basis for budget planning. If the center's budget is based on how much its services are used, it is easier to justify budget increases and to muster support from end-user-departments that want more services. By sharing the expense of the Information Center, it becomes a company resource.

A walk-in center and a formal method for training and support gives the users easy access to terminals, plotting devices and user reference manuals. It also improves the visibility of the Information Center. Ideally, a formal classroom for training end users should be set aside with a schedule of training sessions.

Most successful Information Centers take an active interest in promoting their services through the use of slide presentations, seminars, articles in the company newspaper, internal mailings and demonstrations.

Segment your market and identify a niche. It is a good idea to survey your potential growth. The results may be surprising. One organization found that 48% of their potential users had some first-hand computer experience, even though only 19% used computers in their jobs. Some 75% felt on-demand computer services would help them to be more productive in their current positions.

The survey should point out the alternatives end users have selected to meet their applications needs. Some will have acquired a personal computer, others will be using outside time-sharing services and still others will have purchased stand-alone minicomputers for word processing and data handling.

Many organizations are spending more on user-purchased hardware, software and services than they realize. One large manufacturing company discovered that end-user purchases accounted for 40% of the total dollars spent on hardware, software and services. In some instances these dollars were well spent; in others, they were redundant to what was already available. The Information Center should adopt a strategy that fits smoothly into the way user departments are currently operating. Users should not be forced to convert to the Information Center service if it will impair their productivity or cost them more.

Hire and train the best people for the job. The Information Center staff should be selected for their people skills and business experience rather than for their technical knowledge. The best people for supporting end users are not always those with the heaviest DP experience. Indeed, it is sometimes the individual with no previous programming experience who develops into the most versatile and reliable support person. Over time they will become expert in the software packages and data that is available through the center.

As any good entrepreneur will tell you, product knowledge is the key to a successful enterprise. The Information Center is no different. Take extra care in training the center's staff in the software packages that will be offered and on the procedures for securing access to the data requested by the end users. The support staff should be able to teach end users how to use the center's services. They should also be able to present the benefits of the Information Center. Have them practice demonstrations and presentations that will sell end users on the center's services. Tests have shown people tend to have more enthusiasm for an idea after they have made a presentation to someone else about it. The center's staff will become more enthusiastic about their role as they sell end users on the Information Center concept.

Select general-purpose, easy-to-use software. Start with tools that have the greatest versatility and add specialized packages as the market develops. Too many specialized software packages, each with unique features and syntax requirements, will confuse end users and put a strain on the support staff people who have to learn them all. Many Information Centers are built around three generic types of software:

- A fourth-generation language, such as Nomad 2 or Ramis II.
- A financial analysis package.
- A natural language query facility, such as Intellect.

The fourth-generation language usually does most of the work for end users who want a tool for general problem solving. The financial analysis package will answer the specialized needs of budgeting and financial planning. The natural language query facility is extremely useful for providing demonstrations to top executives and management. In one company, the whole Information Center concept was sold on the basis of a natural language facility that was demonstrated to the chairman of the board and the board of directors. All the packages should have good documentation and training materials designed for end users.

Whatever packages are selected for the Information Center should also be available on an outside service. This will allow the center to use the outside service as a backup or to handle applications that cannot be supported easily with existing in-house resources. One installation decided to bring all its new Information Center users up on outside time-sharing before bringing them up on the in-house machine. This gave them an opportunity to evaluate the resource requirements of a user's application before committing to it.

Develop detailed procedures for securing access to data. An Information Center that cannot provide its users with the data they need is like a restaurant that does not serve food. Data is your most important asset and the most difficult to control. Well-thought-out procedures for controlling the accuracy and currency of data should be put in place. Some detractors of the Information Center concept feel it will eventually founder on its inability to properly administer data. With end users creating their own reports and accessing their own data, every effort should be made to avoid two users coming to different conclusions because of faulty data.

In general, it is not a safe practice to have end users directly access live operational files. Users should speak to the Information Center staff about the data they need. In many cases, the user's request can be satisfied using the current inventory of query files maintained by the center. If the request requires a new set of data, the user should then fill out a formal request. The center's staff should obtain the appropriate authorizations and arrange to have the data prepared as an extract file. Preparing the extract file includes ensuring the data is clean and current. As production systems develop and change over time, it is not unusual for certain data fields to become obsolete or to change their meaning.

For example, the number of work hours for exempt employees may, over time, have become a meaningless data item, even though the labor reporting system still puts a value in the field. Or data values may be in a format suitable for sorting purposes, but misleading to an uninformed end user. When a new extract file is created, it should comply with standards maintained by the Information Center and the data administration function of the installation. Once created as a clean set of data, an extract file can be added to the inventory of query files maintained by the center's staff. The query files should all have standard documentation that describes the data items and standard data formats.

Keep success stories flowing up to management and out to potential users. Successful Information Centers make an effort to keep themselves visible to their markets by pointing to their successes. It is useful to point to the number of user IDs, amount of computer resources used or volume of support calls answered. These are relatively easy measures of Information Center activity, and almost every installation we have spoken to collects and summarizes these figures on a monthly basis. The figures are evidence that activity is taking place, although they do not necessarily mean that useful activity is taking place.

More to the point, and much more effective, are case histories of applications end users have written themselves. These success stories should be publicized. One organization went so far as to rent a ballroom of a major hotel to stage a "trade show" featuring the applications of the Information Center users. In the two days the show ran, several thousand company employees attended and learned about the wide range of applications the center was able to address.

The Information Center concept has proven to be a valuable and important step forward. With the software tools available today and the greatly improved cost/performance ratios of hardware, many MIS departments have shown they can greatly improve the productivity of their organizations by putting the right tools in the hands of the right users. OA

Clarke is senior product manager for National CSS, Inc., a company of the Dun & Bradstreet Corp. Headquartered in Wilton, Conn., Clarke has frequently worked with users setting up Information Centers.

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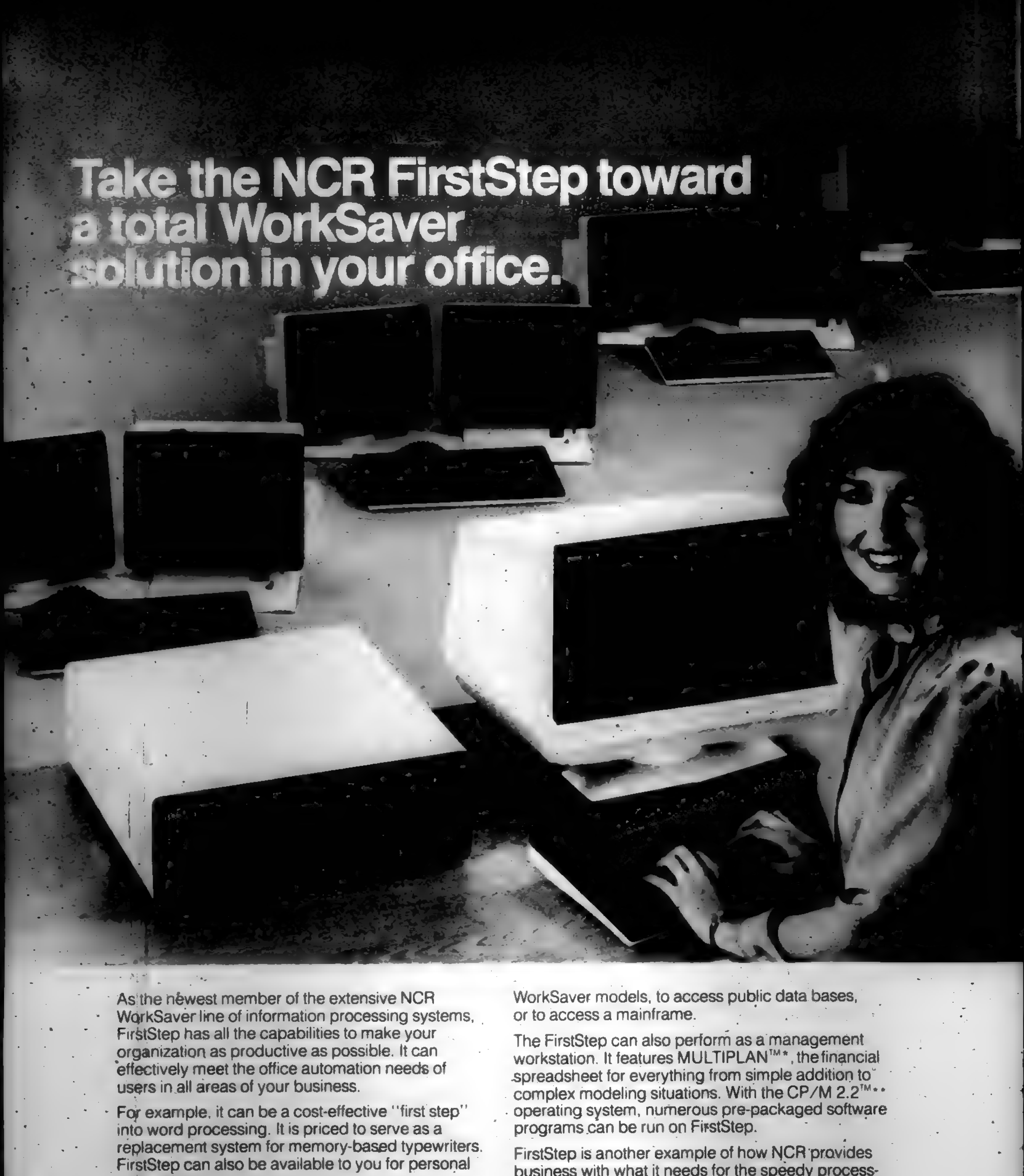

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The New Office: More Than You Bargained For

What's good for the organization may not necessarily be good for the employee. What can be done to help both?

By M. Lynne Marcus

Both users and vendors are interested in the impacts of office automation. Users want to benefit from OA while preventing resistance and disruption; vendors want to incorporate selling features into their designs while avoiding bugs. Although general agreement exists on the importance of the impacts of office systems, there is little agreement about which kinds of impacts are important.

Computer-based applications, which include OA as a special case, are believed to affect a daunting array of human and organizational characteristics. A partial list includes:

- Job characteristics.
- Job satisfaction and quality of working life.
- Psychological reactions.
- Health and stress.
- Organizational centralization or decentralization.
- Power and politics.
- Communication channels
- Employment.

Research has demonstrated that computer-based applications sometimes have impacts on these attributes. But the research is sketchy and leaves many questions unanswered. Its relevance to office systems is

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frequently unclear. Two conclusions do emerge, however:

- Office systems must be considered on at least two levels: their effect on individuals and their effect on the collections of people we know as organizations. It cannot be assumed that the effect of an office system on an organization will be the sum of its effects on individual workers. Nor can it even be assumed that a system that benefits individuals will benefit their organization and vice versa. For example, an office system may increase productivity to the point where the organization experiences a lower cost of sales and higher profit. At the same time, however, it may achieve these benefits with fewer workers, thereby reducing employment opportunities inside the firm.
- Office systems must be considered not just for their impacts on what people do when they work, but also for their impacts on how they work (and how they feel about this) and where and when they work. What people do when they work can be called the work task. Office automation is widely believed to make work tasks easier and faster, thereby contributing to organizational productivity.

But productivity is also a function of how tasks are distributed among people and how well people work together to accomplish them. This means that the social aspects of OA are as important as work task impacts. The social side of work results from people interacting in space and time. OA promises to alter these interactions by replacing synchronous with asynchronous communication. This dimension must be considered in addition to task and social impacts.

These conclusions yield a broad framework for examining the potential and actual impacts of OA (see Figure 1). Along the top are the three relevant aspects of organizational life: work task, social aspects and space and time. Down the side are the two levels of impact: individual and organization. Each of the six boxes contains at least one positive or negative impact which can result from the use of office systems. The remainder of this article will examine each area of impact in turn.

Job characteristics and employment: One of the most persistent claims for OA is that it reduces the length of time required to perform certain tasks — typing and revising manuscripts, distributing documents and so forth. Various benefits are expected to derive from this. The individual is expected to be able to perform the simplified tasks more often per unit of time or to be able to use the resulting free time for performing other delegated or self-initiated tasks. This increase in the productivity of individual managers, professionals and clerical workers is expected to spill over into greater organizational effectiveness.

> ***"It cannot be assumed that the effect of an office system on an organization will be the sum of its effects on individual workers. Nor can it even be assumed that a system that benefits individuals will benefit their organization and vice versa."***

Unfortunately, the expected benefits do not always materialize. In the first place, office systems themselves may absorb some of the time and attention they save. Most people would admit this is true during the process of training on a new office system, but, as Rob Kling and Walt Scacchi have noted, automated systems also seem to create recurring hassles for their users. Users of office systems may be unaware of the time they spend making backup diskettes or creating parallel filing systems for hard copy and floppies, but the ongoing investments in time can be substantial.

In addition, some people may not enjoy the jobs that have been made "easier" by office technology. Jobs comprised of simple tasks, repetitively performed, are often made bearable only by the little things that slow down the unautomated environment — for example, having to lay out charts and tables by hand. By removing the need for thought, office systems may make some tasks more thoughtless, boring, fatiguing and, ultimately, error-prone.

This impact is compounded in

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some organizations by a tendency to design jobs that are specialized in a single task. How many firms restructured secretarial jobs into administrative and typing roles when they introduced word processing equipment? In many cases, the jobs created in this way are not only boring, they are also dead-end in terms of career progression. To use an example from an older technology, the promotion possibilities for keypunch operators were never very great.

Jobs comprised of hard-learned professional and technical skills are also vulnerable to inroads by OA. Decision rules and expert knowledge can be programmed into systems, thereby "deskilling" the jobs and allowing them to be filled by less highly trained (and therefore lower paid) individuals. This can reduce job satisfaction, career mobility and even employment opportunities for high-level technical and professional workers.

Level Of Analysis	Work Task	Social Aspects	Time, Place
Individual	Job characteristics and employment	Autonomy and control	Work at home
Organization	Productivity and composition of work force	Communication network and power	"Small is beautiful"

FIGURE 1. Framework of OA Impacts

Productivity and composition of the work force! Increases in individual productivity do not always translate into benefits for the organization. One reason is that individuals may fail to use their new free time to organizational advantage.

A more important reason is that most tasks are group activities, not individual activities. Consider the process of producing a report. One person writes a draft, another types it and mails it to a third for editing. The document is retyped, reissued, revised again and so on. Improving the productivity of one individual in the report production chain — the typist, for example — is unlikely to have a noticeable effect on the productivity of the entire process. For this reason, organizational effectiveness needs to be considered quite apart from individual productivity.

Properly conceived and implemented office systems can produce remarkable improvements in the productivity of organizational processes. A research laboratory in an oil company was able to speed up production of its major product (reports) through the use of OA. Each professional (as well as secretaries and WP center typists) had direct access to powerful text-editing tools. Some of the professionals composed documents on-line, finding it no more difficult or time-consuming to combine the activities of writing and data input. Others sent their drafts to the WP center for key entry. But most would edit their own documents and electronically distribute them to the relevant reviewers. Reports got done faster and better than formerly, and professionals believed they received better secretarial support. At the same time, however, this laboratory significantly reduced the ratio of secretaries to professionals.

What occurred in this research lab is both paradoxical and highly significant. Contrary to the claims of major vendors, office systems at this lab did not take $10,000-a-year work off the desks of $40,000-a-year professionals. Rather, it did precisely the reverse. Professionals did more of their own clerical work, but they did not experience it as such, because automation made the tasks easy and increased professionals' control over the entire process. Automation did this by changing (in this case reducing) the division of labor — the number of people involved in performing an organizational process.

The flip side of this reduced division of labor could be changes in the composition of organizational work forces. Over time, fewer people may be needed to occupy specialized positions that are entirely clerical in nature. The indispensable jobs will be those that embody unautomatable professional and technical skills and knowledge. These people will use sophisticated office systems to capture and process data at the

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point of origin: redundant handling by data specialists will be eliminated.

Over the short term, this may benefit organizations by reducing labor costs. Whether benefits will remain over the long term is unanswerable, but some areas of concern suggest themselves. In most organizations today, the ranks of professionals and technical workers are disproportionately filled with white males; the ranks of clericals and data handlers, with minorities and females. What happens if the lower level ranks contract? Will opportunities for employment and occupational mobility among minorities and women be reduced substantially?

> ***"In most organizations today, the ranks of professionals and technical workers are disproportionately filled with white males, the ranks of clericals and data handlers with minorities and females. What happens if the lower level ranks contract?"***

Autonomy and control: Work is not only or primarily an individual activity, it is also a social activity. Workers relate with their bosses, with co-workers on a specific task and with other individuals who share their time and place of work. OA has the potential to alter all these social relationships with far-reaching consequences for individuals.

Workers differ significantly in their social needs. Some prefer to work alone; others abhor it. But all workers require a measure of control over their own work. In order to learn and improve their performance, they need to see the results of their efforts and know when they are doing well or badly. Office systems can collect, summarize and report to the individual the data essential to monitor and control his performance.

However, office systems can just as easily report this data to someone other than the worker. In so doing, office systems can be used for control over people rather than for self-control.

Consider the ability of WP equipment to keep track of a typist's keystrokes per hour. One can imagine a novice typist using these statistics to gauge gains in speed from one day to the next. However, most systems that track productivity statistics do not make them available to the typist at all. Rather, they report them to a supervisor, who can then use them for external performance evaluation.

Too close supervision and too tight control over workers' behavior can result in stress, health problems and psychological reactions like powerlessness and apathy. Not only the quality of people's work life, but also the quality of their life away from work may be affected substantially. That automation increases the ability to exercise this control is clear from many published accounts. For example:

"Working at the [Traffic Service Position System at AT&T] terminal is easier than the old cord-board . . . This does not mean that operators have more control over their work; in fact, they have considerably less. With the cord-board, operators could regulate somewhat the pace at which they responded to calls . . . [The new system] means an operator can handle an unending succession of calls. There is no such thing as a full terminal.

". . . For half an hour, two times each week, every operator is timed by computer to determine her 'average working time' . . . Operators are evaluated on their 'speed of answer.' After the electronic beep, they have three seconds to respond to a call . . . Many still complain that the pace of their work has increased . . ." [Robert Howard, "Brave New Workplace," *Working Papers for a New Society*, 7, pp.21-31]

And, "Tuesday, 10:30 p.m.: The lone computer operator comes over to my console and says in a friendly way, 'If you're going to stay here, you'll have to get your productivity up.'

" 'Oh,' I say. 'What is my speed and what should it be?'

" 'It's been scientifically set,' he tells me, 'at 50,000 keystrokes an hour.'

"Then he sits down, plays a couple of chords on his control panel and up come my figures. The figures show — to the near-

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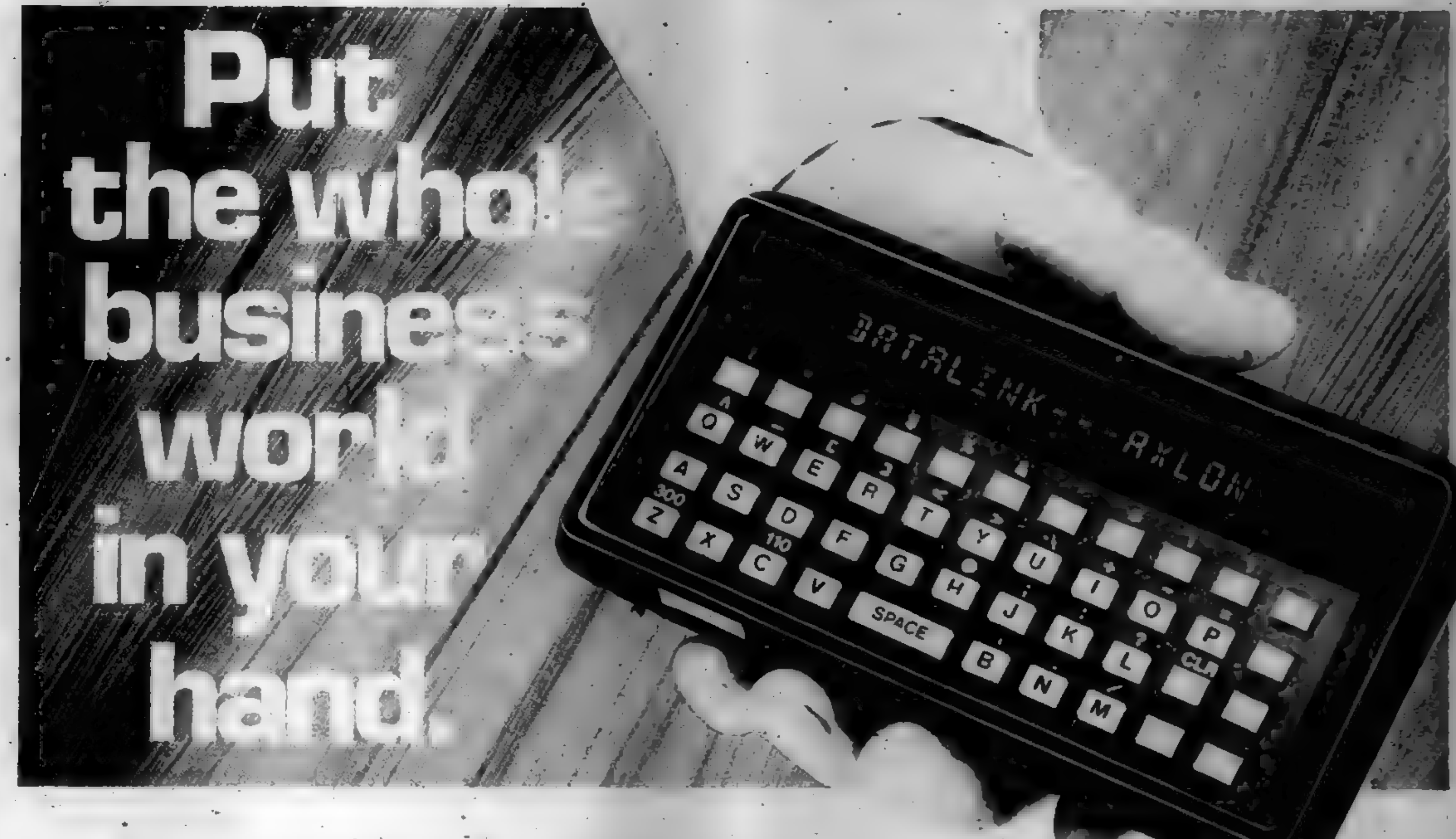

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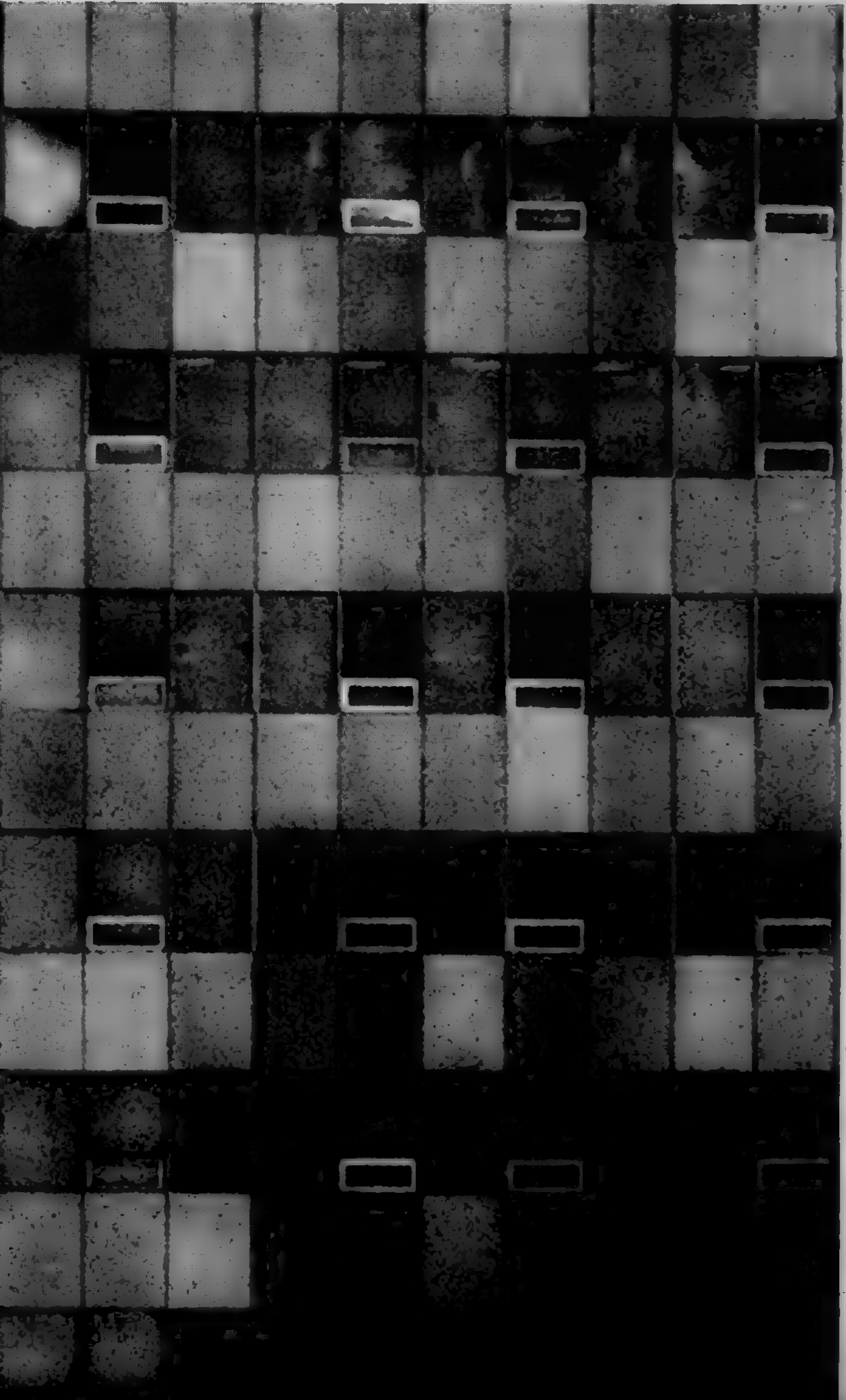

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est tenth of a second — when I started, when I took a break and exactly how many keystrokes I'd done all evening. (I am very far below the 50,000 keystrokes an hour.) The real supervisor is inside the machine." [Barbara Garson, "Overload in the Data Cluster," *This World*, June 28, 1981]

Sometimes excessive control over workers can engender resistance, misuse of systems and even crime by computer. Many examples could be given of these phenomena at work among managerial and professional employees, but my favorite example concerns office workers:

Industrial engineering methods were introduced into the office in the 1920s. In order to time-study typists, analysts fitted typewriters with mechanical dials that recorded keystrokes per unit of time. In *Labor and Monopoly Capital* (New York: Monthly Review Press, 1974), Harry Braverman points out that it did not take the typists long to begin using the space bar instead of the tabulator key to increase their stroke counts.

You'd think we would have learned by now!

Communication networks and power: Applications such as electronic message systems and computer conferencing are touted for their ability to improve the frequency and effectiveness of communication among people separated in space and time. Some studies are beginning to amass evidence that new office communication technologies encourage exchanges among groups that did not formerly communicate. It is easy to imagine how this might contribute to improved organizational effectiveness, for many examples are cited in the trade press.

The down side of this technology is more difficult to anticipate but equally plausible. In brief, controlling communications channels can give power to an individual or a group by restricting others' access to information or by selectively distorting the information transmitted. One way people and groups can currently maintain power is by laying out physical space to limit interaction (and therefore communication) with other groups. New communication technologies do not respect physical distance or organizational hierarchies. They allow and encourage each person to contact every other person. The result may be to undermine organizational power distributions and authority patterns.

IBM's Vnet offers an amusing, if sobering, example. Vnet is a network connecting 400 computer CPUs. IBM employees who use terminals in the course of their work can send messages to other terminal users over Vnet. The electronic mail capabilities of Vnet evolved almost accidently: IBM management did not plan or sponsor it. Today, however, Vnet could already be the world's largest electronic newspaper.

The designers of Vnet were working on a project that ran counter to the strategies pursued by IBM management. The people on the project believed strongly that it was useful, and they persisted in working on it after management disbanded the group and scattered its members to different geographical and organizational locations.

Vnet helped the group members to stay in touch with each other. Eventually, when they interested several customers in the product, they convinced management their idea was correct. Management reluctantly agreed to allow the product to be sold and earmarked funds for the necessary ongoing development. It takes little imagination, however, to guess that the leaders of the group had made themselves something less than popular with the authorities.

"The impacts of office systems do not result from the features of technology, nor from the characteristics of people and organizations. Rather, they arise from the way particular system features interact with a particular organizational setting."

The result was that people working on the project have had ongoing fears about their career prospects; many of them have left to join other firms. As concerns within the project group grew, Vnet once again figured heavily — this time as a way for people to exchange gripes about management and about their uncertain situation.

"Vnet has been used, among other things, for personal attacks on IBM management, to send job resumes and even to announce resignations, sources say. But, they add, a steady flow of less sensational and more constructive criticism of IBM has also surfaced on the network during the past year. Memos passed through the network claim that [DP Division] employees are increasingly working without adequate tools or computing power and with little or no merit incentives or career prospects.

" . . . Several months ago, Wheeler [an IBM systems programmer] decided to package together some of the Vnet 'gripe mail' into a collection . . .

"According to sources, Wheeler then removed the names from the memos and sent a copy of the package to each of IBM's top executives . . ." [Ralph Emmett, "Vnet or Gripenet?" *Datamation*, Nov. 1981]

Work at home: Many futurists have predicted that increased use of office systems and telecommunications will herald an era when many of us work at terminals in our homes, eliminating lengthy, energy-consuming commutes and incidentally lowering companies' bills for rent, maintenance, utilities and furniture. Other writers have been less sanquine about the benefits of working at home for individual employees.

For example, people working at home may become isolated from the valuable social contact and socialization processes that occur in offices. Supervision will need to change and will probably be more difficult than it is in face-to-face settings. In addition, while some workers may value increased time with their families, others may find this interaction personally stressful and hindering in their work. Working at home can disorient people who have relied upon the physical separation of settings for clues about appropriate roles and behaviors.

Small is beautiful: Whatever the benefits or harmful consequences it has on employees, widespread working at home is bound to have impacts on the organization itself. These impacts are highly speculative, but should provide some food for thought to corporate and manpower planners.

A perennial issue is whether an organization should have its own employees perform an activity or whether it should contract it out to an external agency. Because they have the incentive to do so, external agencies often perform the activity more cheaply; they may also do a better job of it. However, organizations may hesitate to contract some activities out because they fear losing control or becoming dependent on the external agency.

When large numbers of people work at home, organizations may feel such reduced influence over workers that they become willing to abandon the employer-employee relationship and to assume the contractor-contractee relationship. Organizations may thus become small agencies that contract with any army of subcontractors and self-employed individuals for most essential services. This would certainly change the management of organizations and the nature of work for many people!

The preceeding discussion of the impacts of office automation has had the flavor of the old good news-bad news joke. For every benefit of OA, a problem or negative impact has been identified or can readily be imagined. The bad news is that the benefits are not inevitable; the good news is that the negative impacts are not inevitable either. Things can be done to increase the likelihood of benefits and to reduce the chance of negative impacts. Unfortunately, the measures required go far beyond human factors engineering of office equipment and careful selection of system features.

The impacts of office systems do not result from the features of technology, nor from the characteristics of people and organizations. Rather, they arise from the way particular system features interact with a particular organizational setting. One consequence of this is that the same office system can have very different impacts depending on how it is configured and delivered in an organizational setting.

Configuring a system in an organization is a question of who gets access to it. For example, some firms have installed electronic message systems only for managers, when secretaries and administrative personnel are critical to the success of many organizational processes.

Another example involved the most successful use of WP technology I have seen. It occurred in a research lab that provided access to text processing software to all professionals, as well as to secretaries. Access to a system is one of the design variables by which office system impacts can be influenced and controlled.

Delivering a system in an organizational setting is a question of the procedures in which a system is embedded. For example, the organization of secretarial support services will be instrumental in achieving benefits from WP technologies. Secretarial services may be centralized, decentralized or distributed; they may be specialized, unspecialized or mixed.

Another example of this influence are common procedures across departments for indexing and filing documents, which can be instrumental in the success of search and retrieval systems. The procedures in which a system is embedded constitute a second major design variable for influencing and controlling office system impacts.

The bad news is that designing appropriate procedures and access patterns is hard work. The good news is that it pays off in benefits from office systems. OA

Markus, a consultant in the San Francisco office of Arthur D. Little, is also a research associate at MIT's Center for Information Systems Research. She specializes in organizational issues that surround the use of advanced information technologies and is the author of Bugs and Features: An Organizational Perspective on Systems, *Pitman Publishing, Inc., 1983.*

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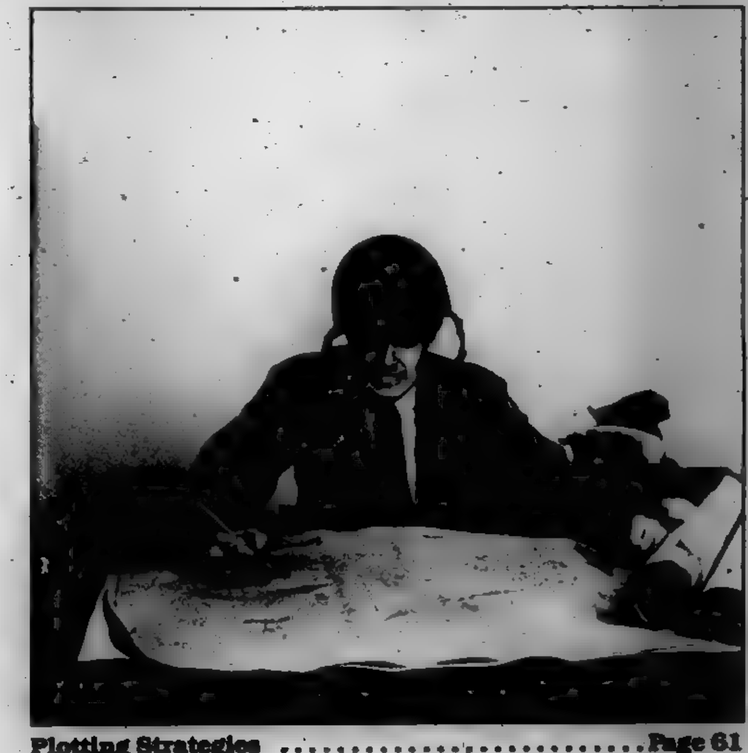
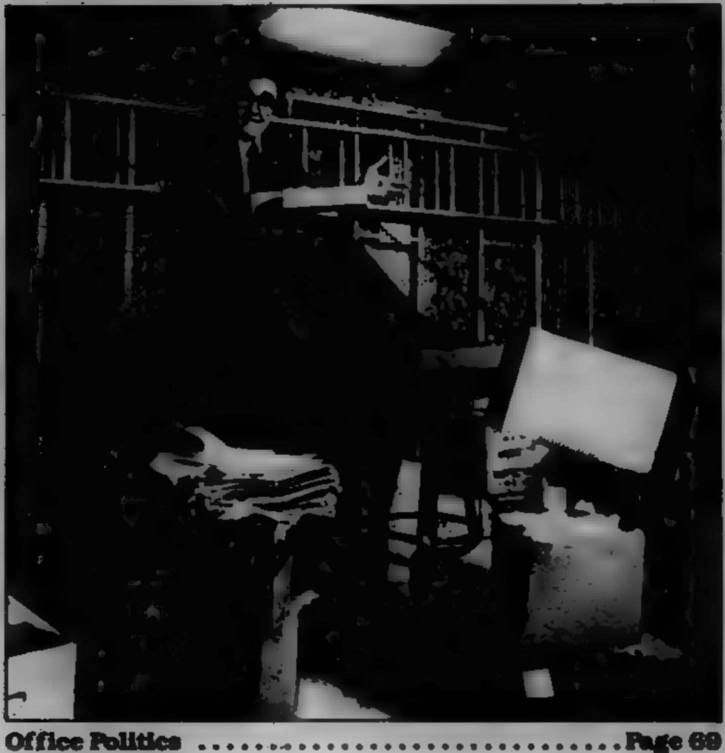
Planning or Pilots .... **Page 46**

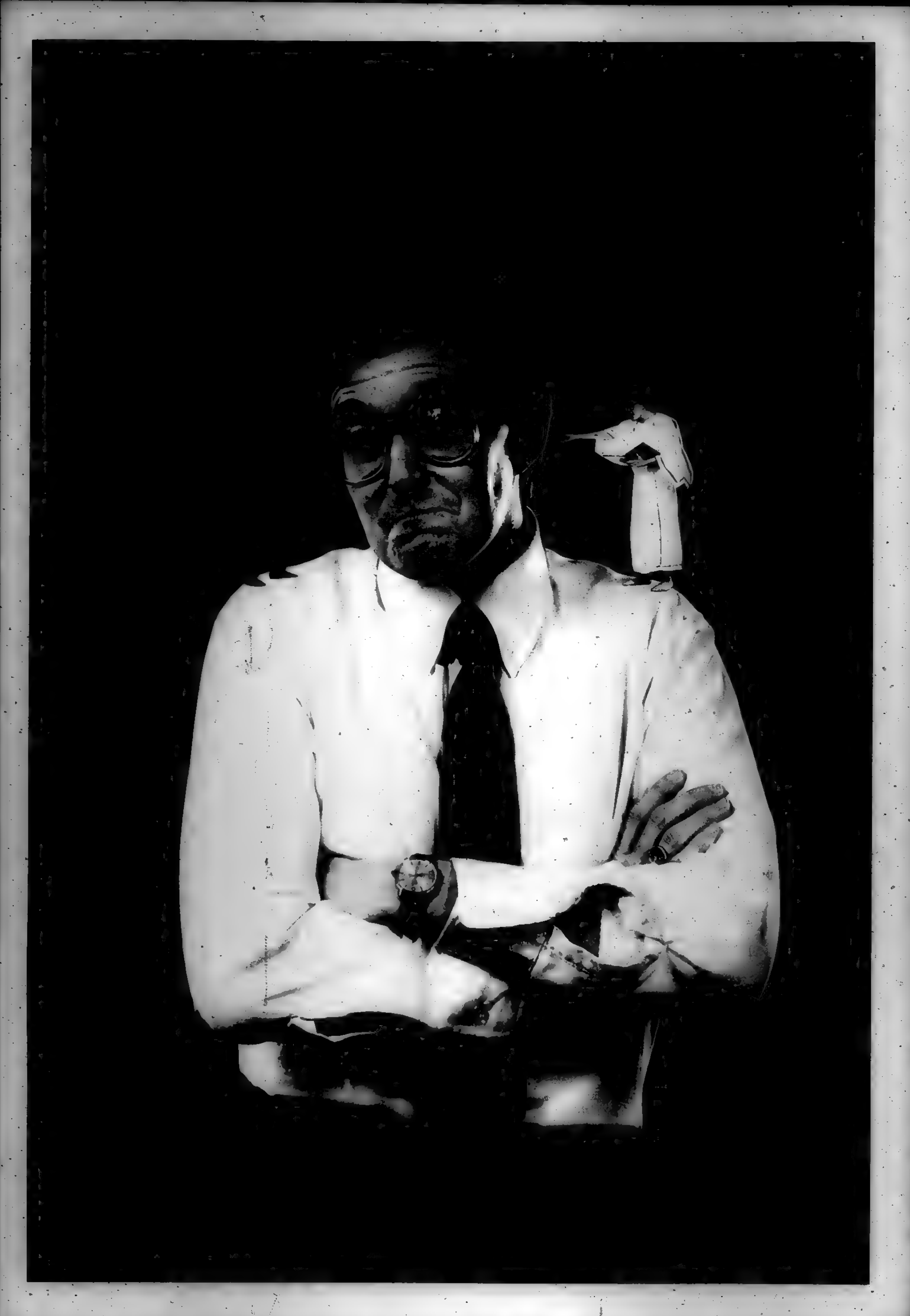
Surveying Users' Plans .... **Page 55**



Plotting Strategies .... **Page 61**



Office Politics .... **Page 69**



FOCUS

Plan! Don't Plan!

Two approaches are open in OA — strategic planning and pilot projects. Which one (or combination) to use depends on your need.

By J.T. Monk and Kenneth M. Landis

If the portfolio of systems, tools and technologies that comprise office automation is to be applied correctly, organizations should implement a strategic OA plan. The plan not only includes long-term hardware and software considerations, it also establishes the management foundation for the organization's information structure.

A major factor in the successful use of OA technology is a commitment from top management. Anyone who has the money can buy a computer system, but transforming raw processing power into a business asset requires top-level commitment. Moreover, this commitment must come in two forms: first, the acknowledgment that information is a valuable corporate resource that must be managed with the same intensity as a cash asset; second, a willingness to devote the financial and human resources necessary to

(Continued on Page 48)

By N. Dean Meyer

Many organizations begin their office automation programs with an organizationwide study and a strategic plan. Yet evidence suggests this is not the most effective way to get started.

Evidence comes from three sources: case studies of leading-edge user organizations, research on effective management strategies and the experience of prior innovations. All three converge on a more evolutionary approach.

Large organizationwide studies and strategic plans seem to be a poor starting point for a number of reasons. They require the expenditure of significant money and effort prior to showing any results. At the same time, they do little to build the credibility of OA professionals or to initiate momentum in the organization.

Furthermore, organizationwide studies may lead an OA staff group to focus on less-than-optimal areas.

(Continued on Page 50)

(Continued from Page 47)

integrate and adapt the technology to the organization's needs. The commitment to OA must begin with the chief executive officer and end with the individual users.

Many DP and line executives argue that OA technology is too complicated for a majority of their potential users; others believe the industry must mature before a capital investment is made in equipment that may be quickly outdated by new products. Neither concern should be a deterrent. The OA industry has matured to a point where investments in various functional technologies will yield a significant positive return and should be made.

Strategic planning provides the direction and identifies the decision criteria necessary to select and implement OA technologies. Strategic planning addresses the concerns of management and increases the awareness and comfort level of those involved in the automation process. It structures the OA decision. Alternatives are assessed on their respective merits, not on their technological sex appeal.

A discussion of some of the long-term issues follows.

Connectability: A long-standing problem in information systems is that different manufacturers use different interface methodologies to link their equipment. This situation is caused by the technical requirements of various systems and explicit market segmentation efforts by the vendors. The result has been high software and network maintenance costs.

The connectability problem is particularly severe in office automation; all operating units require a telecommunications capability. Communications functions are often embedded in the hardware/software configuration chosen or in the organization's existing DP/networking equipment. Incompatibility severely affects the overall value of the OA system by artificially limiting its uses within the organization.

Standardized Workstation: The only "standard" workstations produced by the industry are serial character-by-character transmission Ascii workstations. Many workstations are not able to support the full Ascii character set. The limitation imposed is that they may not be fully compatible with future generations of OA software. Furthermore, if the organization decides to install an OA system that is not compatible with its existing workstations, the write-off and new investment costs of acquiring compatible workstations may cause an otherwise sound decision to be blocked or deferred.

Varying network protocol standards also reduce software and hardware transportability. The native communications mode may be vendor-dependent, which limits the organization to that particular vendor's OA solutions. Those solutions may not be the best way to solve the company's problem.

Brute force compatibility can be achieved through the use of protocol translators, which enable diverse native technologies to communicate. Although these translators are viable products, they increase the cost and complexity of establishing and maintaining an OA network.

Single-Vendor Equipment: Contrary to some marketing literature, there is no single-vendor OA solution. The vendor that has everything for office automation simply does not exist.

Security: An automated office system must incorporate a level of information security the same as or greater than that used in the previous manual system.

Organizations should take advantage of the opportunity presented during the planning process to develop a security plan. A security plan designed and instituted after the planning and implementation process is complete will result in unnecessary expenditures. Without a cohesive security plan in place, the organization runs the risk of degrading its internal controls or compromising sensitive information.

The Human Interface: The introduction of technology within the office often creates more fundamental problems. For example, OA technology will change the flow of work and information within the office. These changes affect the informal, if not the formal, organizational structure, and these structural changes impact individual job characteristics. In addition, the way in which the work itself is accomplished is changed; personal and managerial styles are forced to synchronize with the technology. Management must be apprised of these potential impacts and be prepared to deal with them.

The introduction of OA will affect the components of the office's environmental design: lighting, air circulation, noise control measures and office fixtures. These environmental needs must be recognized and addressed.

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The dynamics of office life — interpersonal communication and the office's social hierarchy and order — are affected by technologies such as electronic mail, voice mail and telecommuting. The social order of the work place literally changes overnight, and an organization must be prepared to deal with these potential changes. One method is employee sensitivity training: Allow the employees to become familiar with the technology before it appears on their desks.

Top management must prepare a plan that outlines the steps required to implement the organizational information management goals. The plan must address the assimilation of existing technology into the office plan. Emerging technologies whose availability can be reasonably forecasted should also be included.

The last 15 years have taught us that the technology of information management changes constantly. To accommodate this evolution, a strategic plan can be critical. The plan provides a direction for orderly growth and minimizes the impact of information and technological change.

Three basic principles are clear: An organization's information resource must be accessible; the information processing devices must be interconnected; and, finally, the individual user's needs must be met.

Strategic planning for OA requires a systematic evaluation of the business, and the planning criteria include corporate goals, objectives and available resources. A successful planning process is accomplished by means of a phased approach. The result of an OA strategic planning effort should be an integrated model of the organization's information needs, the generic software/hardware configurations that fill those needs and an analysis of the corporate resources requires — such as personnel, capital and time.

After an organization has made the decision to commit to OA, five phases of action follow:

Phase 1 involves a detailed review and analysis of the business' internal and external environment, including current and evolving business strategies, goals and objectives, performance, problems, issues, strengths and weaknesses. The automated office must be assimilated by the business, not grafted onto it. Critical success factors are identified to provide a system of checks and balances as the business evolves. The plan helps direct the business' energies and defines its OA plans.

Phase 2 identifies the architectural requirements of the automated office, including hardware, software, telecommunications and functions. After reviewing the current state of the art, the planners can match their company's information needs to the available technology.

Phase 3 addresses the issues of organizational capacity and resources from both a human and a financial perspective. This multidisciplinary approach identifies the impact of technology in both qualitative and quantitative terms. Each component of the office system should have its financial and personnel impacts analyzed and these should be related to the appropriate business strategy and the total corporate structure.

Phase 4 defines and establishes direction and timing parameters for the detailed implementation plans. Consideration should be given to such factors as financial posture, managerial expertise and staff availability. Once activated, the implementation plan coordinates the introduction of the OA systems.

Phase 5 is the continuous process of managing the evolving environment. This phase demands a continuing effort on the part of the organization. As external and internal environments change, the planners must fine-tune the strategy whenever necessary. Should one or both of these environments change drastically, a major overhaul of the plan will be required and should be made.

Strategic planning provides the framework for the integration of office technologies to increase the efficiency and productivity of the work place. Effective planning must be accompanied by organizational commitment and involvement. Without this vital element, the technology is useless.

Office automation could become as important to an organization's future health and well-being as the success of its products. The strategic plan is the key to OA success. OA

Landis is a consultant in the St. Louis office management consulting department of Peat, Marwick and Mitchell & Co.

Monk is a manager in the St. Louis office of Peat Marwick. Prior to joining the firm, he worked in several departments of a large manufacturing corporation.

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(Continued from Page 47)

Because they are highly structured, large studies chart administrative applications well. This may identify opportunities for cost savings. However, large studies are of limited depth, and they tend to miss the higher payoff managerial and professional opportunities.

Organizationwide plans may in fact be dangerous. They encourage top-down design of large systems. This approach worked well for well-structured DP applications, but not for OA. Large top-down system design projects risk large expenditures of time and money before they show results. Because they must be relevant organizationwide, they address only the less critical administrative functions common to all users.

High-payoff applications are those that directly address the business mission of a user group and are unique to each user group. Furthermore, because the tools have great impact on the way people work, change must be carefully managed in each new application. To attain significant improvements in management productivity, an incremental evolutionary approach is required.

Organizational studies and plans do indeed have a role, but they are generally more effective a bit later in the process.

At the beginning of an OA program, the challenge is threefold: to build a capability to deliver OA applications; to initiate evolutionary momentum through pilot applications and to plan for technology integration and support.

The starting point is to identify responsibility for OA somewhere in the organization. Task forces can do studies, write plans and raise the issues, but they seldom follow through with implementation and ongoing support. Cursory studies of the total potential of OA in the organization may help get management attention and justify establishing an OA group. Management awareness presentations at a high level may also help. Research offers clear guidelines on chartering and staffing an OA group.

To further prepare the OA group to support users, they must be trained in the broad range of tools and technologies and in managing implementation projects. The most powerful way to train the OA staff is through the experience of a "builder pilot." The OA group should use the tools they offer to others.

The next challenge is a diffusion plan that analyzes how OA will spread through the organization. New ideas seem to diffuse through organizations in fairly consistent ways. Pilot locations can be selected by balancing business need, the influence of user opinion leaders, the user climate for change and the relevance of the technologies under consideration. At this stage, one is seeking just a few pilot opportunities with significant payoff in the right places in the organization.

Having covered these bases, the OA staff can then start to build credibility and momentum through implementing pilots for these opinion leaders. They need not start with any one technology (such as word processing or electronic mail); any starting point will evolve toward the same integrated systems in the future. Early pilots should select tools based on the business problem of concern to selected users.

Implementing pilots before a plan is written risks technical chaos. However, the top-down approach risks no progress.

Implementing pilots before a plan is written risks technical chaos. However, the top-down approach risks no progress, a fate far worse than future technology patches. Early pilots can be designed to ease later integration by focusing on established vendors' available technology that is flexible and can communicate in standard ways.

It is of utmost importance that these early pilots be very successful. Dramatic returns are possible, similar to those of the early days of DP. However, the issues of change are also particularly significant at this stage of growth. Success requires careful management of the people issues and the active and meaningful involvement of end users. End-user training and workshops are powerful ways to initiate involvement. A variety of project management methodologies are then available to structure user participation.

The results of early pilots should be documented to be able to advertise a success. This measurement should demonstrate

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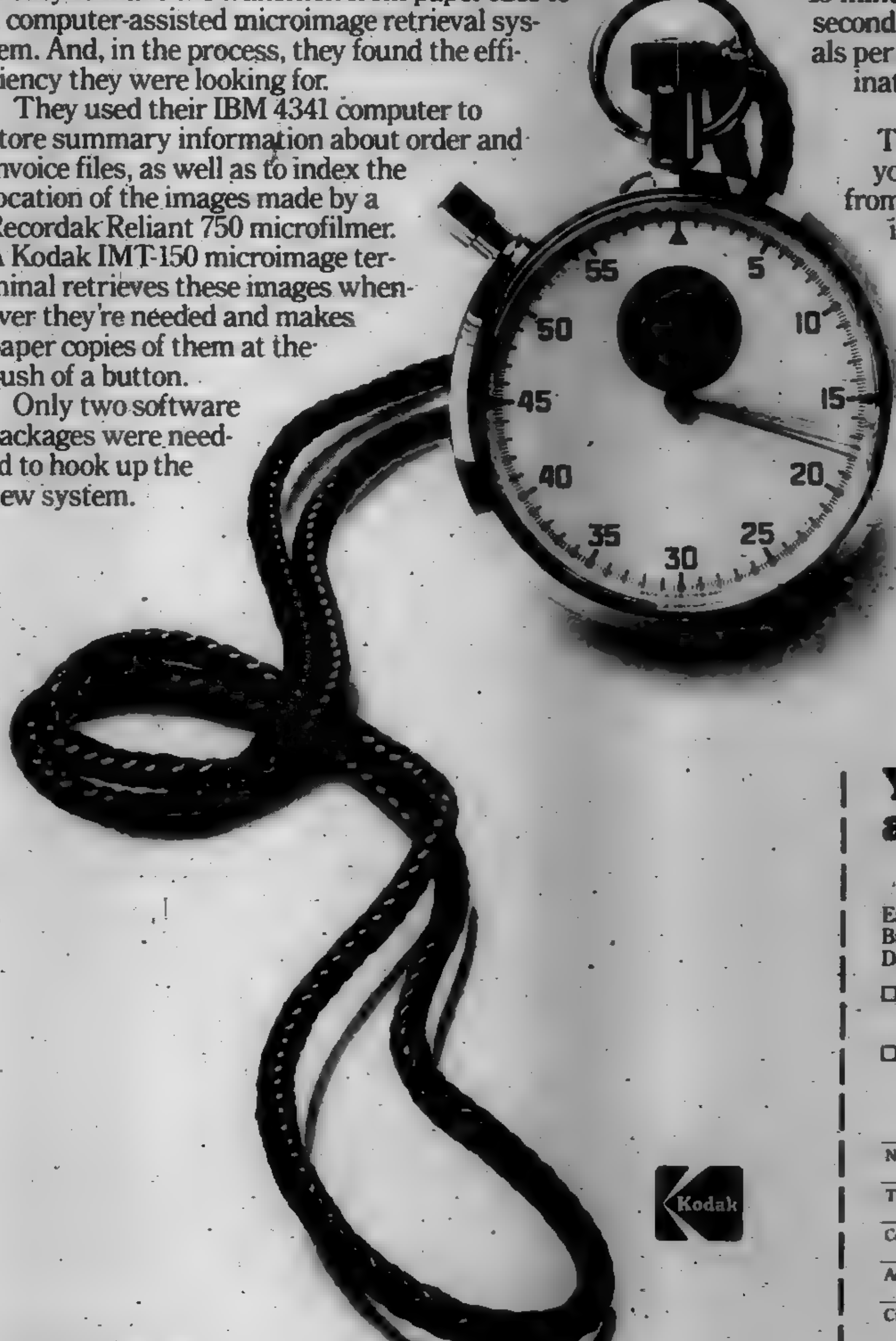

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CINCOM TOTAL	YES	YES	**NO**
QUERY WITH GRAPHICS	YES	YES	**NO**
APL	YES	**NO**	**NO**
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ANSI COBOL	YES	YES	**NO**
BASIC	YES	YES	YES
RPG	YES	YES	**NO**
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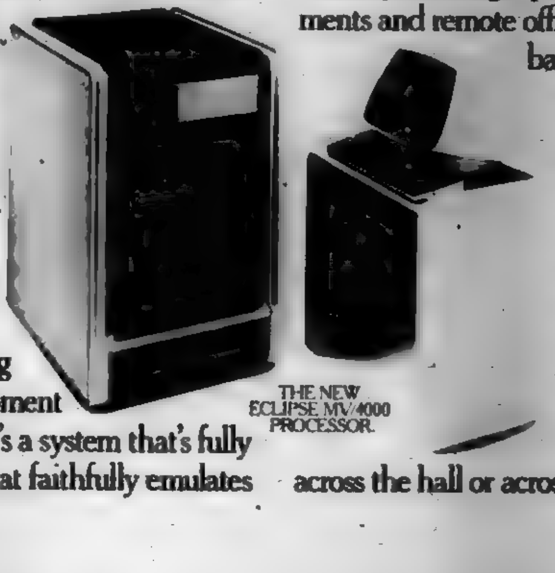

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more than administrative cost-efficiencies. To be relevant to business managers, benefits should be expressed in terms of the users' mission and objectives. There are a variety of ways to evaluate managerial and professional productivity and effectiveness, all related to the specific context of the application.

At some point, more organizational commitment is required — in the form of budget, staff and widespread involvement in a strategic planning exercise. A rough scoping of the total potential may at this point be based not only on analysis and others' experiences, but also on the early pilots. The OA team now has evidence of the benefits of a few applications in the context of their unique organization, and it also has powerful allies in the user community. These make a far more convincing argument for resources than might have been made only a few months earlier.

Strategic planning is a political event in itself. It builds widespread awareness of the potential of OA and of its cost. Thus, the strategic planning exercise should wait until the OA staff is ready to respond to the interest generated by this exposure and the questions it will raise.

An OA plan is more than a technology forecast. It must also consider future business needs, the broader business environment, the pace of organizational change, staff support requirements and investment strategies. OA planning should not be done by staff groups alone.

The planning exercise may be used to involve a cross-section of senior managers in thinking through the potential of OA for their business. Users can be guided through a process of describing future functionality based on business needs and directions. This should result in the identification of needs and applications of far greater relevance than "expert" systems analysis.

After the functionality of future systems is described, technical staff can design the infrastructure that, by its nature, must be built top-down. Staff can also develop and refine policies and guidelines for pilots, personal computers, word processors and so on. These guidelines should leave room for local tailoring and user involvement, while ensuring long-term technical integration.

The technical design of the infrastructure and guidelines for pilots can be based on an analysis of the range of tools in the integrated office of the future and what tools and information fit best at what level in an organizational network. This future network will accommodate personal computers, group computers (such as word processors), establishment computers (such as the private-branch exchange), organizational computers (for example, management information services) and public time-sharing. Each has unique attributes and has a unique role in supporting the range of OA tools.

Planning is an ongoing process. A plan is not a fixed document, but rather a moving target. It should be updated on an ongoing basis to reflect changes in business directions and needs as well as technology developments. After the first plan is written, a regular planning process can be installed. At this point, user councils and end-user training programs may be formalized to ensure continuing involvement.

> ***"A strategy of pilots before plans risks minimal investment of effort and money up front and delivers business benefits early in the process."***

A strategy of pilots before plans has numerous advantages. It risks minimal investments of effort and money up front, while delivering business benefits early in the process. It retains a business-need orientation and focuses attention on managing the process of change. It builds a healthy relationship between users and OA staff. And it provides for technology integration without locking the organization into large monolithic systems development efforts.

This evolutionary strategy is quite different from the standard approach to information systems planning. Many successful OA managers have found this evolutionary approach more pragmatic, even if a bit less logical. **OA**

Meyer, an OA consultant specializing in managerial and professional systems and applications, also hosts discussion groups by teleconference. He works from his "electronic cottage" in Ridgefield, Conn.

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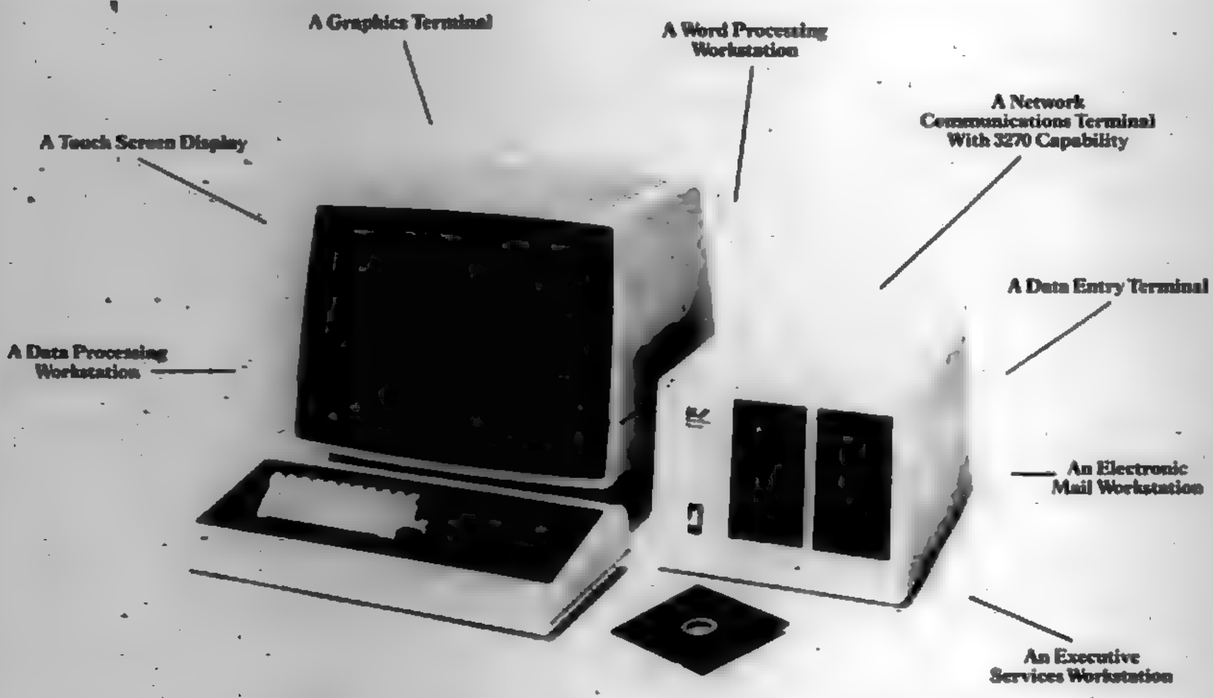
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Survey The Field

How are OA implementors executing their strategic plans and what do they include? A survey reveals how other planners are coping.

By John M. McQuillan

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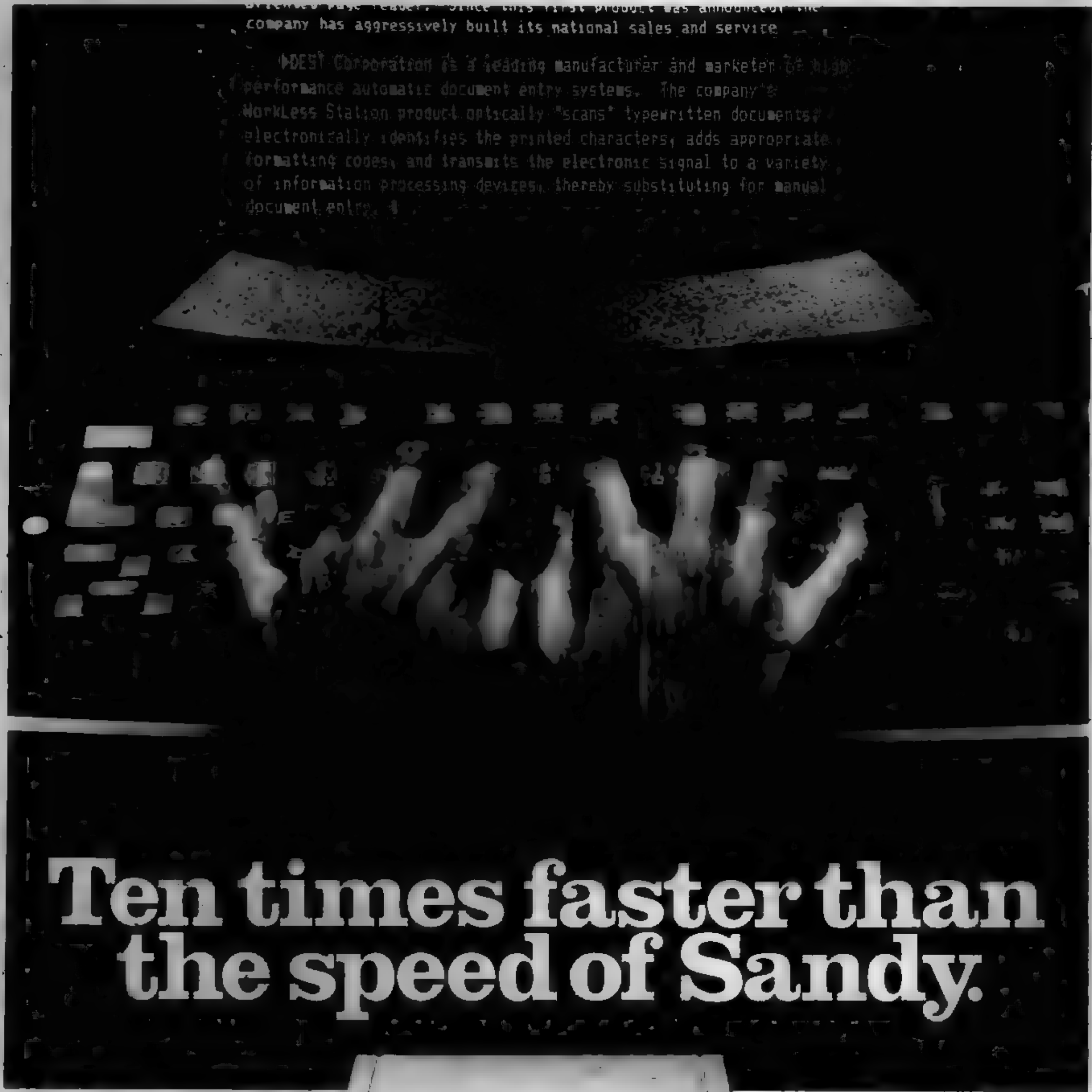
Many organizations are developing a formal strategic planning process for office automation. They are spurred by the belief that this planning function should be analogous to the strategic business planning activity and to long-range planning for computing and communications. In fact, in several forward-looking organizations, computing, communications and OA all report to a single information services manager who has ultimate responsibility for planning in each area and for integrating the plans.

Much has been written about the need for planning and integration and about the right planning methodology, but very few organizations seem to have an OA plan today. In a recent survey, 37 organizations had an OA strategic plan, architecture or specification, but many more organizations did not yet have their plan finished or even started. The following reports on some of the findings.

What did the plans in the survey look like? Variation occurred both in the planning process and in the resulting outcome. However, a pattern did emerge. Four types of OA plans appeared:

- **Strategic Plans.** These are also called long-range plans, five-year plans, statements of direction or blueprints. They are primarily concerned with establishing the scope and purpose of OA within the organization — what it is, what it is not and why.
- **Specifications.** These may be called checklists, functional requirements, requests for information and so on. Some are very broad, covering many technologies; others are limited to one or more key areas. These plans are statements of the organization's technical requirements.
- **Requests for proposal (RFP).** Normally, RFPs are not considered to be plans in the conventional sense of the word. For many organizations, however, the RFP is the only formal statement of the direction or technical requirements, so it is the plan!
- **Cost-justifications.** These internal documents, such as funding requests and capital approval requests, are required by most organizations when a major sum of money is to be expended in a new area. Like RFPs, cost-justifications are not conventionally classified as plans. Again, in practice these reports have often included the only formal statement of why an OA pilot is being proposed, who will be involved and how it is anticipated that the benefits will outweigh the costs.

Many OA plans begin with an assessment of the present organizational and technical setting into which new technology will be introduced. This assessment then leads to considerations of why the new technology will represent an improvement — an area in which most plans are weak and fall back on generalizations of white-



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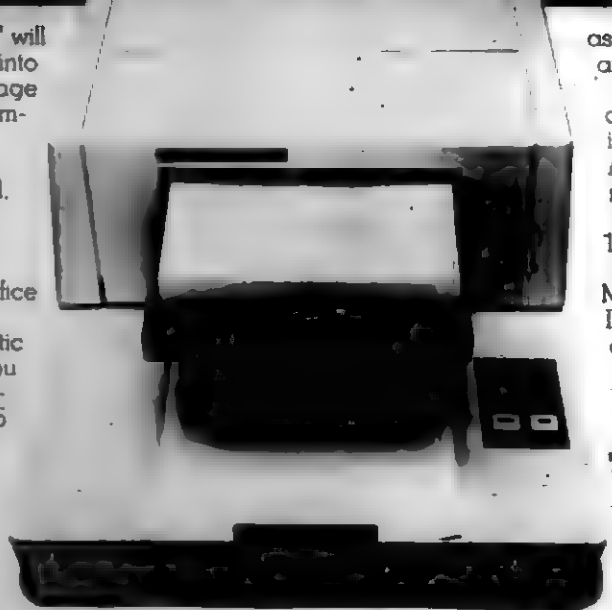

collar workers. Not all plans are weak in this area, however. A major government regulatory agency put together a very convincing argument for office automation based on the clear historical trend toward an ever-increasing work load at the agency, both in absolute terms and per staff member. This driving force, they pointed out, is compounded by new pressures to cut costs and to reduce the head count in the agency. Finally, the plan showed how OA could be viewed as an extension of the established strategy of increasing computerization of all agency functions. In short, this organization demonstrated that it is asked to do more each year with fewer people, and the only way to meet its stated mission is to automate.

Another important common feature of well-written plans is that they contain a succinct statement of direction. This may take the form of a call to action if the direction is currently lacking, or it may simply be a restatement of the consensus view formed over the past few years of experience. For example, the major recommendation made by a major industrial research and development facility was that office computing should evolve away from present mainframe solutions toward personal computers on a local network. One benefit of such a clear statement of strategy is that it makes it possible to identify counterstrategic developments and to try to slow or stop them.

Sometimes the statement of direction must be broadened to include different themes for different sectors of the organization or for different levels in the hierarchy. For example, the R&D facility distinguished between management functions (such as electronic mail, calendar, tickler and administrative computing) and scientific and engineering functions (keyboarding, editing and technical computing).

Finally, many of the plans reviewed in the survey were in agreement on the reasons for planning in the first place. They cited three major motivations:

- The pace of technological change and the growing number of vendor offerings, which put a premium on a coherent approach to office technology.
- The need to avoid proliferation and incompatibility.
- The need to get the full potential benefit from the OA investment.

It is clear that these organizations view their plans as the necessary first step in establishing the framework for subsequent management controls.

Nevertheless, even the most thoughtful plans were incomplete in one way or another. This is not surprising, considering how new office automation is and how difficult it is to plan well for an activity without several years of operating experience.

This, of course, is one of the basic paradoxes of planning. What are the problem areas in which we need more experience in order to plan better? Some of the more important technical areas that emerged from our survey included:

- Integrating the electronic office with the paper office.
- Integrating voice and image processing.
- Ensuring security and privacy.
- Converting software and operations from mainframes to personal computers and how soon that conversion should be accomplished.
- Choosing between local-area networks or private branch exchanges for local data transmission and deciding how soon to convert.

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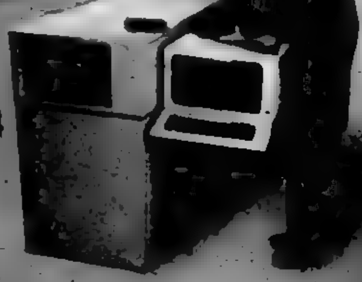

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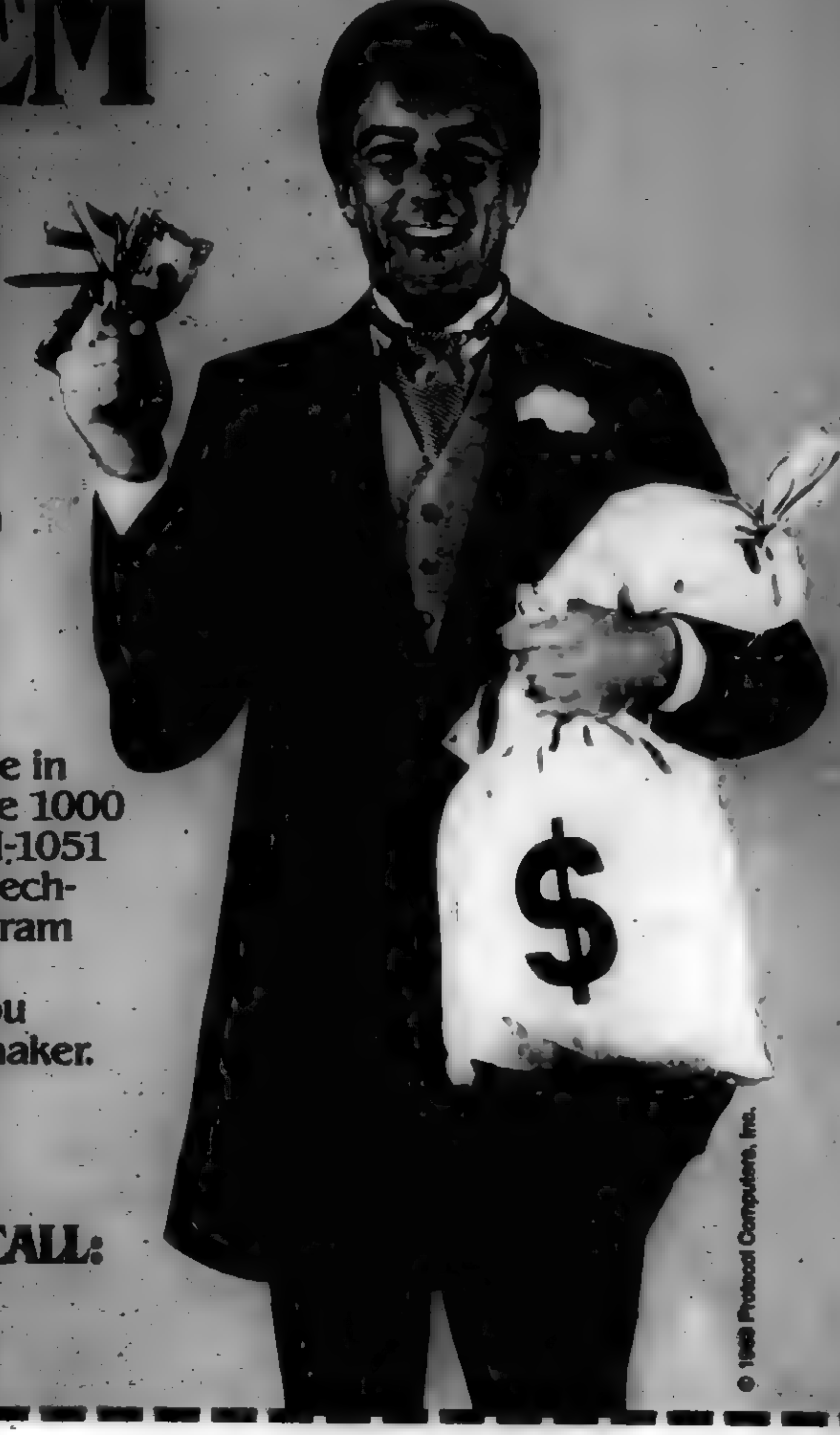

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Some of the most difficult questions of all are actually management issues:

☐ How can OA be cost-justified?.

☐ How does an organization choose between specialization and standardization?.

☐ What should the right accounting, chargeback and investment policies be?

☐ How can a a flexible growth policy be established to avoid the worst aspects of proliferation, but employ new advances?

☐ How can success be measured in a pilot or in full operation?

☐ Who should be in charge of OA, or planning for it or implementing it?

Of course, many other very important problems seem to be common to most organizations, but this short list provides a glimpse at the size and number of difficult basic questions raised in the planning process.

Step-by-Step Guide to OA Planning

The survey convinced us that, although each organization must make its own plan, plans share many common features. The following is a simple planning framework or outline that almost everyone can adopt:

1. Strategic Planning
  1.1 Executive Summary
  1.2 Assessment of the Environment
  1.3 Driving Forces
  1.4 Statement of Direction
  1.5 Strategies and Policies
  1.6 Recommended Approach

2. Architecture Specification
  2.1 Executive Summary
  2.2 Requirements Analysis
  2.3 Situation Assessment
  2.4 Architectural Design

3. Systems Acquisition
  3.1 Executive Summary
  3.2 Selection Criteria
  3.3 Functional Specification
  3.4 Technical Specification
  3.5 Evaluation Methodology
  3.6 Cost Justification

4. Pilot Implementation
  4.1 Executive Summary
  4.2 Selection Methodology
  4.3 Pre-Pilot Analysis
  4.4 Management of the Pilot
  4.5 Post-Pilot Analysis

In our survey, the most frequently cited reasons why people had not yet formulated their office automation plan included some rather familiar refrains:

- "I don't have time for all my day-to-day responsibilities and the crises that come up, so how can I find time for planning?"
- "Planning is too complicated — I'm not a planning expert and I don't want to be one."
- "We can't do an accurate forecast for the next six months, and you want me to do a five-year plan? What's the point?"
- "We're doing just fine without a plan."
- "We don't need long-range plans, we need short-term profits!"

There may be some truth to these statements, but much more is probably going on here beneath the surface. Much of the resistance stems from underlying factors. For example, in one large financial organization, planning forced people to look into the future, which they found threatening and confusing because of all the changes in the industry.

Invariably, a new plan changes information flows, decision making, power structures and so on, and it highlights conflict within the organization. And, finally, many managers got where they are today by being good at producing short-term results, not necessarily by doing conceptual thinking about long term issues. They are often unfamiliar with the whole process of strategic planning and with its benefits.

Our survey respondents cited some very interesting payoffs from their planning work. A clear majority said the single most important factor for OA success is not the best technology, the lowest cost or the fastest return, but rather planning, direction and management control. Planners at a major insurance company told us they felt it was much more important to select the right group of people for their electronic mail pilot than to select the right electronic mail product.

To put it another way, almost any plan is better than no plan at all. Several other sayings come to mind: "Plans are nothing, planning is everything." As the senior executive of a Fortune 500 corporation put it, "Planning is the cure for presidential insomnia!" There is no question that it is cheaper to plan than to implement and that more alternatives can be considered — and in a broader "system" context.

There are also personal advantages for the individuals involved in the planning process, who are often staff members in the management information services or DP departments. They report that it is an excellent natural channel for the involved parties to communicate about objectives, strategies, technical alternatives and expectations. These planners found it to be an invaluable learning experience, which gave them exposure to a broad set of issues and brought them into contact with many members of the top management team.

Several hard-dollar savings were cited as a result of putting the plans into practice. One diversified industrial organization achieved significant savings from quantity discounts on volume purchases of products. Without the plan, the volume would have been due to proliferation of different devices.

An insurance company cited another major benefit: Training costs, which can be quite substantial, were lowered because of fewer device types on which to train people, better in-house expertise on those systems and less need for cross-training or retraining when people were transferred. Finally, substantial savings resulted from reducing or eliminating the use of conversion devices and services and outright rekeyboarding and manual conversions.

Although very few organizations now have formal plans for the automation of their offices, a marked trend does exist in this direction. As users gain experience with the many different aspects of office technology and how it affects organizations, they will be much better able to plan for the future.

The pioneering firms surveyed here help show the way. **OA**

McQuillan, a consultant based in Cambridge, Mass., assists vendors and users of OA and communications systems. Formerly president of BBN Information Management Corp., he was also involved in the development of the Arpanet packet-switching network.

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Develop New Strategies

Things are changing for the MIS manager — sometimes too fast for comfort. Where do you start and how do you keep pace?

By Richard Dalton

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The concept of widespread office information systems is at least 10 years old. It hasn't been an easy decade for MIS honchos. Distributed processing (especially if it could be limited to remote job entry) was OK, but then the dam broke: Personal computers, applications generators, teleconferencing and missionary projects like "Information Centers" helped compound the difficulty of running the data processing factory.

The aggressive information systems head may have already realized the truth about this era of change — we are near the bottom, not the top of the learning curve. Less ambitious types may agree with a DP vice-president who recently described his future role as limited to "maintaining a clean data base."

The newest challenges come in areas largely divorced from traditional systems technology. While juggling the ongoing mainframe work load, MIS departments are also being asked to respond to a

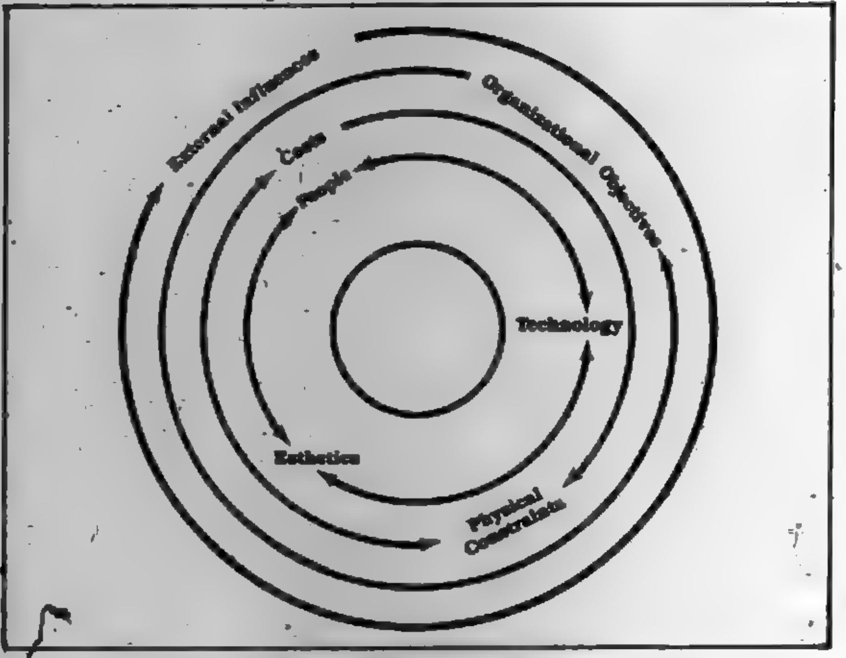

Figure 1. Planning Factors

plethora of requirements that focus on the emerging electronic office. These include:

- *Advanced Communications Facilities.* Everything from satellites and cellular radio to cable television. Even worse, it's not just neatly codified data that is being pushed down the line. Voice store-and-forward, text from incompatible word processors and even video signals complicate things.
- *People.* Instead of a remote "here's-the-report-you-requested" environment, a flood of personal computers and terminals is providing office workers with tools they often marginally understand but that have the capacity to obtain information directly from large-scale systems. Training, counseling and controlling an ever-increasing population of personal-computer-equipped users is now critical.
- *Facilities.* These are a totally new concern. Where do you put all those local network cables? How do you respond to questions about optimal ambient lighting for CRTs or ways to suppress static electricity in the office or to control equipment noise and vibration levels?

In truth, these new, interrelated concerns are probably more than one person, department or set of skills can deal with effectively. If the issue is the organization's success (and it ought to be, as opposed to empire building), a comprehensive effort involving key decision makers from MIS, administration (now sometimes called facilities management) and telecommunications is a prerequisite.

Organizationwide systems planning has always been needed. The added considerations related to office-based information systems make this planning imperative.

Whether it's comfortable or not, the office systems phenomenon represents a permanent change. Video games may be a fad, but office systems hold too much promise to be regarded lightly. Even more important, they will not be static, one-time considerations — any more than an IBM 360 was the last computer anyone would need. The net result is an ongoing process that will continue to evolve as better computer and communications capabilities present themselves.

Avant garde office workers who bought their own Apple IIs from Apple Computer, Inc. a couple of years ago are now lobbying for IBM Personal Computers and Fortune Systems Corp. micros. Complex software, electronic mail and on-line information services are being championed. As communications improve and portable systems mature, we will begin to see people abandoning their offices and commuting habits (at least part-time) for Alvin Toffler's "electronic cottage." Early work-at-home trials look promising for many knowledge workers.

What is this going to do to the brand new 40-story tower the company just completed? How do you arrange space to accommodate people who need an office only two or three days a week? How much telecommunications capacity will you need to service the stay-at-homes?

Since those are only a small percentage of the questions that must be dealt with, systems planning can be viewed as an ugly, if not impossible task — certainly one that you could comfortably put off until current, more familiar problems clear up. You do so at your organization's risk.

It is always easier to work from known information into the unknowns. An amazing number of large MIS departments have a very muddy view of the applications that are operational, in development and in the queue. Ditto for current and planned capacities, especially if you include the variety of small "pirate" systems already in place.

But the initial survey of where you are now cannot end with information systems if you are to create a plan that can deal with the future expansion of electronics throughout the organization. You need to look at the whole organization: what it does, how it communicates, how it relates to the outside world, what its objectives are and where expenses are allocated and profits generated.

That is certainly a major task, but an unavoidable one if you want to do more than guess at future impacts and fumble ahead hopefully.

You must also include an assessment of available technology and likely future directions. That, however, is a job that a lot of people want to do. It is the initial task, creating a model of the organization against which to test the future, that usually lacks volunteers.

Some unusual considerations have been brought up as well, such as the effects on the office facility itself and the people housed there, as we proceed with a deployment of technology. These issues need specialized skills that are generally not available internally, even in large organizations, and must be acquired from outside consulting groups. Professionals with experience in space planning and design, industrial hygiene and even behavioral science can contribute to an expanded planning process.

Planning office space has always been a challenge. You have to deal with compromises involving budgets, achieving the "right" appearance and helping people work together effectively. Very often, time is an overriding constraint as well.

The electronic office we hear so much about adds many new considerations, and the most important of these is the need to anticipate change — not as a set of predictable factors (like planning on a 10% increase in staff), but allowing for change itself. The problem is, we don't really know what will happen to office workers and their organizations if we install a personal computer on each desk, create an extensive videoconferencing network and/or make voice mail available throughout a building.

There are a number of theories about what you can expect from each of these changes, but they have not actually happened enough for you to extrapolate how they will impact your own organization. The best thing planners can do at this point is develop an approach that can adapt to a relatively unpredictable future.

Figure 1 shows the factors that need to be juggled. The importance of each one can only be evaluated in the context of an individual organization's needs (which tend to change over time).

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- T1 0M to 10M
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- T3 20M to 50M
- T4 Over 50M

hence the requirement for a broad, ongoing planning process that recognizes the realities of shifting priorities. That's a major commitment of time and resources and needs support from the highest levels in any organization.

The lack of systems planning has always been a hindrance to developing information resources that provide the best support for an organization. In the past, however, most MIS departments have done a reasonable job of meeting most urgent and longer term needs. But past performance isn't good enough. That performance was related to highly centralized, batch-oriented systems. Office systems are wildly decentralized and unforgivingly real-time. They are also changing on a schedule that can cause vertigo in a 20-year DP veteran.

> ***"Poorly considered systems can have highly leveraged (organizationwide) results much more severe than early DP errors."***

There is too much risk to allow office systems to evolve organically. For all the recent price reductions, we are still looking at capital expenditures for office systems measured in tens of millions of dollars for large organizations. More important is the potential impact on other costs (office space, for example, now runs $3,000 to $12,000 per year per employee in metropolitan areas) and the effectiveness of the most critical element, the office worker, which can be improved or ground down depending on the support system decisions that are made.

This comes down to an authentic bet-your-business environment. Well thought-out office information systems can give organizations major competitive advantages. Poorly considered systems can have highly leveraged (organizationwide) results much more severe than early DP errors like the legendary incorrect billing problem. Unplanned systems leave the outcome to chance and responsible MIS executives should not feel comfortable with that avenue.

While technology is the driving force, an effective information systems plan needs to emphasize people, physical facilities and organizational structures. Miles of computer industry newsprint is consumed by arguments for and against 8-, 16- or 32-bit microcomputers and these concerns have little relevance unless your planning is based on people and the organization.

The skills needed for this new kind of broad-scale, integrated planning implies the creation of a multidisciplinary team of experts and a consummate administrator to keep the group of specialists on track.

The importance of this planning approach is becoming evident as early "office automation" projects provide questionable returns. The real value will be more evident as we see the less obvious, "downstream" effects of office information systems: for example, how the "less-paper" (not paperless) office will affect expensive space allocated to files and libraries; the impact of electronic transactions in banking and purchasing on office staffs; and wholesale redeployment of support personnel as their functions are assumed by electronic systems.

New communications technologies can even reduce the amount of time managers spend in meetings — and, one hopes, the office space reserved for conference rooms. And as all these changes take place, much more time will be devoted to training, employee evaluation and the matching of talents to new job requirements. Even our traditional hierarchical management style appears due for a change to a more open, networked approach suited to the advantages offered by these systems.

It is probably optimistic to describe the 1980s as an era of great challenge and opportunity for MIS people — more often the result will seem to be hard work with little assurance that the chosen direction will work for the best. The opportunity is real, nonetheless, and will be seized by those who can keep one eye on present realities and the other on a very shifty future. **OA**

Dalton is president of Keep/Track Corp., a Corte Madera, Calif., consulting and research firm that specializes in office-based information systems.

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Don't Forget Politics

Not just a necessary evil, politics can win friends and influence people, particularly when you introduce change in an organization.

By Kate Barnes

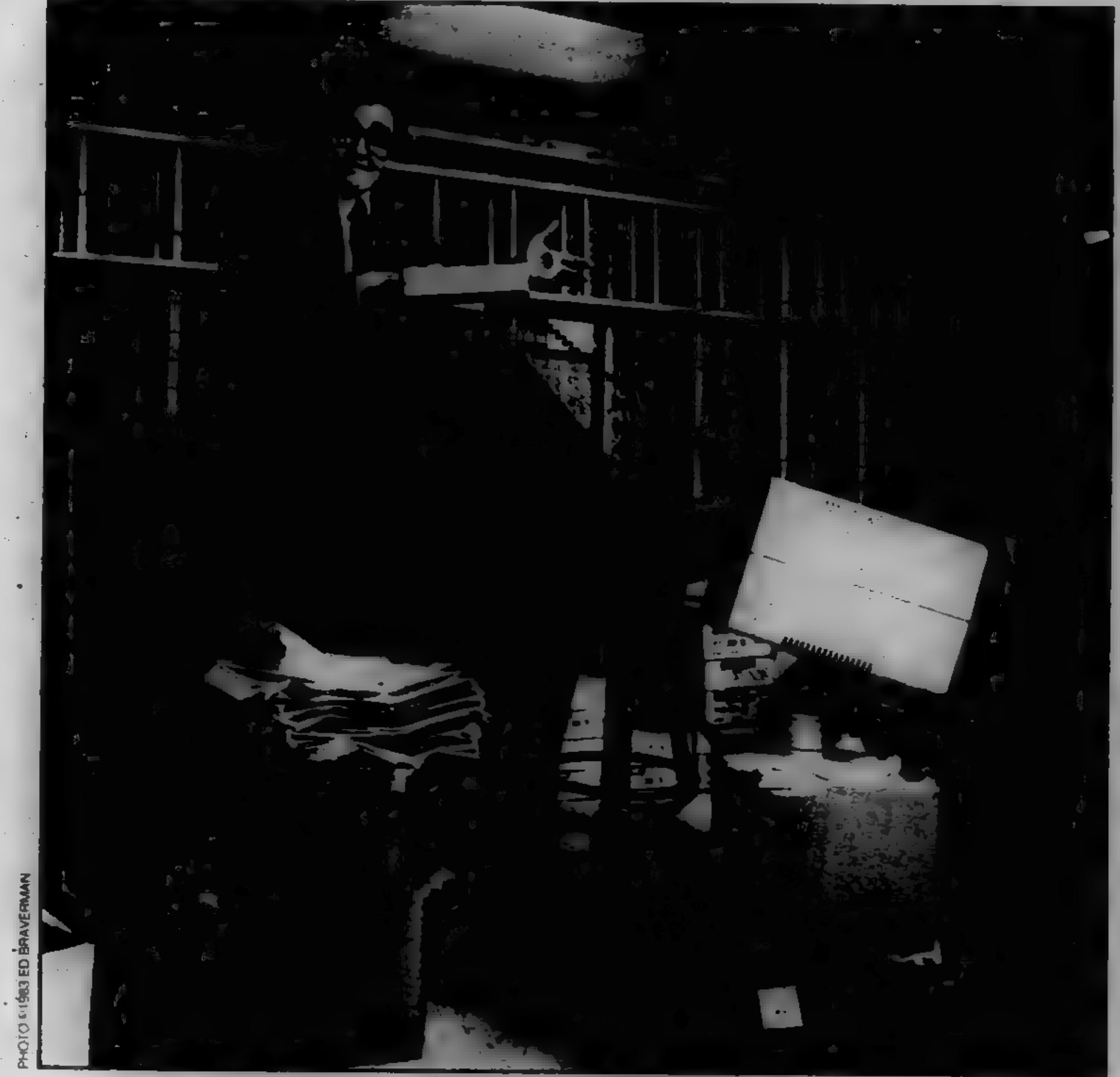

PHOTO © 1983 ED BRAVERMAN

Imagine this setting: Managers from the SMI Co. are considering two office automation proposals. Proposal A is justified by hard figures. Proposal B is sketchily justified. Proposal A will not be approved; instead, Proposal B will be given the go-ahead. Why? Insanity? No, politics.

Proposal A was for a teleconferencing system designed to reduce travel. Top management, however, didn't want their travel reduced, so the concept was scrapped. Proposal B, sponsored by an influential middle manager, was for a marketing support system that had the overwhelming support of the approval group. It passed because the right people were convinced it should. The technology is here. Why, then, isn't it fully exploited? If you say something like, "John, over in administration . . .," you're talking politics. Politics is the process of building coalitions and using influence when existing procedures don't resolve differences.

Politics often carries a negative connotation. Yet, it is a reality and is present any time two or more people work together. An OA system aimed at building a data base is a political act if it results in the redistribution of data. Such redistribution can affect evaluation, authority, autonomy and communication. It isn't surprising when people react politically to an OA staff member's job of building a data base, for instance.

Politics is not played by managers alone. Anyone whose status quo is about to be disrupted by OA may become political. Office automation affects jobs, territory, authority and influence — all political commodities. The greater the change, the less the acceptance and the higher the interplay of coalitions and informal influences.

The typical pitfall of many OA projects is that overwhelming attention is given to quantifiable matters (technology, data and the like), but little attention is paid to the people and procedures integrating with the technology. When people are ignored, political surprises occur and the OA staff can find themselves naively trapped.

To avoid this political pitfall, the OA staff must assess resistances, commitments and key players.

Assessing resistances: A collaborative relationship with the user is desirable. An involved user rarely criticizes the system he helped build. However, you cannot always create a collaborative relationship on short notice. Then, resistances crop up and politics come into play. One trick in using resistance to your benefit is to anticipate it and turn it into support. For example:

Gerry Hunter, a user manager, opposed office automation. She believed her authority span would be redefined, privileged information would be distributed en masse and she would have to learn to type. To Gerry, these fears translated into lessened authority. Opposition to OA was the easiest route.

The wise OA manager working with Gerry recognized her resistance and pointed out that her political strength would grow through access to more information, that a new authority span would mean new visibility in the company and that learning to use a keyboard would not necessarily mean learning to type 90 words a minute. Finally, the OA manager convinced Gerry that her reputation would be enhanced by the completion of more and better work.

People resist OA for many different reasons:

- Vested interests: "We've built up a good work group and see no reason why we should be asked to change our operations."
- Cultural rigidities: "We do things our way and don't like being told we should change them to suit the ideas of people who have no understanding of our jobs."
- Disagreements about goals and values: "Our priority should be customer service, not cost-cutting."
- Win/lose psychology: "This is a ploy by marketing to get first cut at funds for expansion."
- Territorial threats: "We have always been responsible for coordinating budgets."
- Fear of obsolescence: "What happens to our supervisor's authority when the system takes over?"
- The rumor mill of uncertainty about what will happen: "When they bring consultants in, they're looking to lay people off."
- Rivalries: "We have a lot of trouble getting cooperation from the production department and this system will allow them to . . ."
- Departmental focus on corporate issues: "The job of banking is to manage funds, not to play around with naive ideas of marketing."
- Private attributions of others' motives: "This has to be a back-door approach to getting control by the corporate staff."
- Group cohesiveness leading to general resistance to outsiders: "Those people at corporate . . ."
- Concern for job security and equity: "Why me? How come we have to do this here?"
- Absence of a felt need for the system: "We're doing a good job as it is."

Although many are hard to resolve, all these statements are rational. Resistances may be overt ("I won't have it here!") or covert ("Oh, I didn't understand."). Noncooperation and other covert responses are seen in groups that have little political power and few formal resources to employ.

Simply ignoring or suppressing resistance is rarely effective. Symptoms may disappear, only to resurface later. Another poor response is to focus on primary users (who use the system directly) while ignoring secondary users (who use the system through a "middleman" or provide input data without receiving benefits). Resistance from secondary users can be just as problematic as primary user resistance.

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The effective response to resistance is to view it as a warning signal from users. They may feel the status quo doesn't need to be changed; they may see more to lose than to gain. The ingredients for resolving resistances are authority, communication and negotiation. It also helps when outsiders (the OA staff vis-a-vis the users) can become insiders, creating a climate of trust.

Assessing commitments is also important. Is top management prepared to provide the necessary resources for the project? Is the user group committed? The following list of questions can aid in assessing the commitment of a user group: the more "yes" responses, the higher the commitment.

- Character: Does the organization have a "can-do," innovative personality? Has the group been a quick study in the past? Has its management shown initiative and problem-solving capability in the past?
- Exposure: Does the group have credibility within the company? Will success be visible and recognized? Can its success be used politically?
- Alliances: Does the department have close alliances with other organizations that will be interested in adopting the new approaches after they have been proven?
- Timing: Is the timing right for the department to take on a new, unfamiliar activity.
- Desire: Does the user group want the application? Are the internal politics of the organization favorable toward OA?
- Chances of success: Do they have applications that will prove the technology within a reasonable time? (Quick payoff applications reduce the likelihood of political criticism).
- Measurement: Can the benefits be quantified or otherwise objectively evaluated? Can logical/rational benefits hold negative political concerns at bay?
- Learning: Does the application provide a good learning experience in terms of behavioral, organizational and/or technical issues? Can that learning be transferred to other applications in the organization, reducing negative political actions?

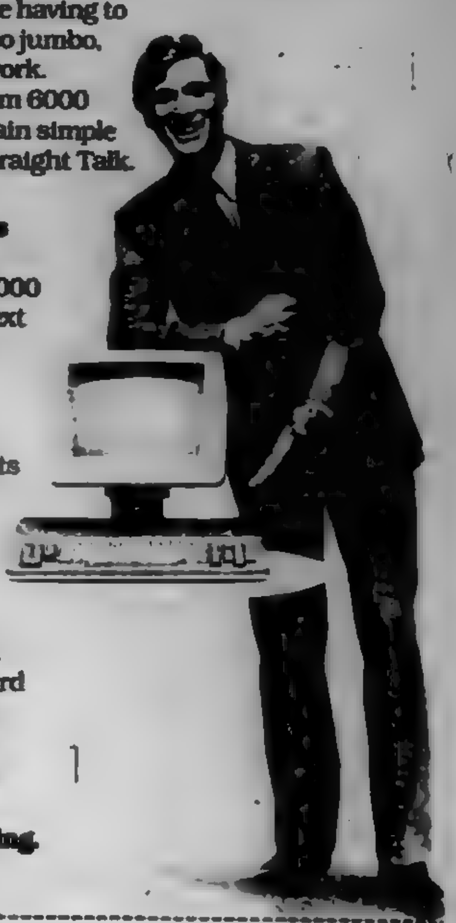
Assessing key players: It is also important to assess the key people necessary for project success. Typically, a few people determine the outcome of the effort. Identify the innovators, early adopters, later adopters, gatekeepers and intermediaries.

- Innovators are independent, ignore norms and push ahead with OA systems. When dramatic change or new technology is involved, innovators are needed. They cooperate with early pilot projects, but may lack the political clout to convince others of the value of an application.
- Early adopters have high political status and credibility. They listen to the innovators, can demonstrate the value of the new tools and can be a missionaries to the organization. They give credibility and visibility to the innovation. Often, early adopters are need-oriented.
- Later adopters are interested in the innovation only when its value is clear. If an innovator or an early adopter is needed in a project and only later adopters are available, keep looking.
- Gatekeepers provide a link between the suppliers of the technology and the potential users. They are good communicators and develop informal channels. Gatekeepers can discover needs and link innovators and early adopters. This role is often performed by the OA group.

1. **Define the issues.**
2. **Identify the actors.**
3. **Estimate issue position, power and salience for each actor.**
4. **Calculate weights for each actor and for whole system.**
5. **Calculate probabilities.**
6. **Determine strategies.**

Figure 1 — The Prince Political Accounting System

- Intermediaries can bridge the gap between headquarters and decentralized divisions. Mediation by intermediaries is important in controlling political moves. Intermediaries might work in the functional area, with technicians reporting to them. Such intermediaries need not be technical experts, but, rather, "smart buyers."



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Finally, in assessing key players, don't overlook the benefits of involving a variety of experts (like people from administration or personnel). More than a few OA projects have hit rough political waters simply because someone was forgotten. Even if a group doesn't want to participate, the offer alone might fend off negative political impacts.

Don't ignore politics. Consider up front:

- What is the development's political impact?
- What are the commitments and resistances?
- Who are the key players?
- What are the individual and organizational needs?
- What mechanisms exist or should be created to ensure resolution of differences?
- Is there a senior manager — a fixer — who has the authority and influence to deal with the problems?
- Is there a charter or other document that outlines the OA mission and the OA team's authority?
- Does the system meet local needs, or will it be seen as imposed by outsiders?
- How can change be minimized without sacrificing system goals?
- Can training, briefings and feedback opportunities help alleviate fears?
- How can rumors be dispelled quickly?

One quantifiable method of looking at your political environment is the Prince Political Accounting System. The steps of the system are reviewed in Figure 1 on Page 71. In Figure 2, the system has been applied to a brief example. For more details, further reading is necessary.

☐ Define the issue. The issue should be specific and should begin with an active verb. It should also have significant support and opposition (which poses a political problem).

☐ Identify the actors. Actors are people who should be considered in making the decision or carrying it out.

In our personal computer example (Figure 2), the number of actors was limited for illustration purposes; in real situations the number may be as high as 20.

☐ Estimate the issue position, power and salience for each actor and assign a value to each. Issue position is the attitude of the actor toward the position (value +3 to -3). Power is the degree to which the actor will exert influence, directly or indirectly, in support of or in opposition to the decision (value 1 to 3).

Salience is the importance the actor attaches to supporting or opposing the decision relative to other decisions with which the actor is concerned (value 1 to 3).

☐ Calculate the weights for each actor and for the whole system. Actor weights are multiplied and the system weight is a total of the actor weights.

☐ Calculate probabilities by determining the values shown in the example. Using the values from step four, determine:

A = The added scores of issue position supporters.

B = The added absolute value scores of actors opposing the issue.

C = The scores of actors with an issue position of zero.

D = The total of A + B + C.

E = The total of A + 1/2C

Probability of support = E/D

☐ To determine strategies, consider whether you want a higher or lower probability. Then, determine your strategy, such as:

- Compromise. Get the most important components of what you want and make the opposition as happy as possible.
- Stimulate actors not currently involved to become interested or powerful.
- Change the position of actors to agree with your position through arguments, promises, threats, friendships and so on.
- Raise salience by distributing information or creating publicity.
- Lower salience by avoiding publicity or directing attention to another issue.

Politics is real. Although its effects may appear crazy on the surface, the reasons behind political actions are understandable. Because OA systems usually imply change, politics thrives in the OA environment.

Through proper assessment and strategy building, however, negative political influences can be conquered. OA

Barnes is a senior product developer for Deltak, Inc. Her specialties include integrating data processing and word processing and user responsibility in information management. She is completing an MBA at the University of Phoenix.

1.	Implement a personal computer network among top managers.		
2.	Actors: company president, MIS director, two user vice-presidents.		
3.	Issue Position:		
	President	0	(neutral)
	MIS director	+3	(supports implementation).
	User VP1	-1	(slightly against implementation).
	User VP2	-3	(strongly against implementation).
	Power:		
	President	2	(moderate power).
	MIS director	3	(substantial power).
	User VP1	1	(slight power).
	User VP2	3	(substantial power).
	Salience:		
	President	1	(slight concern).
	MIS director	3	(high priority).
	User VP1	1	(slight concern).
	User VP2	2	(moderate priority).
4.	President	(2)	(0x2x2)
	MIS director	27	(multiply each weight).
	User VP1	-1	(multiply each weight).
	User VP2	-18	(multiply each weight)
	Total Weights	10	(add all numbers in Step 4).

5. A = 27 (Added scores of Issue Position supporters).
B = 19 (Added absolute value of actors opposing issue).
C = 2 (Scores of actors with Issue Position of zero).
D = 48 (Total A+B+C).
E = 28 (Total A+1/2C).

$$\text{Probability of support} = \frac{E}{D} = \frac{28}{48} = .58 \qquad (58\%)$$

6. Strategies.

Based on *Everyman's Prince: A Guide to Understanding Your Political Problems*, by William D. Coplin and Michael K. O'Leary, 2nd. ed., North Scituate, Mass., Duxbury Press, 1976.

Figure 2. Prince Political Accounting System Example

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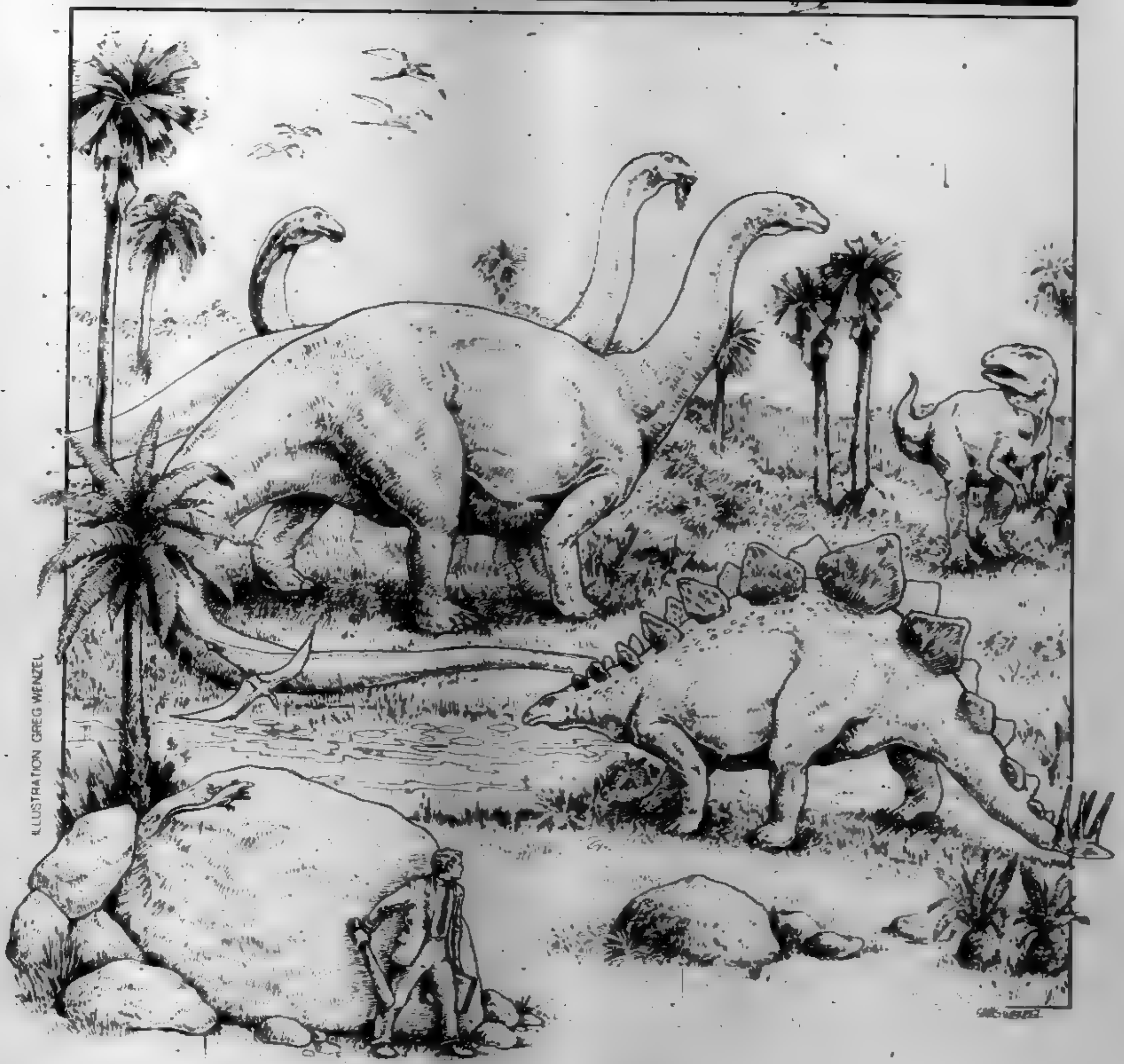

ILLUSTRATION: GREG WENZEL

Change Is Inevitable

Mired in out-of-date equipment and procedures? Your staff and management may not make it easy to get rid of those dinosaurs.

By Philip J. Berg

If we examine today's office, it is evident that many individuals and organizations are mired in the past. Outstanding new technology is available for both hardware and software, yet there is a reluctance to upgrade the environment and to take advantage of the new technologies. This reluctance stems from two basic sources — individual attitudes and organizational philosophies.

In speaking with a wide cross-section of people at many different companies, one encounters a number of interesting comments about office automation:

"I can't use a terminal." At a time when computer-based technology touches almost every aspect of our lives, many people are still afraid of computer terminals. However, anyone who has ever tried the hunt-and-peck technique of typing should be able to use a computer terminal. In fact, some computer-based office telephone systems are more difficult to use than a terminal. Even those rare individuals who have no keyboard experience at all should be able to master this skill in a few hours — if their mental blocks can be overcome.

Certainly, this fear will gradually disappear now that schoolchildren

"Individual attitudes that impede office automation can often be overcome by a strong management directive. However, when the real difficulty lies with the organization's philosophy, the move forward goes even more slowly."

see and use computers on a regular basis. But can office automation wait until these new generations of computer-literate children have completely replaced the older generations of office personnel?

"Only technicians use terminals." Some within the business community look upon terminal use as degrading, or at least not for them. However, many believe the terminal must become as much an integral part of the office environment as the telephone. The negative attitude toward terminals is especially harmful toward electronic mail, because it can succeed only if virtually everyone in the organization uses it.

Fortunately, some electronic mail systems offer features that allow mail-handling (and terminal use) to be delegated to secretaries, administrative assistants and so on. Such measures can help ensure that even the terminal-phobic will have access to electronic mail correspondence.

"I have to have hard copy." Maybe we are all a little reluctant to part with hard copy. After all, a feeling of security is generated by being able to hold something tangible in our hands. (This dependency is sometimes carried to an extreme. Too many organizations mandate 10 copies of everything as company policy.) However, hard copy is more often a security blanket than something truly necessary. A letter is as easily viewed on a terminal as it is on paper.

The real problem with paper is that, in large quantities, it becomes unmanageable. If someone has piles and piles of paper on his desk and claims he can reach into any pile and pull out what he needs, one has to wonder whether it is true or simply a rationalization. One also has to wonder if it is better to have these paper stacks than to have ordered, sorted lists on a terminal screen. Computers are capable of storing large amounts of information and of easily indexing them for convenient access. Why should every individual in a company be burdened with that job as a manual task?

Certainly there are times when hard copy is required. Good electronic mail systems will produce hard copy when necessary. After all, a primary goal of electronic mail is the reduction of hard-copy use and soaring paper costs.

"I don't want to have to sign onto a terminal." This is perhaps the most difficult attitude to overcome. Those who are not willing to sign on to the system frustrate those who send them information. Eventually, this may have a domino effect and discourage previously satisfied users from communicating electronically.

Naturally, methods exist to combat this attitude — convenient placement of terminals, user education and, if all else fails, even a corporate mandate. It is also helpful to impress upon these resistors that the average user can handle his mail in 15 to 20 minutes daily with an electronic system. This is a far shorter period of time than is normally spent when paper, dictation, typing, manual filing and copying are parts of the process.

Technological reluctance can also be overcome if advocates of electronic mail promote its use, even to the extent of refusing to send nonelectronic messages. This forces nonusers gradually, but subtly, at least to attempt to use the system. There is, after all, a natural curiosity in all of us, especially where mail is concerned.

Individual attitudes that impede office automation can often be overcome by a strong management directive. However, when the real difficulty lies with the organization's philosophy, the move forward goes even more slowly. Among the more frequently stated organizational objections are comments such as:

"Our organization does not have enough correspondence." Few companies have ever analyzed their internal message traffic thoroughly. In fact, the methods used to disseminate mail and to conduct intercompany communication make it difficult to assess the volume of communication accurately. With traditional methods, one can only wonder how often mail is lost or not sent at all, for one reason or another. Judging from paper purchases and the use of reproduction facilities, many businesses appear to be drowning in paper.

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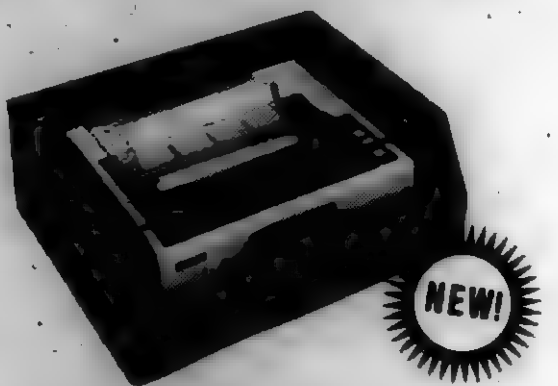

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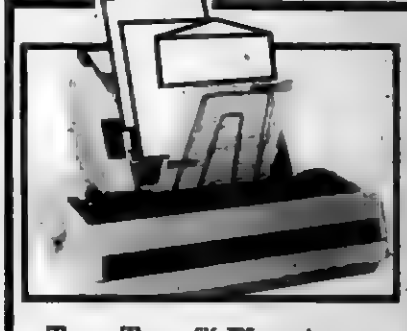

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"The need for office automation exists within most companies. The real issue should be how to judge a good system, how to incorporate it into the work flow without disruption and how to manage it when it is in place."

"We prefer to keep our operation decentralized." Organizational opinions divide on the issue of centralization vs. decentralization. Historically, departments have often been autonomous in relation to such areas as equipment purchases. As a consequence, many companies are overrun with many totally different word processors. Although these word processors accelerated the production of written material, they rarely improved communications because different brands of word processor are rarely able to talk to one another. Improved communication is, after all, a primary OA goal. Installing large quantities of incompatible equipment hasn't accomplished too much.

Obviously, good communication can occur only when the participants in the dialogue are somehow linked. Telecommunications, coupled with a good electronic mail system, offers the opportunity to interconnect all individuals in a company, and, thus, to provide an open channel for communication. But to work properly, the approach must be centralized so that any one department can make contact with any other. If the approach is decentralized, it may improve intradepartmental communication, but certainly not interdepartmental activity. Someone still has to walk the paper from one department to another.

"Electronic mail is not compatible with our existing procedures." Inertia is compelling. In many businesses, the way things are done is the way they will be done for years to come. "We've always done it this way," is a common rationale.

One prerequisite of the automated office is a thorough review of existing business procedures. Are there good reasons for the way things are currently done? Can some procedures be improved with new methodologies? Real improvement is possible only if an organization is willing to examine its current office and business practices with total honesty. These examinations will almost always identify many areas that could be improved substantially and will expose potential benefits of OA.

"We have to establish a committee to decide." Committees often lose sight of their charters. Instead of performing a thorough analysis of an organization's requirements, committee workings sometimes deteriorate into personality conflicts and clashes over personal preferences. Certainly, no decisions on OA should occur without suggestions and opinions from all part of the organization. Yet conventional committees are not the answer.

The alternative is an advisory committee, which merely presents its findings and a summary of the organization's requirements, but does not offer specific conclusions. A unilateral decision can then be made by someone at a much higher level. This avoids evaluations which become clouded by interdepartmental rivalries.

"We are not sure we are ready for OA." What constitutes readiness for OA? Surely not the lack of technology, most of which is already available. In many cases, not being ready is analogous to being afraid of the new technology — afraid of upheaval, of unexpected implications and of the unknown.

The need for OA exists within most companies. The real issue should be how to judge a good system, how to incorporate it into the work flow without disruption and how to manage it when it is in place. The sooner organizations begin to move in this direction, the sooner they will begin to solve the myriad number of problems that exist in today's office.

Yet there are potential pitfalls in the move toward office automation. Not all companies that produce OA products offer complete solutions. Some may produce a single product — one that represents only a small part of the total solution — and then divert their efforts to other areas. In selecting a vendor, whether for hardware or software, the purchaser should be certain that vendor has a real long-term commitment to OA. And if the company expects to acquire a variety of products, all must be integrated to work together effectively.

"We can't afford it." It is not inexpensive to implement an automated office. At the same time, there are enormous potential financial benefits, some of which are not immediately realizable.

Any serious economic analysis must examine all factors carefully. Tangible savings — those of paper, equipment, postage and telephone — are measurable with some effort. The intangible ones, like the value of timely communication, improved morale and time savings, are more difficult to assess, but they are not less important. If all factors are brought into the equation, most organizations will discover they cannot afford not to automate.

Overcoming negative attitudes and philosophies is not easy. It would be easier to wait for the entire office work force to achieve a level of computer literacy, but businesses may suffocate under mountains of paper before this happens. Negative influences can be combatted. Organizations should take every opportunity to educate employees in the benefits of a modern approach. Often, simply exposing people to these technologies goes a long way toward overcoming reluctance, especially when the new system is user-friendly.

Nor can the financial aspect be overemphasized. Office automation is in the best financial interest of the corporation, a point that certainly should not be lost on corporate management. For individuals working at lower levels within the organization, where job boredom is often a serious problem, the opportunity to use new technologies can be stimulating and can minimize that boredom and drudgery.

The difficulty of overcoming negative attitudes should not be underestimated. Nevertheless, it is essential that organizations undertake the effort if they are to reap the substantial benefits that OA can bring. **OA**

Berg is a vice-president of Applied Data Research, Inc. in Princeton, N.J. and is responsible for several OA projects at ADR, including electronic mail, WP and decision support.

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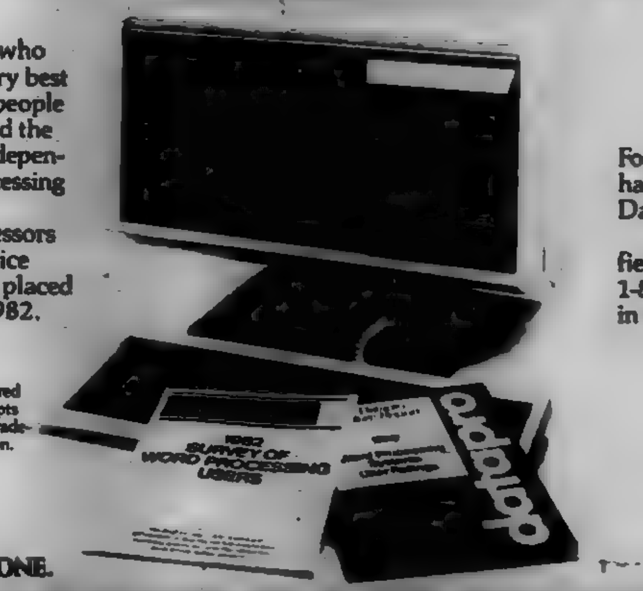

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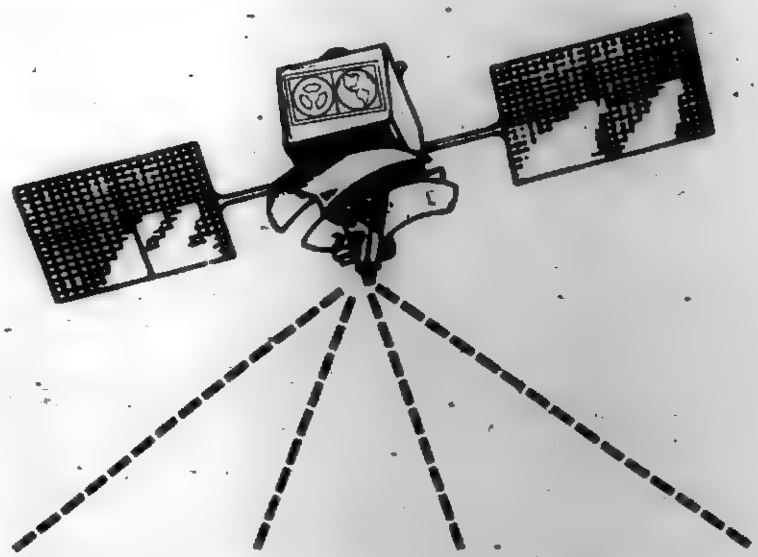

We are launching a new publication devoted to in-depth coverage of the broad spectrum of voice, image and data communications. *Computerworld On Communications* will examine communications issues, technology and applications from a systems perspective.

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OA

So many questions crop up when you automate: Wait or jump in now? What equipment? Lease or buy?

Decisions Decisions

By Thomas R. Mylott III

Some companies are as eager to select from among the available office automation options as they would be to ramble along a poorly marked path through a mine field. A confusing matrix of alternatives confronts those who think about leasing or buying OA goods and services. By systematically answering some preliminary questions, however, present and potential OA users can keep both the forest and the trees of options in focus. In evaluating alternatives, the OA user may find that the difficulty in obtaining answers is the result of not knowing the preliminary questions.

A primary question involves which general category of OA goods and services the OA user should select. A user can follow any of four paths to office automation:

- Acquisition of single-function OA equipment.
- Software and hardware supplements to mainframe or minicomputer systems.
- Personal computer systems.
- Connection to a network.

Single-function OA equipment is usually a combination of hardware and software dedicated to a specific OA function such as word processing. In many ways, this choice presents the easiest solution for the prospective user. Manufacturers of OA equipment design it with the needs of the office in mind. Keyboards, for instance, will be laid out well. Vendor training focuses on personnel with the experience and level of skill customarily found in the office. Those who offer OA equipment have specifically targeted office automation as their market.

However, few standards exist in OA equipment technology. One vendor's storage media will rarely function on another vendor's machine. Training for one type of word processor is of minimal use on a competing model. As a result, unless a user wants to create its own OA Tower of Babel, the incentive is to commit to one vendor's technology. After that commitment is made, any change is likely to involve not only substantial retraining, but also translating data from the previous storage media to the new media. Moreover, since much OA equipment is single-function, a need for additional OA functions will force a user to acquire a new technology or more OA equipment.

The alternative of supplementing an existing computer system with OA hardware and software presumes, of course, that the user has an existing computer system.

If a mainframe or minicomputer system is available, the OA user will often use the central computer resources of the company and be one more user among many others. For an OA user to be able to use a centralized computer system most effectively, the mainframe or minicomputer system must be configured to permit some type of on-line or time-sharing processing. Batch runs are not well-suited to OA applications. Moreover, the control over hardware and software in such an operation will almost never rest with the OA user, but rather will reside with those who control the DP function within the company, usually a DP department.

This lack of control is an important consideration. The OA user is likely to be competing for the computer system resources, such as machine time and data storage. If for some reason payroll, inventory or some month-end processing task needs those resources, the OA applications are likely to be the first passengers bumped.

The OA user will also be vulnerable to whatever the centralized system is vulnerable to. When the system goes down, the OA applications go down with it. Along with losing control over the processing aspect of the OA applications, the OA user is also likely to lose control over the data itself. Without a centralized system, users have the option of storing their data at their own workstations and in their own departments, but in a centralized system, the data storage is also likely to be centralized. Centralization of data presents problems of security, control and integrity of data which are different from those of dispersed storage. When users cannot control their data, they often must adjust to forms and formats not necessarily suitable for their needs.

Small general-purpose computers known as personal computers offer the OA user a tantalizing alternative. Most hardware and software in the personal computer range is quite inexpensive. Some hardware is so portable its user can literally lock it up like a briefcase and place it under an airplane seat. Several portable models are now on the market.

Low cost and flexibility are the major attractions of personal computers. They can perform both OA and other functions, such as spreadsheet analysis and electronic filing. Hundreds of software packages are available for non-OA functions.

> **"Many users who have recently acquired systems are haunted by the possibility of a substantial decrease in price or a quantum leap in performance of systems on the market. Nevertheless, hesitation out of fear of committing to a technology is misplaced. Users should also analyze the costs of failing to increase their present office productivity."**

A personal computer allows the user to customize data. Increasingly, users can, with little difficulty, transport personal computer software and data from one manufacturer's machine to that of another. For some personal computers, more than one version of an application is available. For example, several different WP programs are available for the more popular models.

One major obstacle to the use of personal computers for OA is that few are specifically designed for the office. Keyboards are often poorly arranged; video screen designs often do nothing to reduce eyestrain. The training available for using personal computers most often consists of a manual that tries to train those who will train themselves. However, some personal computer software applications are so well designed that learning to use them is easy.

Many network alternatives are available for consideration. The general principle of a network is the ability of workstations to communicate with other equipment in some manner. A network could consist of OA equipment, personal computers or existing centralized computer systems, connected to each other in many different combinations. A technology now emerging is a network in which personal computers are interconnected with or without a centralized (host) computer system. Several personal computers are already able to communicate with mainframe and minicomputers. A network allows the user to maintain the advantages of using OA equipment or personal computers and provides the means for new OA applications such as electronic mail.

After deciding which of the acquisition alternatives to pursue, the OA user must then decide whether to buy now or wait until the price falls or the power of the equipment increases. The rapid pace of technological change has led to a dramatic decline in prices and an increase in power and capacity of computer equipment. Software also costs less now than it did in the past. With the decline in software and hardware prices has come a proliferation of alternatives, and selection has accordingly become more difficult. At the same time, however, the possibility of finding suitable hardware and software has increased.

The pace of change also means current technology is becoming obsolete far more quickly than before. Many users who have recently acquired systems are haunted by the possibility of a substantial decrease in price or a quantum leap in performance of systems on the market. Nevertheless, hesitation out of fear of committing to a technology is misplaced. In addition to weighing the costs of having purchased a system that may become obsolete, users should also analyze the costs of failing to increase their present office productivity.

Another way of deciding whether to buy or wait is to assess the functions for which the equipment could now be used and to contrast them with the improvements in price or performance the future might offer. If the equipment will be sufficient and cost-effective for the tasks at the present time, the possibility that there will be a better alternative in the future may not matter. The pocket calculator of 10 years ago is just as useful for arithmetic as is the 1983 version. Moreover, while the pace and character of technological change is entirely speculative, a user can obtain immediate savings and increased productivity from equipment now available.

Finally, technical obsolescence has two faces. Equipment can be totally unable to function with new technology; the old hand-cranked telephones will not function with present telephone networks. However, equipment can be a prior generation of technology. Although it may no longer offer a purchaser the optimum performance for the price, it might still perform satisfactorily. Rotary-dial telephones are common and perform well despite the introduction of tone-generating telephones. Careful selection of a technology in widespread use is unlikely to leave the OA user stranded when that technology changes.

Having decided to make an acquisition, a user will have to choose between purchasing or leasing. The decision to lease or buy is a decision about hardware, not software. Software is usually distributed under a license, which is a legal concept distinct from leasing or buying. There are two basic categories of leases: full payout and operating.

The full payout lease has the following characteristics:

- It is usually long term.
- The sum of the rental payments is approximately equal to the purchase price of the equipment.
- The responsibilities of ownership usually reside with the user (lessee).

The operating lease differs in that:

- It is usually short term.
- The sum of the rental payments is less than the purchase price of the equipment.

Rental payments in a full payout lease are often lower than in an operating lease. If a full payout lease provides the lessee with an option to purchase the equipment at less than market value, then the lease can be viewed as an installment purchase.

The two basic methods of financing a lease are through a nonleveraged lease or a leveraged lease. In the nonleveraged lease (also known as a straight or direct lease), the owner (lessor) has acquired the equipment with its own funds. Only the lessor-owner and the lessee-user are involved.

In a leveraged lease, a third party loans the lessor a substantial amount of the money necessary to acquire the equipment. The lessor-owner, lessee-user and lender are all involved in a leveraged lease.

Sometimes the decision to buy or lease is a question of the user's ability to obtain financing for a purchase. The cost of money and the lease rates available will influence the user's ability to purchase.

The decision to lease or buy is also dependent in part on the income tax consequences of the decision. If the OA user leases hardware, he can usually deduct from taxable income all of the lease payments during the year. This means that lessee-users can reduce their taxable income by the same amount they actually spent on the equipment.

However, users who purchase

can generally deduct only a portion of the purchase price from their income; they must depreciate the equipment. Purchasers cannot reduce their taxable income by the same amount they actually paid for the hardware in the year they paid it. However, the tax laws do allow purchasers a bonus, the investment tax credit (ITC). ITC is calculated as a percentage of the purchase price which the purchaser may subtract, not from taxable income, but from taxes actually owed..

The decision to lease or buy could therefore depend on the tax situation of the user. The tax implications can be quite complicated. Recent changes to the tax laws have added new wrinkles to the buy-or-lease decision. Before making a final decision, a user should obtain professional legal and accounting advice.

A lease can also be a hedge against obsolescence. Users who do not own hardware are not stuck with it when the technology advances. Of course, this is not necessarily true in a full payout lease — particularly one with an option to purchase at a nominal price. In any lease, the user will still have to pay the rent for the full term, and a long-term lease means many payments. Lessors who lease equipment for short periods of time estimate the market value that equipment will have at the end of the lease. If the technology advances, the market value of the equipment normally declines. If the lessor has overestimated the future market value, the transaction will have unprofitable consequences for the lessor. As a result, the rental rates in a short-term lease will likely be high if the lessor is worried about the equipment becoming obsolete.

> ***"The user who has an obsolete technology on order is in a much worse situation than one who acquired a technology that later became obsolete."***

In any acquisition, many legal issues should be considered, and users should obtain legal advice before signing anything. In OA acquisitions, two important legal issues are frequently underestimated: The effect delay in delivery will have on the procurement, and the relationship between multiple computer purchases and software.

There is usually little delay involved in the purchase of personal computer systems. Users can purchase systems literally right off the shelf at a computer store. Other equipment and volume purchases of personal computers freqently result in a waiting period between ordering and delivery. When confronted with a possibility of delay beyond the expected delivery, a user must carefully evaluate the delay's impact in advance.

Delays are not uncommon and they vary according to vendor and equipment. A delay of several months may not seem like a long time, but in terms of advances in computer technology, especially at the personal computer level, a few months could make a great difference in what the market offers. The user who has an obsolete technology on order is in a much worse situation than one who acquired a technology that later became obsolete. In most contracts for computer hardware, failure to deliver on time is not a breach of contract. If the consequence of a delay in delivery will be serious, the OA user must ensure that the contract provides a remedy for the user in the event of such delay.

The other often-neglected legal concern occurs when an OA user purchases multiple computers or moves software from one machine to another. Many software licenses prohibit using one copy of software on more than one machine. Some prohibit sharing one machine's software resources with other machines even if the software itself is never transferred. The OA user must carefully examine all software licenses and negotiate changes for those that are not appropriate for the software's intended use.

Finding answers to the preliminary questions raised here will suggest subsequent lines of inquiry. The answer to one question is likely to remain unchanged: the cost of failing to use OA technology to improve office productivity will increase while the cost of OA technology will decrease. OA

Mylott, an attorney with the Dallas law firm of Peter S. Vogel, P.C., has been involved with computers for over 15 years and hold a Certificate in Data Processing.

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*Source: 1980, 1981, and 1982 surveys among users of word processing equipment by Datapro Research Corporation.

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So, if you're involved in OA planning and decision-making in your organization, you'll want to read the next issue of *Computerworld OA* with the OA Focus on workstations. The issue date is April 20. The deadline date for advertisers to remember is March 11th. (Materials are due one week later.)

For advertising details on *Computerworld OA* and the people who read it, call Don Byrnes, National Accounts Manager at (312) 827-4433 or contact your local *Computerworld* representative.

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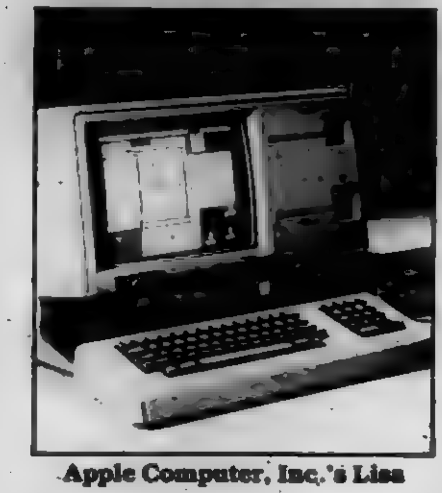
OA TECHNOLOGY

Apple Computer, Inc. introduced a 16-bit microcomputer that reportedly allows several applications to be run simultaneously. Known as Lisa, the system is aimed at the professional and executive OA market. Six integrated application software packages that reside in a 5M-byte hard-disk system include an electronic spread sheet, word processing, two business graphics packages, a data base facility and a project management package.



Apple Computer, Inc.'s Lisa

Several documents can be displayed on the system's 12-in screen simultaneously, and users can switch at will from one package to another without having to swap floppy diskettes, Apple said. Users can also pass data back and forth with the use of a "mouse."

Built around a Motorola Corp. MC68000 microprocessor, a standard package with 1M byte of main memory and two 5¼-in floppy disk units, a 5M-byte hard-disk unit, six programs and a display screen with keyboard, costs $9,995. Shipments are scheduled for spring.

The firm also announced the Apple IIE, an enhanced version of the existing Apple II, costing $1,395.

In addition, Apple is offering a hardware/software interface said to allow Apple personal computers to communicate with IBM mainframes. The 3270 cluster controller emulator will imitate IBM terminal functions, enabling Apple users to perform on-line data entry, inquiry and response, electronic mail, remote data base access and program development, Apple claimed. The device will be available in a System Network Architecture/Synchronous Data Link control version that emulates the IBM 3276 Control Unit Display Station and a binary synchronous communications version that emulates the IBM 3271 Cluster Controller.

Priced at $1,000/port, the product is slated to be available in mid-1983. Apple is based at 20525 Mariani Ave., Cupertino, Calif. 95014.

Two microcomputers and a local-area network that links the systems with the IBM Personal Computer and Apple Computer, Inc.'s Apple II were unveiled by **NCR Corp.** The systems on the Decision Mate V series include an 8-bit Zilog, Inc. Z80A-based system and an 8/16-bit Z80A and Intel Corp. 8088-based system. Both run under the Digital Research, Inc. CP/M and Microsoft, Inc. MS-DOS operating sytems. External plugs permit users to add subsystems (including a diagnostic module that locates faults) to the units' backplanes.

The NCR Decision Mate V

The 8-bit system's basic configuration consists of two 512K-byte floppy disk drives, 64K bytes of main memory, a 12-in. CRT, detachable keyboard, an operating system and a bit-map graphics subsystem that contains its own processor and memory for $2,800. The 8/16 system costs $3,340 and has an added 8088 chip. The Decison Net local-area network supports up to 63 users simultaneously and costs $500 per connection. NCR is at 1700 S. Patterson Blvd., Dayton, Ohio 45479.

A new generation of personal computer software which will reportedly let any personal computer user work with a variety of application products at one time has been announced by **Visicorp**. With VisiOn, applications are displayed on a screen that corresponds, visually and dynamically, to a business professional's desktop, according to the vendor. This product is reportedly hardware and operating system independent and takes just 30 minutes to learn.

The initial product offering, slated for this summer, will include spreadsheet, word processing, data base management and graphics. Pricing is not yet available. The vendor is located at 2895 Zanker Road, San Jose, Calif. 95134.

The Philips 3004

A stand-alone word processing system that combines WP and DP capabilities has been announced by **Philips Information Systems, Inc.** The Series 3000 features console, detachable keyboard, dual 5¼-in. diskette drives and a letter-quality printer for $9,900.

The vendor also announced an office mail system called the Information Management Facility, which reportedly provides a means of sharing information among users of Philips' computers. This software is priced from $45,900.

Philips is at 4040 McEwen, Dallas, Texas 75234.

Sord Computer Systems, Inc. of Japan unveiled its first series of microcomputers to the U.S. recently under the Socius brand name. The company's product line includes the Socius M23P, an 8-bit lightweight machine with 128K bytes of memory ($2,595); a Zilog, Inc. Z80A-based desktop business computer called M23 Mark III, which also has 128K bytes of memory ($2,695); the M23 Mark V, with the capabilities of the Mark III plus two IBM-compatible 8-in. floppy disk drives for increased storage capacity ($3,495).

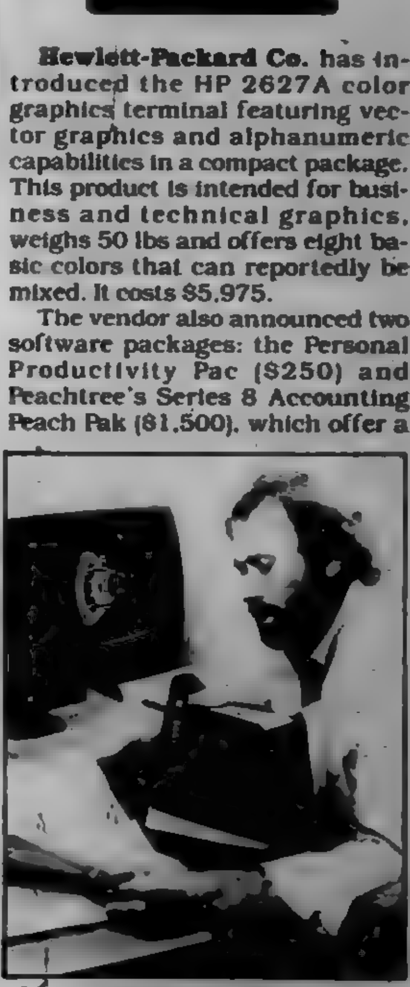
Sord's M343

Also announced were the 16-bit M343 system, which includes an Intel Corp. 8086 microprocessor and 256K bytes of memory and which can use either hard or floppy disk storage systems, according to the vendor ($6,000).

Finally, a home computer was also announced, the M5 ($247). Further details are available from the vendor at 200 Park Ave., New York, N.Y. 10166.

Hewlett-Packard Co. has introduced the HP 2627A color graphics terminal featuring vector graphics and alphanumeric capabilities in a compact package. This product is intended for business and technical graphics, weighs 50 lbs and offers eight basic colors that can reportedly be mixed. It costs $5,975.

The vendor also announced two software packages: the Personal Productivity Pac ($250) and Peachtree's Series 8 Accounting Peach Pak ($1,500), which offer a large number of office capabilities.



HP's Model 2627A

HP can be reached for further details at 1820 Embarcadero Road, Palo Alto, Calif. 94303.

American Bell, Inc.'s Advanced Information Systems Division unveiled the Dimension AIS/System 85, and a series of AIS/System 85-compatible terminals. The 300- to 900-line, 19.2K bit/sec digital PBX features voice, data, office and building management applications. The System 85 is an enhanced version of earlier Dimension models, which featured only analog transmission. Available by mid-'83, on a lease-only basis, the PBX, also known as "Antelope," runs over twisted-pair wiring at potential speeds of up to 64K bit/sec., the firm said.

An average 600-line configuration will cost $12,500/mo on a lease basis. The 7000 series terminals are available under lease or purchase terms with price ranges from $735 to $1,500, and $5.50 to $21 when leased.

North Star Computers, Inc. has unveiled a software package that reportedly provides a 2780/

OA TECHNOLOGY

3780 bisynchronous communications link between North Star microcomputers and large mainframes and minicomputers. The Northlink 2780/3780 Bisyhc is priced at $499.

The vendor also introduced a graphics package intended for the small business market. Called the North Star Graphics Family, this software features split-screen capabilities and a number of graphics formats and functions. It runs under the vendor's version of Digital Research, Inc.'s CP/M operating system. The bundled version of the graphics family costs $799, but is available in modules. North Star is based at 14440 Catalina St., San Leandro, Calif. 94577.

A local-area network product line that runs over coaxial able in a "twin ring" has been unveiled by **Racal-Milgo, Inc.** The Planet Token Ring series can reportedly be configured to meet a number of application specifications and can accommodate up to 500 communicating devices, according to the vendor. The communications link is controlled by the Planet Director, a desktop intelligent network processor; system interface is provided by Terminal Access Points. These items sell for $9,450 and $2,250 respectively. Racal Milgo is at 8600 NW 41 St., P.O. Box 520399, Miami, Fla. 33152.

A family of dual-processor-based desktop microcomputers featuring 8/16-bit technology has been introduced by **Compupro Systems**. The System 816 series is configured around an Intel Corp. 8085/8088 CPU and offers capabilities ranging from a single-user workstation to a high-performance multiuser system supporting users under Compupro's proprietary MP/M 8-16 operating system.

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according to the vendor. Prices for this system start at $5,495. Further details can be obtained from Compupro at Oakland Airport, Calif. 94614.

A 16-bit microcomputer offering a Zilog, Inc. Z80A microprocessor along with either an Intel Corp. 8086 or a Motorola, Inc. 68000 processor has been unveiled by **Datamac Computer Systems**. The Series 1600 can operate under a number of popular operating systems, and features Intel's Multibus, allowing configurations from a small three-card system to a large seven-card system, the vendor said.

Other features include Help keys, 12 programmable function keys, CRT screen controls, an 8-MHz processor and a firmware-based Systems Activity Monitor that reportedly enables local and remote users to display and alter memory. Prices for this system range from $3,300 to $8,000, Datamac said from 680 Almanor Ave., Sunnyvale, Calif. 94086.

Digital Equipment Corp. has introduced software and hardware enhancements for its Professional 300 series line of personal microcomputers. The software offerings include a word processing package ($295), IBM communications capabilities featuring bisynchronous and Systems Network Architecture-compatible emulators ($595). Also announced were Professional Tool Kit versions of Cobol, Dibol and Pascal software languages, priced at $2,300.

The hardware included a Digital Research, Inc. CP/M option for $695; an upgrade kit for the firm's Professional 325 to 350, priced at $2,300; and a 256K-byte memory add-on option that enables a system to expand up to 1M byte of memory, for $795.

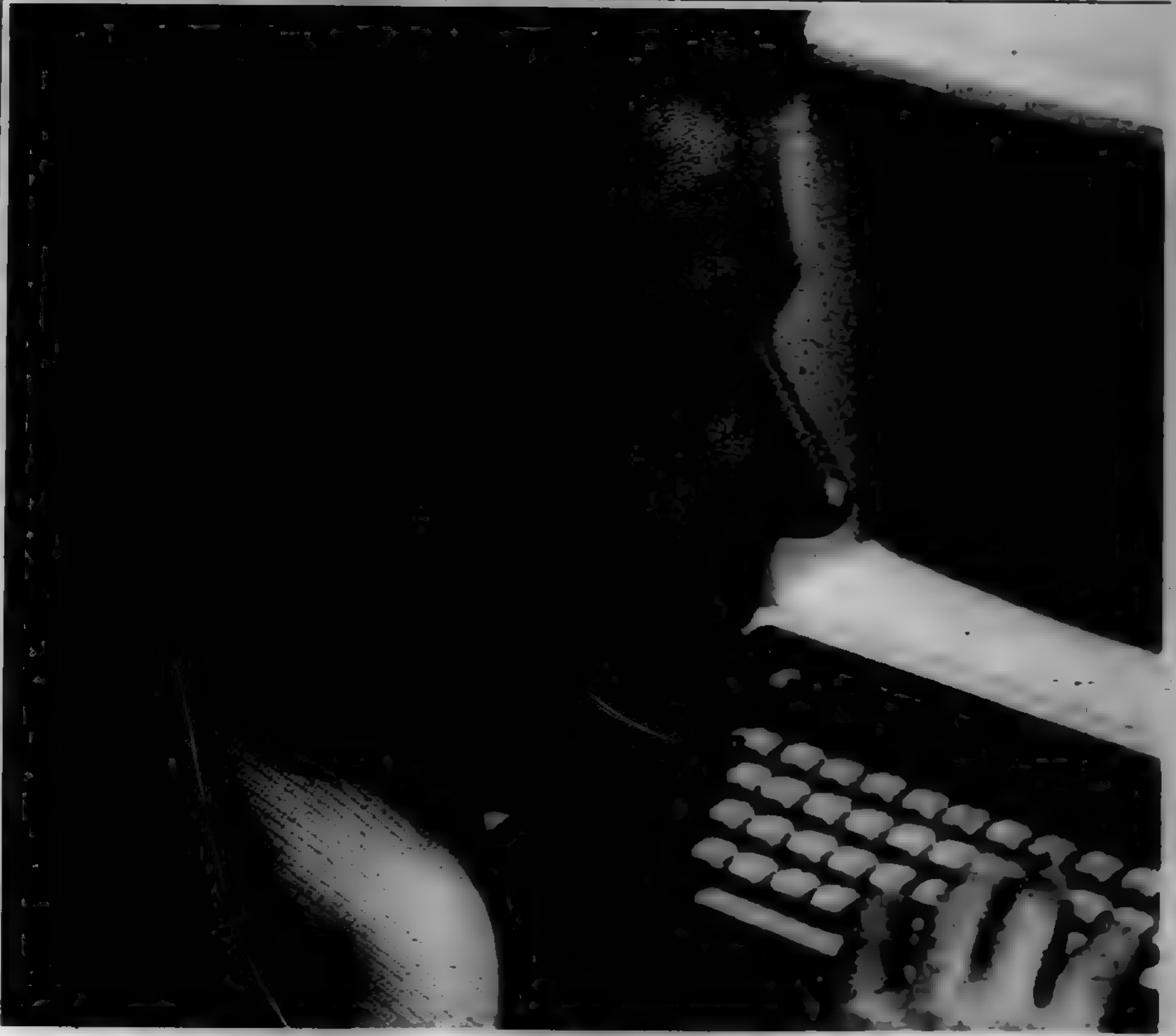
The company has also reportedly expanded its All-in-1 office system product line with more memory and greater resources. Based on the company's latest disk products, the RA81 fixed-medium drive and the RA60 removable-drive, this system is configured around DEC's VAX-11/750 or VAX-780 processors, a DEC magnetic tape drive, 3M to 4M bytes of memory, software and up to 40 communications lines. Prices range from $168,300 to $318,600, DEC said from Maynard, Mass. 01754.

Wang Laboratories, Inc. has unveiled a smaller, a larger and an expanded version of its Wangnet broadband local-area network. Wangnet cable kits will offer a reduced-scale turnkey networking configuration, while the span for the larger Wangnet configurations has been expanded to service multibuilding environments, Wang said. Also, the number of channels used to support non-Wang systems and terminal attachments has been increased. Kits vary in cost from $1,350 to $10,000, the vendor said from 1 Industrial Ave., Lowell, Mass. 01851.

Rolm Corp. has unveiled Phonemail, a voice mail system for use on its CBX private branch exchange (PBX) that reportedly combines the capabilities of telephone answering, message notification and voice store-and-forward into one integrated package. It consists of an application processor tied to the CBX, and messages are stored on Winchester disks. Users can reportedly call the system day or night for messages.

Available in various configurations, hardware costs start at $50,000. Software may be licensed on a monthly basis for $600, or purchased for $20,000. Further details are available from Rolm at 4900 Old Ironsides Drive, Santa Clara, Calif. 95050.

3M Corp. has announced an electronic mail system for turnkey, stand-alone use in medium-volume business operations. The Whisper Electronic Message Exchange handles messages, sales and service orders, according to the vendor. Rental fees for this product start at $1,500/month, 3M said from Department BC82-18, P.O. Box 33600, St. Paul, Minn. 55133.



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Feb. 27-March 4, Oak Brook, Ill. — **DP Training Managers' Workshop.** Also Dallas, April 10-15, and San Francisco, April 24-29. Contact: Deltak, Inc., East-West Technological Center, 1751 West Diehl Road, Naperville, Ill. 60566.

Feb. 28, New York — **Office Automation: Implementation.** Also Los Angeles, March 14; Boston, March 21; Denver, April 4; Chicago, April 25; Houston, April 26. Contact: Digital Equipment Corp. Educational Services, Seminar Programs, 12 Crosby Drive, BUO/E58, Bedford, Mass. 01730.

March 2-4, Los Angeles — **SNA and Teleprocessing Access Methods.** Also Boston, March 9-11 and Dallas, March 28-30. Contact: Center for Advanced Professional Education, Inc., 11928 N. Earlham, Orange, Calif. 92669.

March 3-4, Hartford, Conn. — **Introduction to Teleprocessing.** Contact: Seminar Administrator, NHC Resource Center, New Hampshire College, 2500 N. River Road, Manchester, N.H. 03104.

March 4-5, Providence, R.I. — **Conference on Computer Technology: The Challenge to Business and Industry.** Contact: Registration Office, Aiesec, Box 1930, Providence, R.I. 02912.

March 7-8, Houston — **Office Automation: Strategies.** Also Philadelphia, March 15-16; Detroit, March 28-29; San Francisco, April 11-12; Washington, D.C., April 19-20. Contact: Digital Equipment Corp. Educational Services, Seminar Programs, 12 Crosby Drive, BUO/E58, Bedford, Mass. 01730.

March 8-9, Austin, Texas — **Association for Computing Machinery Sigcomm '83: Symposium on Communications Architecture and Protocols.** Contact: Rebecca Hutchings, Honeywell/FSD, 7900 Westpark Drive, McLean, Va. 22102.

March 9-10, New York — **The New Local Telecommunications Business: Linking the Office to the World.** Contact: Probe Research, Inc., P.O. Box 590, Morristown, N.J. 07960.

March 9-11, Baltimore — **Design and Management of Local-Area Networks.** Also Tampa, Fla., March 16-18; Dallas, March 23-25; Columbus, Ohio, March 28-30; New York, April 4-6; Los Angeles, April 13-15; and Boston, April 20-22. Contact: Center for Advanced Professional Education, Inc., 11928 N. Earlham, Orange, Calif. 92669.

March 14-17, Washington, D.C. — **Seventh Annual Federal Office Systems Expo.** Contact: National Trade Productions, Inc., 9418 Annapolis Road, Lanham, Md. 20706.

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April 11-14, Philadelphia — **National Micrographics Association 32nd Annual Conference and Exposition.** Contact: NMA, 8719 Colesville Road, Silver Spring, Md. 20910.

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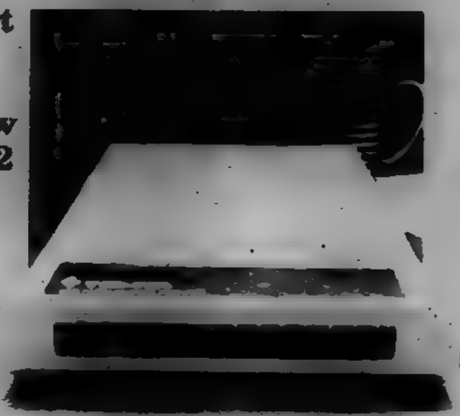

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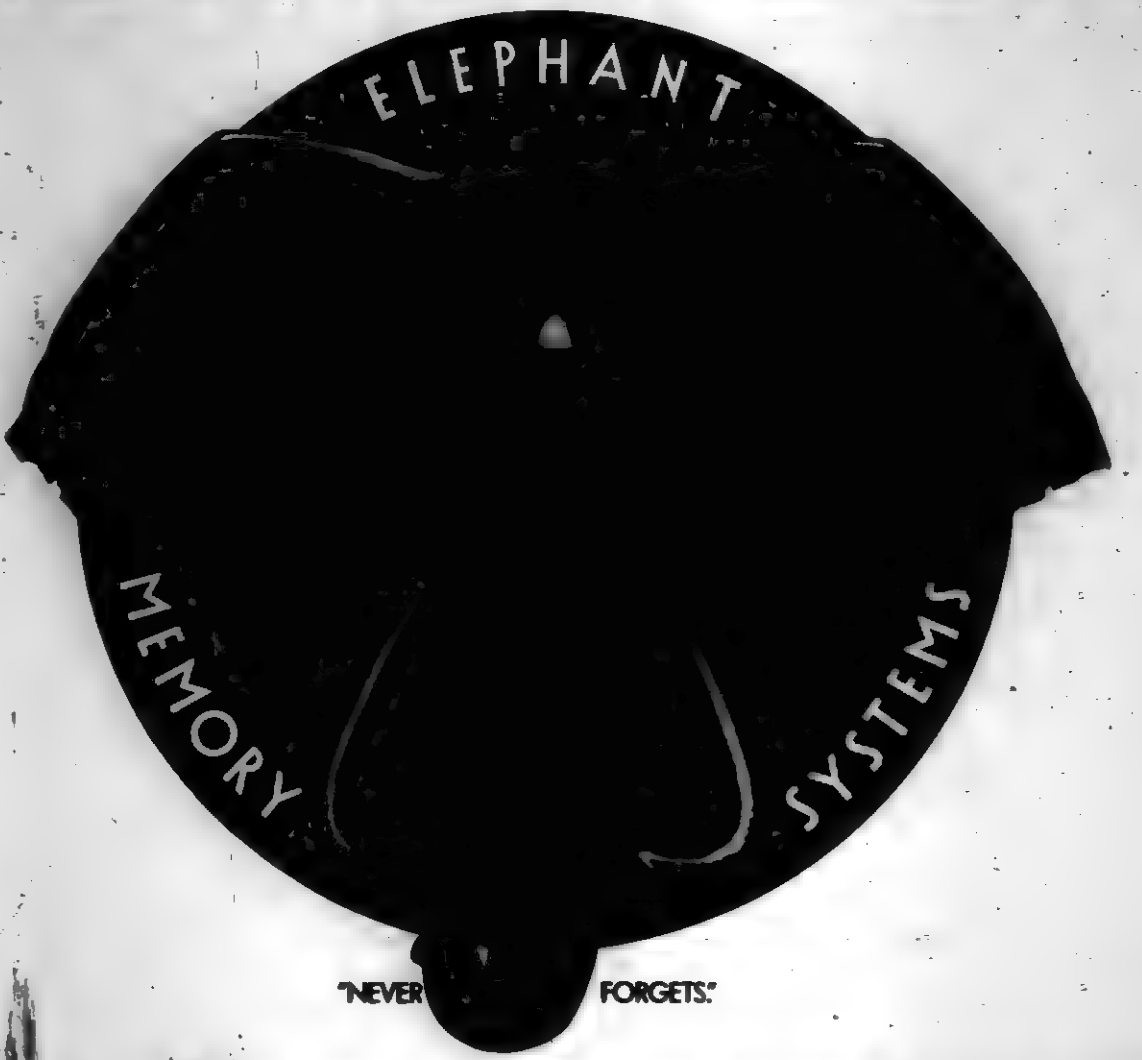

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Forecasters' Accuracy Depends Upon the Subject

By Bruce Hoard
CW Staff

Just how accurate are the predictions made by assorted computer industry gurus that appear in the pages of *Computerworld* and other trade publications?

Sometimes they're a bit optimistic, sometimes they're a bit conservative, and sometimes they're entirely off the mark. Sometimes they're even right. It all depends on the subject of the prediction.

Take microcomputers, for example:

- Venture Development Corp. prophesied in 1977 that "purchases of computers and related products for home use will increase at an average 37.2% annual rate in the 1976-81 period" [CW, Feb. 28, 1977]. By 1981, the VDC analysts added, the market would grow to "about" $178.7 million.

How close did those numbers come to reality? They were "pretty low," said David Terrie, senior analyst/office automation for International Data Corp. in Framingham, Mass. Terrie claimed that the 1981 market share for home micros was closer to $500 mil-

(Continued on Page 6)

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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NEWSPAPER

Revised Cobol-80 Standard Still Sparking Controversy

By Paul Gillin
CW Staff

HARTFORD, Conn. — Compatibility issues continue to dominate the controversy swirling around the revised Cobol-80 standard, which will be resubmitted by the American National Standards Institute X3J4 subcommittee for public review this year.

At a panel convened here recently to discuss the most recent revision of the proposed standard, industry representatives, who are also Data Processing Management Association and Ansi committee members, argued that they are not convinced that the benefits of conversion justify the cost.

The issue is of particular concern to DP shops with large numbers of program modules written in Cobol [illegible] and Cobol 74, panelists said. Critics of the revised standard, which has been under continuous development, review and revision by an Ansi subcommittee for nearly three years, contend that too many of the revisions are cursory and that conversion would demand large blocks of programming time simply to conform to a standard.

They also note that vendors are still uncommitted to

(Continued on Page 12)

SPECIALREPORT

Inside — Applications Packages: Software in the Fast Lane

Fight Under Way to Save Federal Standards Program

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — A Reagan administration decision to all but eliminate the federal government's computer standards program is encountering strong opposition from segments of Congress, the scientific community and the DP industry.

Under the fiscal 1984 budget proposal submitted by the White House a few weeks ago, the Institute for Computer Sciences and Technology of the National Bureau of Standards would suffer a 70% reduction; its funding would be cut from $10 million to $3 million.

ICST is charged by federal statute with developing federal computer standards and assisting government agencies in their DP use. In addition, ICST conducts computer science research and development and participates in national and international standards organizations.

According to the new budget plan, the remaining $3 million in funds would allow ICST to continue its research in local-area networks and monitor developments in national and international standards committees.

The rationale for dropping the standards program from the NBS budget, according to NBS Director Dr. Ernest Ambler, is that standards should be the province of the private sector. Under the Reagan plan, the ICST would monitor and assist private efforts in standards development and adopt their products to federal use where appropriate.

But during a hearing on this matter before a Senate science subcommittee last Tuesday, Ambler admitted that the government had not consulted private-sector organizations to see if they would fill the void left by ICST withdrawal from the standards process. NBS would try to push these organizations to become more active, he said.

Subcommittee member Sen. Frank R. Lautenberg (R-N.J.), a former DP industry executive, said he was "bewildered" by what he called the "pitiful" ICST budget proposal, particularly in light of the importance of the computer industry to U.S. economic health and given concerted foreign government efforts to support their own high technology

(Continued on Page 4)

HP, DG Sign Pacts With PBX Makers

By Bruce Hoard
CW Staff

Coverage of OAC '83 continues on Pages 14 through 16.

PHILADELPHIA — Corporate compatibility vied with new products for the limelight at the Office Automation Conference here last week.

On the corporate side, Hewlett-Packard Co. and Data General Corp. continued the recent trend of computer processing hardware vendors joining forces with communications companies. HP announced agreements with digital private branch exchange manufacturers Northern Telecom, Inc., Rolm Corp. and Intecom, Inc. that will link HP 3000s to all models of their respective PBXs, the SL-1, CBX and IBX.

HP is considering similar pacts with other digital PBX vendors, according to Andre O. Schwager, general manager of HP's Information Networks Division. Immediate compatibility is available with the SL-1 and CBX. Intecom's IBX will be compatible within two or three months, Schwager said.

Data General Corp. revealed that it and Northern Telecom will develop an advanced capability for connecting DG's Comprehensive Electronic Office system workstations with the SL-1. Under the agreement, the companies will enhance

(Continued on Page 14)

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England: Bill Dunlop, Stephen Thomas, [illegible] Assoc., 345 [illegible] Rd., Islington, London EC1V [illegible] Phone [illegible]

W. Germany: Eckhard Utpadel, CW Publikationen, [illegible] 11, 8000 Munich 40 Phone (089) 36-40-61 Telex 5215350

France: Patrick [illegible], Le Monde Informatique, 42, Avenue Montaigne 75008 Paris. Phone 720 85 40.

Japan: Mr. Shoho Kondo, Computerworld Japan, 1-10-7 Shintomi Chuo-ku, Tokyo 104 Phone (03) 551-3082. Telex 252-4217. Esteban H. Yamada, Tokyo Representative Corp., Yamaguchi Bldg., 2-12 Kanda Jimbo-Cho, Chiyoda-ku, Tokyo 101. Phone (03) 230-41178. Telex J26860

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Mexico: Richard Small, Computerworld de Mexico, [illegible] 21-2 Colonia Roma, Mexico City 7 D.F. Phone (905) 514-4218 (905) 514-6309

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Denmark: Preben Engell, Computerworld/Danmark, Gammel Strand 40, 1202 Copenhagen K. Phone 01-1226-11 Telex 27560 cwdan

Sweden: Bengt Marcstedt, Computerworld/Sweden, Norra Media AB, Vattenayen 35, 11420 Stockholm

Italy: Donato Cordova, Gruppo Editoriale Jackson, s.r.l., Via Rosellini 12, 20124 Milano

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Cary Steps Down From Post As Chairman of IBM Board

ARMONK, N.Y. — Frank T. Cary last week resigned as IBM's chairman after 10 years in that office. John R. Opel, who will continue as IBM's chief executive officer, will replace Cary as chairman.

Opel will be succeeded as president of IBM by John F. Akers, former senior vice-president and group executive of the Information Systems and Communications Group. Akers was also appointed to membership in the IBM corporate office, the body that provides overall direction to the company, IBM said.

Cary will not leave IBM altogether, but will remain a member of the corporate office and chairman of the executive committee of the board of directors.

In a prepared statement, Cary said, "We have a great management team in place, very capably led by John Opel . . . This is the right time for me to hand over to John the added responsibilities of chairman of the board."

Commenting on Cary's decade-long leadership, Opel said, "Frank Cary set the IBM company on course for today's successes and tomorrow's opportunities."

Cary joined IBM 35 years ago as a marketing representative and held various management positions before being named general manager of the Data Processing Group and vice-president in 1966. He joined the corporate office in 1969, and was elected president in 1971 and chairman and CEO in 1973.

Frank T. Cary

Newly elected president Akers joined the company 23 years ago as a sales trainee in the San Francisco office and was appointed vice-president in 1973 following various marketing assignments. In 1976 he was named assistant group executive of the former Data Processing Product Group, responsible for worldwide development and U.S. manufacture of IBM's large and intermediate systems, high-performance storage systems, communications products and terminals. He was later named group executive of the Information Systems and Communications Group.

In a related announcement, Paul J. Rizzo, a member of the board of directors, was elected vice-chairman of the board. A member of the corporate office and Corporate Management Committee, Rizzo joined the company 25 years ago. He became vice-president of corporate finance and planning in 1970 and senior vice-president in 1979.

SBS Asks FCC To Let It Market Jointly With IBM

WASHINGTON, D.C. — IBM and Satellite Business Systems (SBS) should no longer be barred from joint marketing activities, an SBS senior vice-president recently told the Federal Communications Commission (FCC).

The market is now far more competitive than it was in 1975, when SBS — a joint venture of IBM, Communications Satellite Corp. (Comsat) and Aetna Life and Casualty — received its common carrier license from the FCC, SBS' William D. English said in a letter to FCC Chairman Mark S. Fowler.

When SBS received its license, the FCC insisted on separate marketing activities because of fears that Comsat would gain a competitive advantage in selling to the IBM customer base by, for example, bundling IBM product and Comsat service offerings.

"There are now a host of domestic satellite system operators, as well as other communications vendors," English pointed out to Fowler. "Under Computer II [the FCC's Second Computer Inquiry Decision], the commission has deregulated customer premise equipment and data processing products and services, as well as enhanced services. The Modified Final Judgment in the AT&T case opens the whole area of unregulated activities to AT&T."

Aside from being unfair to SBS, the restrictions "constrain users' competitive choices by inhibiting SBS and IBM from responding to user requirements with the same freedom as other parties," English added.

This Week

SPECIAL REPORT ON APPLICATIONS PACKAGES .... Follows ID/18

IN DEPTH

Tax Breaks on Software .... Follows Page 50
Information Systems Engineering ID/9

NEWS

Factory Approach: New Way to Build Software 4
Insurer Fires 41 DPers Without Warning 5
Prime Users Irked by Users Group Policy 6
Pact Would Restrict Data Flow in Europe 7
New Job Links DP, Personnel Management 8
EEC Determined to Pursue IBM Antitrust Case 9
Critics Wary of BOC-AT&T Relationship 10
Adapso Prods Greene to Alter AT&T Judgment 11
Programs Link Compass With IBM CPUs, VAX 13
Exec Defines Role of Info Resource Manager 14
DEC Leads Off OAC Software Product Debuts 15
Wang Chief Sees Today's Micros Obsolete by '90 16
In-House Systems Vital to Banks: Speakers 17
Managers on the Move 18
Turnaround Time 19

EDITORIAL

Editorial: A 'Big Stick' Policy? 22
Softline: Fake Apples in Hong Kong 23
Human Connection: Training DPers 23

SOFTWARE & SERVICES

Intel Buys Tool to Speed DBMS Testing 25
On-Line Tool Announced 26
Method/1 Project Manager Gets Upgrades 30
'Bankpak' Runs on DEC VAX-11 32
JCL Generator Gets Support, Enhancements 33
Report Writer Enhanced 37
Implementation of Mumps Out 38
Quality Assurance Packages Out for HP 1000 39
HP Pricing Program Debuts 42

COMMUNICATIONS

Scott Systems Offers Intelligent Terminal Line 45
Field Test System Debuts 46
Local Net Capability Featured With Intecom 48

SYSTEMS & PERIPHERALS

SEL Introduces Line of 32-Bit Minis 51
3M Adds Rigid Disk Module to Micrapoint II 55
Storage Line Released by 3R 56
Power Distribution System Out 57

OFFICE AUTOMATION

NYC Pleased With WP System Evolution 59
Gemini System Gets File Searcher 62

COMPUTER INDUSTRY

Perkin-Elmer in Pursuit of OS Experts 65
IBM's Program Restrictions Get Mixed Reviews 65
Court Upholds IBM-Transamerica Decision 66
CSC Goes to Trial May 16 on Bribery Charges 68
ATS' Founder Lee Practices What He Dreamed 70
DEC Retail Outlets Renamed 72
Futurist Paints Bleak Picture 73
World DP Markets Seen Spiraling Toward PTTs 78

ADVERTISING INDEX 106

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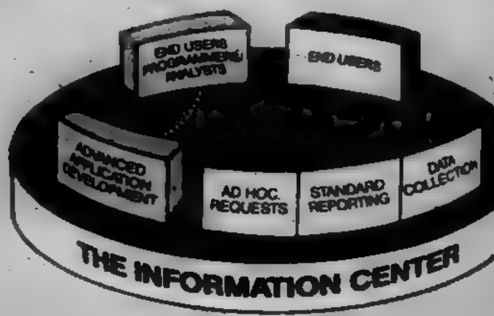

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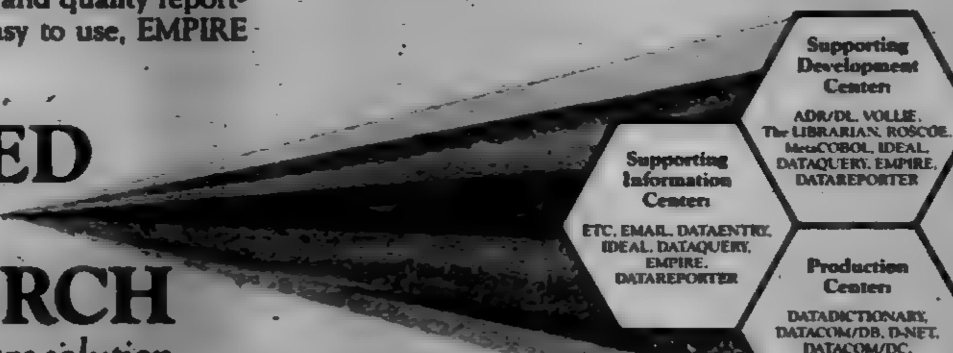
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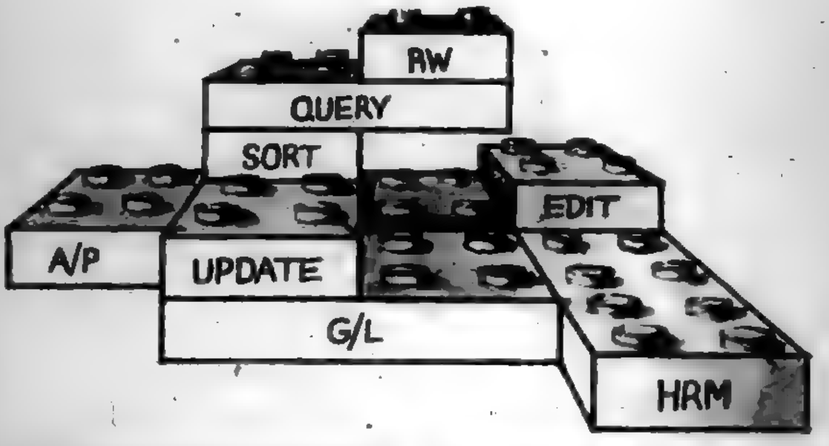
The one vendor system software solution

Factory Approach: New Way to Build Software

By Lois Paul
CW Staff

Just when you thought it was safe either to buy packages or develop your own software using structured methodologies, someone has come up with a middle course.

This chapter in the continuing saga of make vs. buy is called the component approach or the software factory technique. It involves reusable modules of code that handle the functions needed in most applications, such as update and edit routines. Users ideally select these modules at random, fitting them together into a package that best fits their needs.



Proponents of the reusable software concept liken its anticipated effect on applications development to the changes wrought by the industrial revolution. Several proponents contacted by *Computerworld* pointed to Henry Ford's introduction of standardized components and economies of scale to the manufacture of automobiles.

Merle Parks, product-manager for Cincom Systems, Inc.'s Mantis, compared it to gun manufacturing. "Originally, there were gunsmiths who created everything and every part was different. That was the way we were writing programs," he said.

Over time, the gunsmiths accumulated some of the same parts; similarly, in DP, software developers began using subroutines. "Then when we got to the point when the structured revolution came around, we said, 'Let's get structured subroutine libraries out there that everyone will use,' " Parks said.

Several companies are already working on implementations of the component approach to software development. Raytheon Computer Services of Wellesley, Mass., brought out Readycode, intended to give Cobol programmers access to reusable development tools [CW, Nov. 2, 1981]. "What Readycode is providing is really an architecture, not just reusable modules and reusable code," Larry Martin, the firm's general manager, explained. "Instead of developing 4,000 to 6,000 modules, you end up with a single architecture and 60 modules."

Developing Readycode

In developing Readycode, Raytheon analyzed a number of programs and found they all fell into some combination of the following categories — edit, update, report or extract. What resulted, therefore, was a finite number of models; Readycode provides a reusable logic structure based on these models.

According to Martin, the logic structure is about 60% of the code. The reusable modules portion of it averages 20% to 25%. Unique code, which deals with data elements and so forth, is only 15% to 20%.

Another firm working on the reusable component concept is McCormack & Dodge Corp. Its Advanced Financial Systems (AFS) design methodology "is really an application of reusable code, and the code that underlies AFS can be used in any kind of system," according to John Landry, vice-president of research and development for the Needham Heights, Mass., firm.

Landry's R&D group, which develops financial software packages, recognized that portions of the software they were writing performed the same functions. What was needed was a means of defining data independent of the code so the functions could be defined generically. They developed reusable pieces of code at the lowest level of data manipulation, which Landry called the "normalizer," to handle data I/O.

"One of the functions of the normalizer is that you can have a date in any known format and it will figure out if that is a valid date," Landry said. "Programmers go to great lengths to make a fancy algorithm to edit dates and it already has been done a thousand times."

Parks and others contacted by CW referred to the Department of Defense-sponsored Ada language development effort as related to the eventual proliferation of the component method of development software. "Ada has a strong concept of separating the description of what something does from the implementation of how it does it," explained Chris Braun, director of quality assurance for Softech, Inc. of Waltham, Mass. By doing this, a software developer can look at the specification part and be able to tell whether it can be used in a different place.

It Could Change Management's Perception

By Lois Paul
CW Staff

Changes in the way corporate management perceives software may result when DP shops begin building software systems from reusable modules.

American businesses generally consider software a corporate expense rather than a corporate asset because they tend to throw their packages away and buy new ones every five to seven years, when their businesses change, observed Larry Martin, general manager of Raytheon Computer Services. If companies take advantage of reusable software modules, he believes they will have to change only the 15% to 20% of the code that is application-specific. The remaining 60% to 75% can be considered a corporate asset which has continuing value.

However, to use the reusable component technique, management philosophy regarding software development also must undergo a change. The message will have to come from above that packages are to be developed in such a way that they can be easily reused.

Some resistance within the DP staff to reusable modules of code involves the perception that they already are doing this and it will not fulfill their specific needs. Once users get past the "not invented here" syndrome, Martin said, they will recognize that the reusable module approach ends many of the mundane tasks and frees programmers to do more systems analysis.

Robert Jepson, vice-president of Custom Software, Inc. in Irvine, Calif., said that if this concept catches on, other advantages for users will be quicker development of systems and the availability of more reliable software.

"The negative side is that they would be somewhat restrictive because standard software would only do 'n' things and the user always wants something else," Jepson said.

Although he is "optimistic" about the reusable software concept, Dr. Stephen Crocker, principal director of The Aerospace Corp. in El Segundo, Calif., said there still are problems with this approach which he hopes will be ironed out. The first is that functional specifications have to be clear and modular enough to be reused. This relates directly to the development of standards for modules, he explained.

Potential Problem

The other potential problem, according to Crocker, is efficiency and performance of reusable modules. His feeling is that general-purpose modules tend to be less efficient than specific versions tailored to the application.

"My hope would be that we would have tools that would be smart enough to do that tailoring on the fly as part of the factory process," Crocker said, referring to the possible application of artificial intelligence techniques.

"I am hoping that there will be powerful enough approaches, rather than 'a hope and a prayer' approach applied to make it work," Crocker said.

Fight Under Way to Save Standards-Making Body

(Continued from Page 1)

industries. Noting the rapidly increasing American defense budget and increases in other government R&D support programs, Lautenberg asked of the ICST budget, "Is this the only place we're going to [reduce] the deficit?"

More Critical

Other hearing participants were even more critical of the ICST budget. Dr. Mildred Dresselhaus of MIT, who chairs the National Academy of Sciences' NBS evaluation panels, called the ICST budget cut "particularly devastating and imprudent."

Dresselhaus noted the important role ICST plays in the International Standards Organization. She said the federal government must remain active in standards development because the government, as a large computer user, must be represented and because ICST participation amounts to representation for "the weaker elements of the public sector."

Jack Biddle, Computer and Communications Industry Association president and a longtime advocate of government participation in standards development, told the Senate subcommittee that the ICST budget is being cut because it has been too successful.

Biddle blamed the cuts on lobbying by large DP vendors who, he charged, are afraid an open standards process will eliminate their position as de facto standards setters — a position they hold, he said, by virtue of their large market share.

Biddle also pointed to government estimates that the federal standards program has saved the federal government millions of dollars in procurement costs by increasing competition. "Ten million dollars per year to procure and utilize more intelligently $20 billion a year worth of [government] goods and services seems to be an extremely small price to pay," according to Biddle.

Federal government concerns aside, Lautenberg suggested that reducing ICST standards activities means "relinquishing a substantial part of our responsibility" to the economic future of the country. "We ought to extend the [ICST] operation and be funding it more agressively," he said.

Dresselhaus added, "When one person's widget doesn't meet with another person's widget, it's the consumer that has the problem with the interface, and that's where the bureau can be very helpful."

Cites Finances, Not Performance

Insurer Fires 41 DPers Without Warning

By Jeffry Beeler
CW West Coast Bureau

SAN RAFAEL, Calif. — Systems specialists have become the latest targets of a major insurance company's continued effort to rid itself of what it apparently regards as unnecessary employees.

In a Feb. 9 move that reportedly caught its victims by surprise, Fireman's Fund Insurance Co. summarily trimmed 41 programmers, analysts and other workers from its approximately 770-member central computing staff.

On the morning of their dismissal, each of the 41 employees was suddenly approached by his or her superior and given 10 minutes' notice to appear in one of several company conference rooms. There, in groups of approximately 10, the workers were handed packets of information outlining the firm's employee benefits and were informed of their employer's decision to dismiss them immediately, according to one of the casualties, programmer Keith Hayenga.

While the employees were in the meetings, Fireman's Fund was eliminating the workers' system identification numbers and was changing its IBM TSO access codes, according to a second ex-staffer, who asked not to be identified.

Differing Opinions

Opinions differ widely over exactly what the recent personnel cutbacks mean. Hayenga and the other ex-staffer characterized the dismissals as "layoffs" and held out hope that some of the workers might ultimately be rehired.

However, the company's senior vice-president of systems, Jerry Sommerhauser, disputed the employees' interpretation of the action and described the cutbacks as "firings" that are unlikely to be reversed anytime soon.

Opinions also diverge widely over the question of what prompted the personnel dismissals in the first place. Hayenga spoke of the cutbacks as an economizing move aimed at "freezing" the company's DP budget.

Sommerhauser, however, attributed the dismissals partly to the current economic slowdown, which has produced a 50% dip in the firm's typical systems department turnover rate. He further blamed the staff cuts on a sudden dropoff in the company's internal requirements for new automated services. "We've just finished several large application development projects, and we suddenly found ourselves with more people than we have work to do," he said.

Although the staff cutbacks left no part of the Fireman's Fund systems organization unscathed, some groups clearly suffered more casualties than others. By far the hardest hit employees were the application programmers, according to the ex-staffer who asked not to be identified. Only about two people lost their jobs in the company's system programming section, with an equal number dismissed from its technical writing and advanced technology departments.

Some of the now-unemployed system staffers had worked at Fireman's Fund for nearly 25 years, according to Hayenga, himself a nine-year veteran of the company.

Similar Reduction

The Feb. 9 dismissals came only about two months after a similar staff reduction that cost approximately 180 nonsystems people their jobs in the firm's nearby life insurance subsidiary, Hayenga said.

Part of the reason the cutbacks came as such a shock to the firm's employees is that Fireman's Fund has earned a reputation over the years for going to great lengths to avoid letting its people go, Hayenga said. Another reason the dismissals took their victims by surprise is that Fireman's Fund has only recently completed one of its most profitable quarters on record — hardly a telltale sign of an impending staff cutback, Hayenga added.

Although the staff cuts for the most part were conducted amicably, at least one of the dismissed employees objected to the company's decision to announce the cutbacks without notice. "We were given absolutely no opportunity ahead of time to transfer to other positions within the company or to seek work at another employer," according to the ex-Fireman's Fund systems employee who requested anonymity.

Security Group Forms

LOS ANGELES — The Information Systems Security Association has been formed here to promote the exchange of information related to information systems security.

Meetings of the nonprofit group will be held in Los Angeles.

Annual dues are $30. More information can be obtained from Information Systems Security Assocation, P.O. Box 71926, Los Angeles, Calif. 90071.

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Prime Users Irked by Users Group Policy

By Susan Blakeney
CW Staff

BOSTON — People were grumbling at a recent Eastern Region Prime User Group (PUG) meeting here. But they weren't criticizing Prime Computer, Inc.'s product line. Instead, they were dissatisfied with their users group.

Many Prime users feel that a variety of vendors, even those that compete with Prime, should be allowed to exhibit their wares at PUG gatherings. But Prime's corporate policy forbids such participation, noted a PUG official who asked to remain anonymous.

"Third-party hardware vendors drove Prime crazy at the New Orleans meeting," the official said. Prime was "so appalled someone else was there selling memory and peripherals.

"Prime's new president, Joe Henson, was aghast at the fact that there were competitive vendors there. He established a new policy: Prime will attend only if vendors stay home."

Users Holding Ground

However, when the time grew near for its recent regional meeting in Boston, the users were still holding their ground, and Prime's official policy softened, the PUG source reported. "They said they'd go only if noncompetitive vendors were allowed," such as Prime-compatible software firms, as opposed to vendors of memory, disk drives and various related hardware peripherals.

Thus, Prime was on hand for the meeting and concurrent exhibition, as were some 26 noncompetitive sellers of primarily application software.

However, at a meeting on the second day of the conference, "the users almost unanimously voted to allow all vendors at the next regional meeting," slated to take place in February 1984 in Baltimore, according to the PUG spokesman.

"We feel that Prime will probably never offer specialty software, so it's only fitting that we be able to see it from other vendors." In addition, the PUG official contended that Prime's pricing structure is inequitable, alluding to Control Data Corp.'s disk drives, which are incorporated in Prime systems and sold at twice the CDC price.

"Third-party people help keep prices down," agreed Michael Causer, vice-president of CIS, Inc. and a veteran Prime equipment user.

"It's against Prime's best interest to have this policy," added another Prime user, Jim Requa, vice-president of Exeye Software Tools, Inc. "The more activity that occurs around their machines, the more interesting their products become," he reasoned.

"In other words, every vendor that sells products to be used with Prime computers is also pushing Prime computers," Requa said.

At the same meeting, users voted on the same issue regarding an upcoming national PUG meeting, scheduled for June in San Francisco. "There was a mixed consensus on this," recalled Hal Borns of Phoenix Systems in Lexington, Mass., who was named to the newly created post of secretary-treasurer. "Many people felt that private vendors should limit their exhibitions to the regional meetings."

Lynn Ladd, Prime's manager of public relations, said Henson's corporate policy preventing competing vendors from attending user meetings now pertains only to the national PUG meetings.

As for the next Eastern regional meeting at which users are insisting on inviting any and all vendors, Prime is sticking to its policy at this point.

"That's what they're saying, but I cannot envision that happening," commented Ray Grande, the regional PUG president.

Should Prime Fund PUG?

By Susan Blakeney
CW Staff

If Prime Computer, Inc. directly funded the Prime User Group (PUG), its policy excluding competitive vendors from group meetings might be understandable. However, this apparently is not the case.

At a recent PUG meeting in Boston, one PUG official took issue with Prime's lack of financial support for its users group.

"Prime says it supports its users group because it has provided some staff and equipment at these meetings ... but that's not financial support.

"They said they spent $160,000 for our national meeting. That's less than the cost of one Prime 750 machine," the source, who requested anonymity, noted. Digital Equipment Corp. and Hewlett-Packard Co. finance their respective users groups, and the PUG spokesman feels Prime should do the same.

On the other hand, some members of the users group think Prime should keep its money and leave the policy making to the users group.

"I'd like to see the users group completely funding itself and maybe staffed by one full-time person acting as a center for communication ... and maybe a biannual newsletter," said Jim Requa of Exeye Software Tools, Inc. PUG currently operates with no paid staff, no newsletter and no membership dues, he added.

"I think the value of a users group is threefold," Requa continued. "Its goal is to provide communication between users, communication between users and Prime and communication between users and other vendors.

"The users group should be completely independent of Prime in order for the second point to be effective," he maintained.

Michael Causer, a Prime user from CIS, Inc., agreed with Requa on the issue of Prime not funding the users group. "Funding is not critical. If there were no strings attached it [funding] would be fine.

"If they said, 'You damn well better do as we say' then you'd have to tell them where to get off."

In terms of providing staff and equipment at the meetings and refusing to let competitive vendors attend the same show, Causer likened the situation to charitable donations: "I don't expect to govern WGBH's [Boston's public television network] programming just because I donate $50 to them."

Lynn Ladd, manager of public relations at Prime, said the relationship between Prime and the users group "has not been clearly defined yet."

Eastern PUG Elects Officers

BOSTON — Ray Grande was elected president of the Eastern Region Prime User Group (PUG) during its recent annual meeting here. Grande is administrator of computer-aided design and manufacturing at Raytheon Data Systems Co. in Norwood, Mass.

Also elected were Judy Peters of ARA Government Services, Inc. of Baltimore, who was named vice-president; and Hal Borns of Phoenix Services in Lexington, Mass., who was named to the newly created post of secretary-treasurer.

PUG's upcoming national meeting will be held in San Francisco June 19-23. Further details are available from Dr. Willima Lenharth at the University of New Hampshire, Pettee Brook Offices, Durham, N.H. 03824.

Predictions' Accuracy Depends on Subject

(Continued from Page 1)

lion and that during 1980 and 1981 the market grew at least 100% per annum.

However, Terrie was quick to point out the liabilities of looking into the future six years ago. He noted how few major micro vendors existed then and pointed to what he called "a complete software drought."

Dale Kredatus, manager of consulting services with Datapro Research Corp., called the VDC numbers for the home computer market "optimistic." The first computer kits came out at that time, generating widespread belief that the home computer boom was on. As it turned out, the new computers were too complex for popular use, he said.

Kredatus called the $178.7 million projection for 1981 low, suggesting $300 million was closer.

- Creative Strategies, Inc. (CSI), another firm that makes market forecasts, claimed in 1978 that by 1982, the personal computer market would grow to $3.5 billion and the portion of that market reflecting small business purchases would top $1 billion [CW, June 12, 1978].

Terrie was impressed. "That was pretty good for the time [CSI] did it," he commented, noting corresponding IDC figures of $3.8 billion and "over" $2 billion. "Everybody thought that the home market would be much bigger than it has been and the business market would be much smaller."

Next week, in Part 2 of '20/20 Hindsight,' a look at whether the predictions about a programmer shortfall were on target.

But Kredatus disagreed with the CSI predictions. "That was a little overoptimistic," he said, declaring that today's micro market is approximately $1.4 billion or $1.5 billion. Kredatus pointed out the impact that IBM is having on the market; it expects to ship $895 million worth of its Personal Computers by the end of this year.

How Did Predictions Fare?

How did predictions for the telecommunications market fare? Consider:

- VDC predicted in 1978 that the raster scan display market would grow 60% per year [CW, Dec. 11, 1978]. Both Terrie and Kredatus agreed with that rosy prediction, saying it was close to the mark.
- But both experts disagreed with a 1978 prediction from International Resource Development, Inc. (IRD) that the overall telecommunications service and equipment market would grow 4% annually, reaching $88 billion in 1988. IRD said at the time that market segments able to compete with the Bell system would grow at much faster rates — 10% to 100% annually.

Terrie said the current growth rate is 10% to 20% and growing. And Kredatus called 4% conservative. He said "that sounds very good" of the higher growth rates for Bell system competitors.

- IRD claimed in 1978 that IBM would diversify into telecommunications more than any other area over the next 10 years [CW, March 27, 1978]. "I can't really say that that's true," Terrie stated. "It seems fairly clear that where [IBM is] diversifying is in the small systems and in terms of distribution channels as well."

But Kredatus thought IRD's telecommunications forecast was correct. He also agreed with an IRD claim stating IBM would feel mounting pressure to broaden its market base to include personal computers, consumer electronics and microprocessor-based control instrumentation.

- One last example of a notable prediction during the recent past emanated from Michael Killen, president of Strategic, Inc. In the Nov. 23, 1981 issue of *Computerworld*, Killen was quoted as saying that Xerox Corp.'s Ethernet local-area network would be a total failure within two years. "Xerox is headed for the worst failure in the company's history," Killen proclaimed.

Terrie took sharp exception to Killen's prediction, calling it one of the "worst" and "most irresponsible" he had ever heard. Kredatus agreed, saying Killen's claims were "not fair" and "misguided."

Threatens U.S. Firms' Operations Abroad

Pact Would Restrict Data Flow in Europe

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — U.S. corporations, struggling for years to ensure relatively free international data flows in the face of growing European data privacy laws and regulations, are now eyeing warily a new threat to their overseas operations, a soon-to-be-ratified European treaty that could greatly restrict data transfers to the U.S.

At issue is the Council of Europe (COE) convention for protecting automated personal information. Approved in late 1980, the treaty will have the force of law once ratified by its members. It will go into effect after five COE nations, of which there are now two dozen European countries, have signed it, which is expected sometime this summer.

The convention, although recognizing the value of "freedom of information regardless of frontiers," states that a signatory may restrict data transfers outside its territory to nations that do not have data protections equivalent to the originating country. The document sets out basic principles for data quality, security and record-gathering fairness and calls for a centralized enforcement body of member-state representatives.

U.S. Objections

The U.S. government has consistently objected to the treaty's rather rigid guidelines and enforcement mechanisms and has sought to emphasize instead the voluntary privacy guidelines developed by the Organization for Economic Cooperation and Development (OECD), of which the U.S. is a member.

Those guidelines have been endorsed by the U.S. government and by almost 200 American corporations. It had been hoped here that these endorsements, along with the existing body of U.S. privacy laws, would persuade European nations not to close down transatlantic data flows. The outlook for such a conclusion to the data flow debate has become increasingly clouded of late with the advancement of the COE treaty, especially when that development is coupled with other indications of possible data flow restrictions.

One such indication is the nearing completion of a British privacy law, which was drafted with the COE treaty obligations in mind and which apparently looks toward imposing data flow restrictions on nations — such as the U.S. — which are not COE members and do not have the kind of omnibus privacy statute now common to Western Europe.

Although representatives of European nations have indicated during the last few years that it is unlikely all data flows to the U.S. would be cut off by the treaty, the absence of guarantees is troubling to U.S. DP and service firms, which rely to an extent on free data flow.

For example, Hugh Donaghue, Control Data Corp. vice-president and chairman of a State Department private-sector transborder data flow advisory group, said recently that COE treaty ratification could make the OECD guidelines "a meaningless document." When the treaty becomes law for European nations, the U.S., as a nonsignatory, could find itself "in the position of being something of a second-class citizen," he said.

Responding to that at a recent meeting of the State Department advisory panel, Kenneth Leeson, of the National Telecommunications and Information Administration, noted that the OECD guidelines are voluntary and do not legally bind endorsers to their principles and acknowledged to Donaghue that there is "a real possibility" COE countries will not recognize endorsement of the guidelines as sufficient proof of adequate privacy protection practices.

One State Department official suggested the U.S. could work out bilateral agreements with COE nations to ensure continued two-way data flows, but he added such negotiations take a lot of time and that the government has taken no action in that direction.

Noting the growing private-sector concern about the COE treaty, Donaghue suggested it might be disastrous to continue the present course, which he characterized as "we wait [until the treaty takes effect] and then say, 'Oh, my God! What do we do now?' "

Correction

In "BAI Plans Bank DP Auditing Certification" [CW, Feb. 14], it was reported that the EDP Auditors Association offers a Certificate in Information Systems Auditing. The certificate is actually titled Certified Information Systems Auditor. In addition, John Van Borssum is the associate chairman of the organization's annual conference, not the organization's associate chairman.

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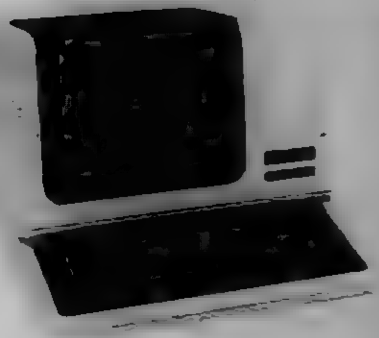
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New Job Links DP, Personnel Management

By Marguerite Zientara
CW Staff

There's a new job in town and it combines two volatile and rapidly changing areas of interest — computers and personnel management.

The job is manager of human resource information systems. It reportedly exists in nearly 80% of all major U.S. corporations with over 5,000 employees.

The job involves "managing all the data an organization requires to utilize effectively and pay its people," explained Edward Goldmacher, president of the San Mateo, Calif.-based Association of Human Resource Systems Professionals. According to a recent salary survey done by the association, the typical manager of human resource information systems is in his middle to late 30s; is as likely to be female as male; is as likely to be a DP expert as a personnel expert (with a trend toward personnel); and earns $38,000 to $42,000 a year.

Those who hold the job — which is expected to be pervasive by the year 2000 — must be able to maintain, extract and present data in usable form to corporate decision makers. They are in charge of "very sensitive information regarding affirmative action plans, Equal Employment Opportunity, employment of the handicapped and so on," Goldmacher said.

Besides developing an integrated information system to handle human resource needs, the manager serves as a "liaison between data processing technical-type specialists and human resource management people, so we can communicate with both groups in order to get a system like this in place," explained Catherine Roberts, manager of human resource information systems for Northwest Bancorporation in Minneapolis.

Once developed, the human resource information system calls for "constant enhancement because we're working in a very dynamic, changing environment in human resources today, which is not the way it was 10 or 15 years ago," Roberts said. Human resource information systems managers must be able to respond to changes in compensation programs, government reporting needs and internal program changes. One of the biggest areas of concentration today is flexible benefit programs, "where employees can select from a core of benefits and choose additional ones within a certain realm of dollars," she explained. "You can't put a system like that in place unless you have a good computerized package to support it, or you'd never keep track of what everybody has selected, how much that's costing and the impact on the whole benefits program for the whole company."

Another key responsibility is education of senior management and other people in the company about the system's capabilities. "If it just sits out there and isn't used for the full capabilities that it has, then maybe the company's not getting the best value for its dollar," Roberts stressed.

Many holders of the job, "particularly up until three or four years ago, were strictly DP-oriented," Goldmacher pointed out, "but we're now seeing a tremendous shift toward the functional user, toward the personnel professional."

Why? Small computers are becoming user-friendly enough to "be plopped right down in the personnel organization and put to work," and there is a wide acceptance of packaged software products available that require minimal DP support, according to Goldmacher. In addition, "we're rapidly hitting the point where the two lines cross — where software is cheaper than people and it doesn't pay to put a lot of resources into developing a human resource system because you can buy one at relatively cheap prices."

Finally, there is a shift in responsibility. "It used to be that anything that had to do with computers came under the realm of the DP department, which quickly locked itself behind a key-coded door," Goldmacher pointed out. "We are now, thanks to the advent of microprocessors, dispersing this information out, tearing apart the empires built by the DP people and laying more responsibility for the systems at the feet of the user."

Three Managers, Three Backgrounds

One has a background in personnel. One has a background in engineering and DP. The third has worked in both disciplines.

That's what *Computerworld* found when it interviewed three managers of human resource information systems last week.

Catherine Roberts of Northwest Bancorporation in Minneapolis is the manager with the background in personnel. "My feeling is that the background should be in human resources simply because if you don't understand what the needs are of the group who's going to use an information system, how can you put one in place?

"DP people have to come around and learn what the needs are of that group before they can be effective in a user area," she added.

"On the other hand," she conceded, "I had to pick up a lot of technical knowledge through the years that you don't gain overnight."

What does the future hold for Roberts? She could do consulting work, set up information systems in other companies or move into another area of human resources, such as a vice-president or director position — becoming "more of a generalist," she noted.

Sidney Simon, manager of personnel information systems and benefits administration for Bechtel Power Corp. in San Francisco, is "an engineer that grew up in data processing." Simon held a similar position in another company before coming to Bechtel seven years ago, "except I was on the DP side, and I report into personnel management now," the manager maintained.

How did Simon become familiar with the world of personnel? "I've been working with personnel payroll systems for probably 12 years, even though I was on the other side of the fence."

With a B.S. degree in industrial engineering and an M.S. in management science, Simon feels he has more options for his career path than others in his position might "because I'm technical and the company is technical."

Simon may expand into other areas of the company, such as commercial services or senior management administrative positions or into DP, he projected.

One human resource information systems manager based in Minneapolis has experience in programming and systems development; moreover, she has also worked in lower-level personnel research positions.

As the first holder — appointed 10 years ago — of her current responsibilities in a 35,000-employee company, she is "high enough up now that it is pretty hard to move" except laterally. Even then, "my background is so narrow in scope; it has centered around this area," the human resource information systems manager maintained.

Expressing her dissatisfaction with her company's DP department, however, she maintained, "Sometimes I feel I'd like to take over the place.

"What's happening is that I'm doing more and more of the data processing in my own department because the DP department as such is not answering my needs."

Immigration Bill Reintroduced With National ID System Intact

WASHINGTON, D.C. — Congressional sponsors of immigration law reform legislation — a bill that died last year amid considerable controversy over possible discrimination against Hispanics and over its national worker identification mandate — have reintroduced the bill in the new Congress.

Sen. Alan K. Simpson (R-Wyo.) and Rep. Romano L. Mazzoli (D-Ky.) resubmitted their Immigration Reform and Control Act Feb. 17.

The bill was approved overwhelmingly by the Senate last August, but widespread debate on the measure in the House of Representatives' Judiciary Committee delayed the matter in the House until the end of the 97th Congress last December [CW, Jan. 24].

The bill is controversial on several counts, not the least of which is its provision to penalize employers who knowingly hire illegal aliens. To enforce this provision, the bill directs the president to develop a secure worker identification system to be checked by employers.

Civil liberties groups argue that the proposed documents, possibly backed by a centralized government computer system, would be in effect a national ID system, a concept long rejected by Congress.

The bill's supporters cite the legislation's prohibition against using the ID system for purposes other than employment, but opponents of the plan, including high-ranking administration officials, argue that the temptation to use the system for other purposes, such as tracking down draft resisters, would be irresistible to government agencies.

Initial hearings on the bill were scheduled for Simpson's Immigration Subcommittee Feb. 24-25.

In Face of U.S. Pressure to Drop It

EEC Determined to Pursue IBM Antitrust Case

By Robert Batt
CW West Coast Bureau

BRUSSELS, Belgium — Pressure from the U.S. government to drop its antitrust complaint against IBM has made the European Commission more determined than ever to pursue its case, a spokesman for the commission said here recently. In fact, he said, there is a "grim determination" to see the case through to its conclusion.

Pointing to IBM's market aggressiveness since the dismissal of the U.S. vs. IBM antitrust case, the spokesman, an official of the European Commission's industry section, said, "In the last year, IBM has been acting as if it doesn't have anything to worry about. It is perfectly clear that the [European Economic Community] commission is the [final] antitrust body capable of taking action with regard to IBM practices, and this has strengthened our determination to get justice."

IBM argued its case before the European Commission, the civil service arm of the 10-nation European Economic Community [EEC], at a special hearing held a year ago. It tried with written and verbal evidence to dispel the notion that it dominates the market for large users, locking them into IBM products and essentially forcing them to migrate from one generation of products to another without competition.

IBM Testimony

To back up its arguments, IBM presented testimony and statements from U.S. government officials, including former Secretaries of State Alexander Haig and Cyrus Vance. Vance, a member of the IBM board of directors, told the commission that EEC sanctions against IBM could lead to the U.S. government imposing sanctions against European companies operating in the U.S.

"In the past, the United States has been criticized in Europe for an overzealous application of its antitrust laws to foreign corporations. Today, the trend is in the other direction," Vance said. "I must tell you frankly, however, that the commission's proposed action [against IBM] could bring a decided change in that trend."

Such comments seem to have had an impact opposite to their intended effect. Soon after the hearings, Frans Andriessen, the member of the European Commission with responsibility for competition policy, said that the EEC intends to pursue the case against IBM further, even if it takes years. Since then, the European Commission has been busy preparing a "Statement of Objection" updating what it considers to be IBM's malpractices and drawing up a list of proposed remedies.

"The way in which the U.S. government dropped its case against IBM and its public intervention in the European case on IBM's behalf has effectively ensured that there is no possibility of the commission dropping its case," the European Commission spokesman explained. "The U.S. government acted with incredible clumsiness. The pressure on the commission has become so widely known that even if we wanted to give the case up, we couldn't. The whole exercise by IBM and the U.S. government has been utterly counterproductive."

EEC Treaty

IBM is accused of having committed several infringements of Article 86 of the European Economic Community Treaty. If IBM is found guilty, the commission could fine it up to 10% of the revenues accumulated in the year preceding the conclusion of the case. Based on the current revenues of IBM subsidiaries in the EEC, this means the U.S. manufacturer could be fined more than $600 million.

The European Commission has basically accused IBM of two abuses. First, the commission charges, IBM has adopted a marketing policy of "bundling" certain products, particularly CPU main memory and basic software; the commission wants users to be given separate purchase options.

Secondly, when introducing product changes and additions, the industry giant refuses to disclose details of any interface change until at least after first customer shipment, if at all, according to the commission. The commission wants IBM to release interface details prior to first customer shipments in such a way that they are public knowledge and so that competitors do not have to indulge in reverse engineering.

No deadline has yet been set for completing the Statement of Objections. When it is finalized, the commission will send it to IBM, which will then be given the opportunity for another hearing before the commission, most likely out of the public spotlight.

The commission will then make its decision. If the decision goes against IBM, the case will almost certainly be propelled into court soon after it is handed down.

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Critics Wary of BOC-AT&T Relationship

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Running through most of the computer industry comments filed recently on AT&T's divestiture plan is the contention that AT&T's special relationship with the Bell operating companies will continue after divestiture. The chief means of maintaining it, according to the critics, is a "central staff organization," which the seven regional holding companies are required to set up so that the U.S. Department of Defense and federal civil emergency agencies can have a single point of contact with the national telecommunications system.

The agreement settling the U.S. vs. AT&T antitrust case also says that the central organization "may" provide other functions. Critics contend, however, that AT&T's reorganization plan assigns a whole raft of functions — for example, service planning, net control, upgrading of network interfaces and transmission quality and research/engineering of Bell operating companies' product requirements — to the central staff organization. The critics also point to AT&T's admission that 75% of the central organization's personnel will be former AT&T employees.

Perhaps the most signifiant critique of the central staff organization came from the Federal Communications Commission, which also filed a comment on the plan: "There is a concern . . . that the 'technical evaluation' function performed by the central staff for the [Bell operating companies] may result in the de facto promotion of Western Electric products . . . since the [Bell operating companies] are barred from the manufacture of telecommunications products . . . the argument may be made that . . . vendors in the marketplace will be a sufficient source for the research necessary to produce this equipment."

IDCMA Warns of AT&T's Power Over Divested Operating Companies

WASHINGTON, D.C. — One of the parties that contended AT&T's proposed divestiture plan gives AT&T too much power over the divested Bell operating companies is the Independent Data Communications Manufacturers Association (IDCMA), which represents major modem makers.

The IDCMA cited provisions of the plan that would leave the divested Bell operating companies "excessively dependent upon AT&T in the areas of software, patents and technical information."

IDCMA is also concerned about disclosure of technical information to competitors. "We simply can't compete unless we receive adequate and timely information about the telephone network," the association said.

Work on Their Own

ITT said the divested Bell operating companies should evaluate, select and purchase products on their own rather than through a proposed central staff organization.

IDCMA argued that, despite statements to the contrary, AT&T will participate in the deliberations of this central staff organization because two of the organization's members will be the Cincinnati Bell and Southern New England telephone companies, neither of which is to be divested.

Moreover, "the plan contains no assurance that data communications network providers will have the same type and quality of access as that provided to interexchange voice carriers," GTE Corp. said.

Access to Records

In addition, "AT&T is to have access to some of the most fundamental computerized Bell operating company customer information records, and through them could obtain ready access to . . . prospective customers for future AT&T marketing purposes, thereby obtaining an unfair competitive advantage," GTE said.

Greene should order AT&T to compensate the Bell operating companies for any investment tax benefits it obtains as a result of the reorganization, said the North American Telephone Association (Nata), an interconnect manufacturers trade group.

Nata wants installed terminal equipment transferred to AT&T at net book value rather than the lower "adjusted net book value" favored by the phone company.

The Computer & Communications Industry Association told Greene the Bell operating companies must be required to market terminal equipment through separate subsidiaries to prevent them from cross-subsidizing those offerings with revenue from their monopoly telephone service and imposing an unfair burden on the ratepayer.

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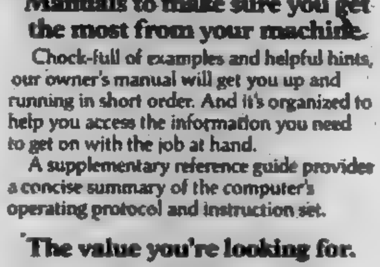

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Adapso Prods Greene to Alter AT&T Judgment

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Long-distance data communications users may get better service from AT&T than from its competitors unless the telephone company's proposed divestiture plan is changed, the Association of Data Processing Service Organizations, Inc. (Adapso) contended earlier this month.

Adapso was one of several interested parties that told U.S. District Court Judge Harold H. Greene what they think of the divestiture plan that AT&T devised recently to carry out the antitrust settlement it negotiated with the U.S. Justice Department last year. Greene presided at the trial and is overseeing implementation of the agreement.

AT&T and the Justice Department will have a chance to respond to the comments filed this month. Replies to AT&T and Justice comments are due April 10 from the parties that filed earlier this month.

Greene will then decide whether to accept, reject or modify the phone company's plan. It is not known how long he will take to make that decision.

Adapso Arguments

In the comments it filed with Greene, Adapso argued that although the settlement agreement — officially known as the Modified Final Judgment — requires all of the 22 to-be-divested Bell operating companies to provide equal "information access" as well as equal "exchange access," AT&T's plan talks almost exclusively about the latter. AT&T will share many switching facilities with the operating companies, Adapso said, pointing out that the phone company also will retain exclusive ownership of the software that runs the Stored Program Control switches now being installed in the network.

Adapso's key point was that this arrangement would enable customers of AT&T's unregulated subsidiary, American Bell, Inc., to obtain better service from AT&T's Long Lines Division than customers using the services of competing suppliers.

This problem "is by no means hypothetical," the association contended, referring to statements made by the Federal Communications Commission (FCC) last summer when it ruled on the application for what is now called Basic Packet Switching Service (BPSS). The application was rejected partly because American Bell planned to place the packetizing/depacketizing facilities for its projected Advanced Information Service/Net 1000 (AIS/Net 1000) service alongside Long Lines' BPSS switches. Because American Bell's competitors would not be allowed to do likewise, the FCC said this could mean that AIS/Net 1000 customers would not only pay lower rates, but also reap some technical advantages.

"Access to the total range of frequencies occupied by a particular intercity carrier system can be obtained from many central offices; this can be of particular value where high-speed data transmission over analog carrier facilities is required," the commission explained, adding that American Bell's competitors would need "special construction of local connecting facilities" to provide equivalent access to their customers.

"A similar question may arise if information access is provided by the [Bell operating companies] through facilities designed by and jointly used with AT&T," Adapso said this month in its comment on the divestiture plan. "The problem would be particularly acute . . . if the [operating companies] are not given control of the software used in their switching facilities."

Cbema's Concerns

The Computer and Business Equipment Manufacturers Association (Cbema), after pointing out that its members "are substantial users of AT&T and [Bell operating company] communications facilities," said that as users they are concerned about two aspects of the divestiture plan: the possibility that local exchange access charges may be hiked to cover revenue shortfalls stemming from the divestiture, which would raise rates to end users; and the plan's alleged failure to identify clearly who will own certain backbone communications links.

On the first point, Cbema referred to the affidavits given to Greene by the chief executive officers of the seven regional holding companies created by the divestiture plan. In these affidavits, the officers promised that their companies would be financially viable after being separated from AT&T. Cbema is worried about these affidavits because several were predicated on an assumption that local regulatory bodies would raise access charges to cover divestiture-induced revenue shortfalls.

On the second point, Cbema noted that the divestiture plan allows AT&T to own circuit links totally within an operating company's territory, officially known as a Local Access and Transport Area (Lata), if those circuits "perform inter-Lata functions." The capacity of these links would then be leased to the operating companies.

This scheme leaves end users uncertain about how such facilities will be priced and who will service them, Cbema indicated.

HP-75 SPECIFICATIONS
Size and weight: 10" X 5" X 1¼", 26 oz
48K-byte, ROM-based operating system:
• 8-bit CMOS CPU • Multiple file structure in continuous memory • Instruction set: 52 system commands, 43 BASIC commands, 41 numeric functions, 7 string functions, 6 time-mode commands, 16 arithmetic/logical/relational operators
Numeric precision:
• Real—12 digits ($\pm 9.99999999999 \times 10^{\pm 499}$)
• Short—5 digits ($\pm 9.9999 \times 10^{\pm 99}$)
• Integer—5 digits (± 99999)
Time/appointments:
• Perpetual clock/calendar • 12- or 24-hour format • Appointment control of command/program execution
Memory:
• User (RAM)—16K bytes, expandable to 24K bytes • Operating system (ROM)—48K bytes
• Plug-in software (ROM)—up to 96K bytes (3 32K-byte modules)
Typewriter-like QWERTY keyboard:
• 65 keys • 194 redefinable key combinations
• "Hidden" numeric keypad
Integral mass storage: hand-pulled card reader (1.3K bytes per card)
Built-in interface: HP-IL; choice of 15 peripherals
Power supply: 3 AA NiCad batteries (AC adapter/charger included)
Liquid-crystal display: 32-character window on 96-character line

Compatibility at Issue in Cobol-80 Controversy

(Continued from Page 1)

providing full conversion support, a fact that makes the standard more of a risk than they are willing to take.

"If I have to give heartburn to a compiler writer or a consumer, I'll give it to the compiler writer," said Art Dubnow, chairman of the DPMA's standards committee. Dubnow estimated that recoding accounts for only about 10% of the cost of converting and he recommended that the benefits of Cobol-80 be "fractured, so that the benefits are optional when compiled."

But figures will bear out the worth of converting to the new standard, countered Jerome Garfunkel, president of Jerome Garfunkel Associates, Inc., a training consultancy firm and a member of the X3J4 and X3 Codasyl committees.

Garfunkel, the panel's lone conversion advocate, said a forthcoming document from the National Bureau of Standards will show that the cost benefits of converting to the new standard outweigh the drawbacks by about six to one. The report will be available in late spring from the National Bureau of Standards, Room A265, Building 225, Washington, D.C. 20234.

Garfunkel also maintained that the compatibility issue will ease if vendors provide assurance to customers that conversion aids will be available. "X3J4 ought to legislate that," he said.

The DPMA recently withdrew its strident objections to the proposed standard [CW, Jan. 10], indicating that Cobol-80 deserved another look. And opposition from the panel to the proposed changes was noticeably absent — a reflection, panelists said, of extensive revisions made by the X3J4 committee after more than 2,200 negative responses were received during initial public review last spring. None of the panelists questioned that the revised standard is clearly an improvement over Cobol 74. How much of an improvement was the point of contention.

Garfunkel ardently restated the theme that time is of the essence in adopting a standard. "The world is getting smaller and [systems] will need to talk to each other a lot better. Standards make that happen," he maintained.

"All the controversy about compatibility foreshadows the fact that Cobol-80 has a lot of neat stuff that makes it more productive and easier to use," he claimed. "I don't want to [downplay] incompatibility, but I don't want to confuse it with the clear definition given to things that were undefined before."

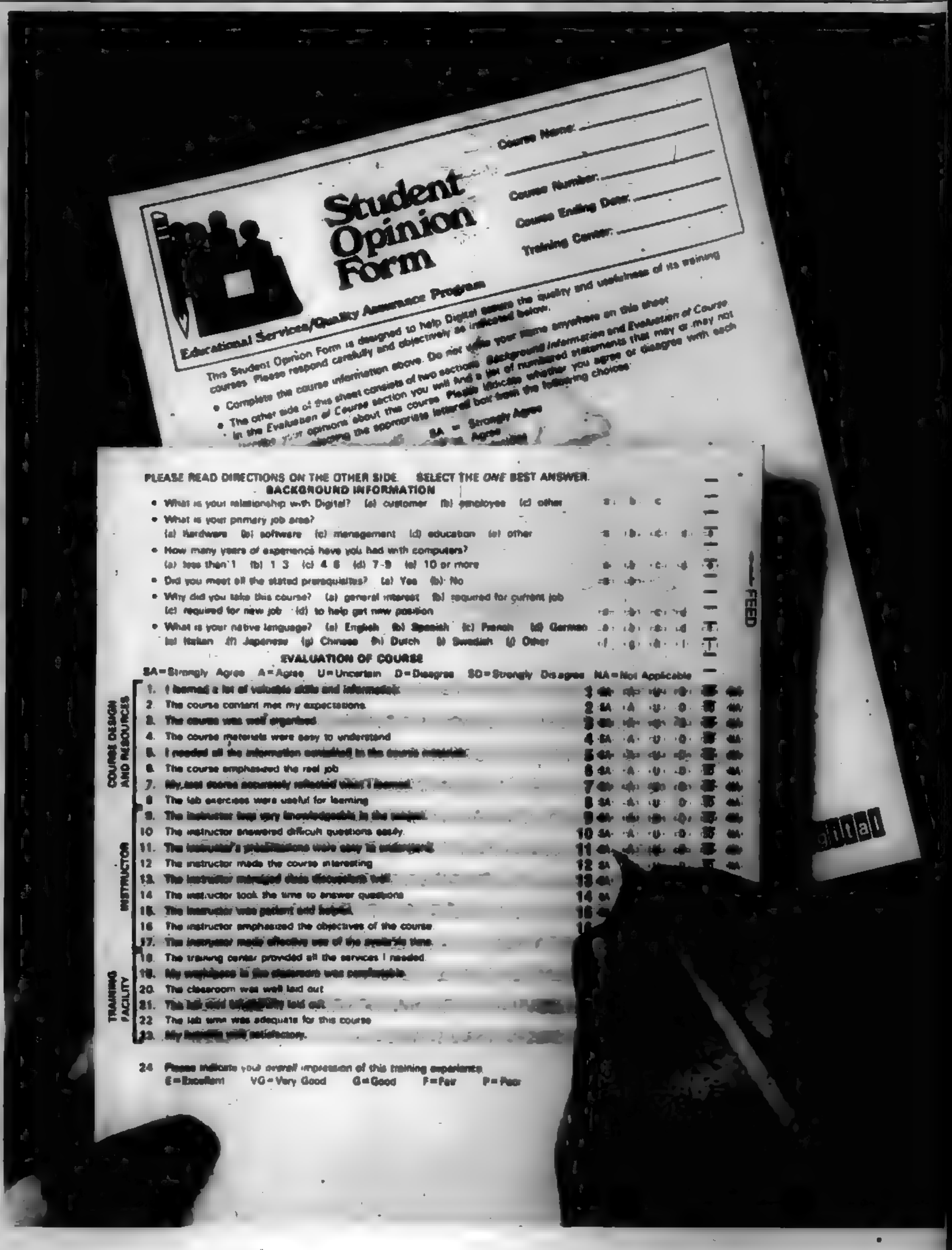
The panel was moderated by Lemuel Skidmore of New England Data Services, also an X3J4 committee member.

Changes Cited In Cobol-80

HARTFORD, Conn. — The proposed Cobol-80 standard developed by the American National Standards Institute X3J4 subcommittee contains major structural improvements, said Jerome Garfunkel, president of Jerome Garfunkel Associates, Inc., a training consultancy firm, and a member of the X3J4 and X3 Codasyl committees.

Speaking at a panel discussion of the new standard proposal held here recently, Garfunkel pointed to some specific changes that he said clean up ambiguities and eliminate obsolete code:

- Some 20 conditional statements have scope terminators attached to them.
- A new EVALUATE verb can apply to multiple variables at once in any mix.
- The new version nests programs inside each other, making global data available to internal programs and allowing the user to specify global declaratives.
- Data values within programs can be initialized by adding simple statements.
- CALL statements have been changed to add a feature that allows the user to pass data between programs for manipulation with or without altering the original values.
- DO WHILE and DO UNTIL variations of the PERFORM verb have been incorporated to allow testing before or after execution.
- Subscript limits have been extended to a minimum of seven levels.
- FILLER has been made an optional word that now can be specified at the group level.
- A de-editing feature has been added, allowing a numeric edited data item (for example, TIC CZ) to be moved into purely a numeric data item (for example, TIC 99).
- A symbolic character clause allows programmers to define a character and equate it with Ascii characters that previously were nonprintable.
- A WITH DUPLICATES clause has been added to the SORT verb to ensure the input sequence of duplicate keys will be returned to the output file in sequence.
- The INSPECT statement has a new CONVERTING clause option that offers a shorthand mechanism for doing multiple replacements of characters.



Student Opinion Form

Educational Services/Quality Assurance Program

Course Name: __________

Course Number: __________

Course Ending Date: __________

Training Center: __________

This Student Opinion Form is designed to help Digital assure the quality and usefulness of its training courses. Please respond carefully and objectively as indicated below.

- Complete the course information above. Do not write your name anywhere on this sheet.
- The other side of this sheet consists of two sections: Background Information and Evaluation of Course.
- In the Evaluation of Course section you will find a list of numbered statements that may or may not [illegible] your opinions about this course. Please indicate whether you agree or disagree with each [illegible] the appropriate lettered box from the following choices:

SA = Strongly Agree

[illegible] Agree

PLEASE READ DIRECTIONS ON THE OTHER SIDE. SELECT THE *ONE* BEST ANSWER.

BACKGROUND INFORMATION

- What is your relationship with Digital? (a) customer (b) employee (c) other
- What is your primary job area?
  (a) hardware (b) software (c) management (d) education (e) other
- How many years of experience have you had with computers?
  (a) less than 1 (b) 1-3 (c) 4-6 (d) 7-9 (e) 10 or more
- Did you meet all the stated prerequisites? (a) Yes (b) No
- Why did you take this course? (a) general interest (b) required for current job
  (c) required for new job (d) to help get new position
- What is your native language? (a) English (b) Spanish (c) French (d) German
  (e) Italian (f) Japanese (g) Chinese (h) Dutch (i) Swedish (j) Other

EVALUATION OF COURSE

SA = Strongly Agree A = Agree U = Uncertain D = Disagree SD = Strongly Disagree NA = Not Applicable

COURSE DESIGN AND RESOURCES

1. I learned a lot of valuable skills and information.
2. The course content met my expectations.
3. The course was well organized.
4. The course materials were easy to understand.
5. I needed all the information contained in the course materials.
6. The course emphasized the real job.
7. My test scores accurately reflected what I learned.
8. The lab exercises were useful for learning.

INSTRUCTOR

9. The instructor was very knowledgeable in the subject.
10. The instructor answered difficult questions easily.
11. The instructor's presentations were easy to understand.
12. The instructor made the course interesting.
13. The instructor managed class discussions well.
14. The instructor took the time to answer questions.
15. The instructor was patient and helpful.
16. The instructor emphasized the objectives of the course.
17. The instructor made effective use of the available time.

TRAINING FACILITY

18. The training center provided all the services I needed.
19. My workplace in the classroom was comfortable.
20. The classroom was well laid out.
21. The lab was [illegible] laid out.
22. The lab time was adequate for this course.
23. My [illegible] with satisfaction.

24. Please indicate your overall impression of this training experience.
E = Excellent VG = Very Good G = Good F = Fair P = Poor

Martin and Bell Labs Director To Speak at Federal Expo

WASHINGTON, D.C. — James Martin, author of more than 25 books on computer/communications technology, will be the featured speaker at the Federal Office Systems Expo (Fose '83), to be held here March 14-17.

The keynote address will be delivered by Joseph Laferrera Jr., executive director of Bell Laboratories. Laferrera will address "The Manager in the Information Age: Participant or Spectator?"

Other sessions at the conference include a discussion of local-area networks by Neal Dempsey, vice-president of marketing at Harris Corp.; "Beyond Word Processing: Office Systems Integration," by Dr. Jay Kunin of Hammer & Co.; "The Professional as a User of the Office System," by Peter Brunner of the U.S. Department of Labor and Leland Russell of Eiger Corp.; and "Alternate Worksites," by Richard Harkness, senior strategic planner at Satellite Business Systems.

The registration fee for the full conference is $250, according to a spokesman.

More information is available from the show's sponsor, National Trade Productions, Inc., which is located at 9418 Annapolis Road, Lanham, Md. 20706.

Grid Systems Introduces Programs to Link Compass With IBM CPUs, DEC VAX

By Ed Scannell
CW Staff

MOUNTAIN VIEW, Calif. — Grid Systems Corp. has introduced terminal emulation programs that allow its Compass portable computer to communicate interactively with programs running on IBM's 370, 30 series and 3080 series mainframes as well as all Digital Equipment Corp. VAX-11 superminis.

The Grid3101 program reportedly turns Compass into either a 3101 or 3270 portable terminal that permits either character- or block-mode communications with IBM mainframes. GridVT100 software permits the Grid computer to access and retrieve data from the DEC superminis by emulating the DEC VT100 terminal.

Besides the emulation packages Grid made three other announcements including:

- Its support of IBM's MS-DOS operating system for the Compass Computer.
- Two Compass-compatible local disk storage devices: the M2101, a combination 5¼-in. Winchester and floppy diskette drive; and the M2103, a portable 5¼-in. floppy diskette drive.
- And Gridprint, a document formatting software package that enables Compass users to format documents more easily to be printed on the vendor's dot matrix printer.

In addition to emulating the IBM and DEC terminals, Compass users reportedly can also configure the emulation programs to emulate any other nonintelligent asynchronous terminal, giving the system access to private and public data bases as well as remote computer systems.

According to Grid President David Hanna the emulation programs supply solutions to two different management needs. "The first [solution] is for the end-user manager who needs a management workstation capability and wants a system that links to the mainframe or minicomputer.

"The second [solution] is for the [management information systems] director or data processing manager of any large organization who faces a proliferation of incompatible 8-bit and 16-bit systems that can't be linked or interleaved into the corporation's large computer systems and data bases," he explained.

Supporting the Grid3101 emulator is Gridreformat, which reformats data retrieved from a host file and sends it to a Compass file. In doing this, the reformatted data is then compatible with other Grid management application packages.

Other IBM mainframe data and capabilities Compass users can access through the packages include:

- IMS and CICS applications and files for processing and data manipulation.
- Development systems such as VM/370 or TSO/SPF for text processing, file manipulation, job submission and program development.
- Access to time-sharing systems including The Source, Dow Jones and Compuserve.

The Grid3101 and the GridVT100 emulation packages cost $200 each. Gridreformat, which supports Grid3101, sells for $100.

The one-time cost for the MS-DOS operating system is $150. Prices for the disk drives are $4,100 for the M2101 combination hard/floppy disk drive and $1,195 for the M2103 portable floppy disk drive. Gridprint costs $75.

More information can be obtained from 2535 Garcia Ave., Mountain View, Calif. 94043.

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digital

Execs Define Role of Info Resource Manager

CW At OAC '83

By Jim Bartimo
CW Staff

PHILADELPHIA — "Is information resource management more than just a buzzword?"

Posed by Verne Morland, strategic planner for NCR Corp., that question was answered by a handful of experts who also defined the role of the information resource manager at the Office Automation Conference (OAC '83) held here last week by the American Federation of Information Processing Societies, Inc.

The information resource manager's role is basically to manage the ways and means by which end users can access company data, said Alexia Martin, management systems consultant at SRI International, Inc. But, she noted, this means the information resource manager must oversee business system methodologies, information requirements, data dictionary and information center.

He will also research present and future corporate information requirements, serve as the repository of corporate information and create policy guidelines and procedures appropriate to the support of company goals and objectives.

The long-term goal of the information resource manager is to support better management decision making, reduce the cost of information acquisition and allow the company to share resources, Martin said.

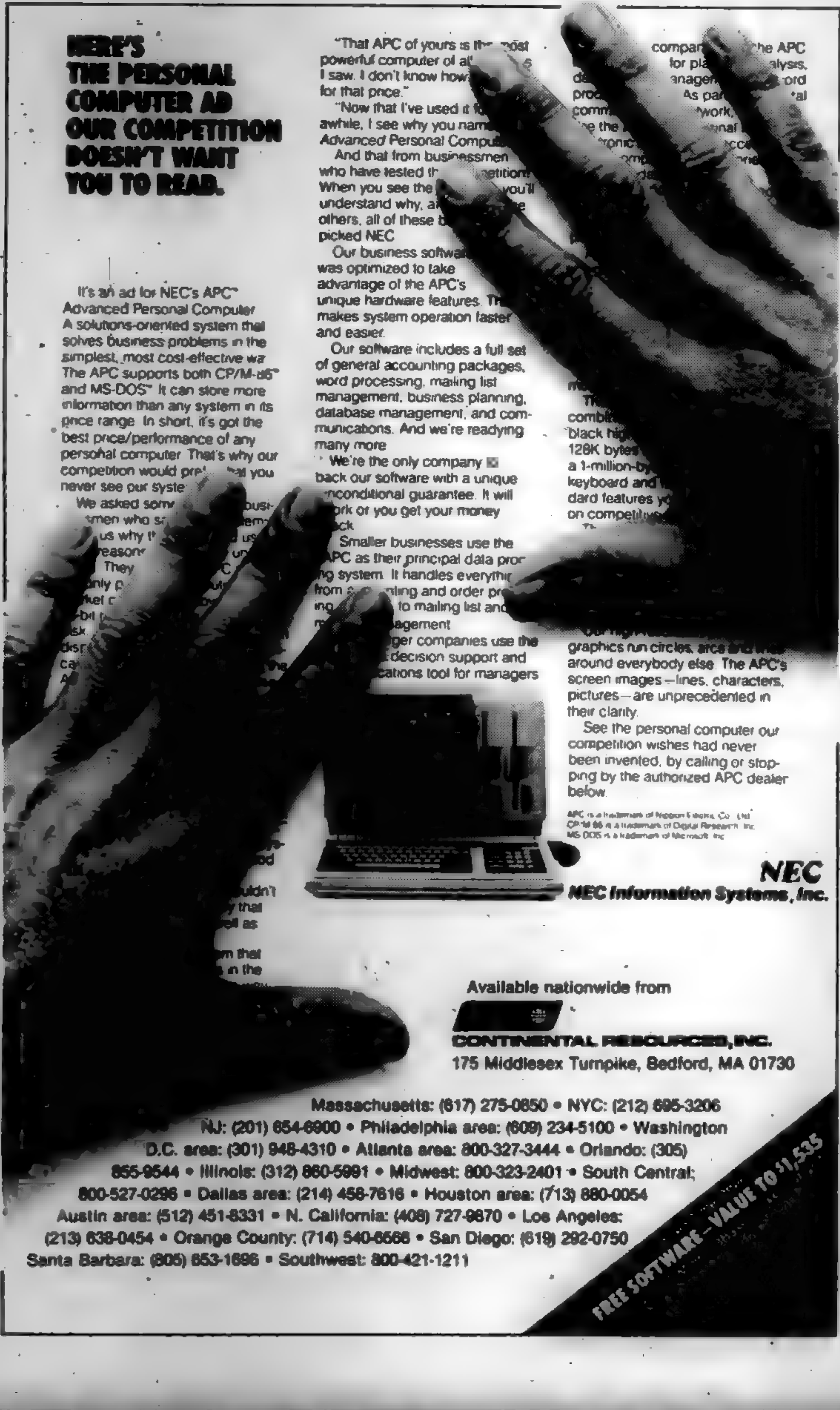
As an information resource manager, Morland applied these points to the example of personal computers. "Personal computers are being bought now and thought about later," Morland said. "Managers have not taken a managerial role because they have been intimidated by the technology."

The information resource manager is better equipped to deal with this type of problem because he is familiar with the technology, Morland said.

But the information resource manager will encounter some problems as he tries to restrict certain means of data access. "The restructuring of information will meet with the same reception as the restructuring of the budget," Morland said. "The information resource manager will be viewed as a power broker and an empire builder because whoever controls the distribution of information controls the distribution of power."

This problem can be circumvented by pointing out to users that information, unlike another source of power — money — can be used by more than one person and can be used differently by different people, Morland said. "The information resource manager is really only concerned with data about data, not the data itself," he added, pointing out that a data dictionary only tells the user where the data resides, not what the data means.

Tom Elder, systems development manager for Frito Lay, has a staff of six providing technical information to his company for the past year. The resource center provides application consulting, education and other assistance, Elder said.



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FREE SOFTWARE—VALUE TO $1,535

HP, DG Ink PBX Agreements

(Continued from Page 1)

their products to let Northern Telecom's Displayphone function as a workstation in a CEO office systems network. A date for actual compatibility will be set within the next two or three months, a spokesman said.

On the product side, Exxon Office Systems Corp. was a primary newsmaker when it announced its 8400 series of shared resource workstations and the Model 965 ink jet printer. The Unix-based 8400 system employs multiple 16-bit Zilog, Inc. Z8000 microprocessors and features three models ranging in storage capacity from 512K bytes of main memory and 14.5M bytes of hard disk storage to 2M bytes of main memory and 306M bytes of disk storage.

The 8400 series is built on the Exxon 500 series information processor. The Model 520 functions as the 8400 systems terminal; current 520 users need only a simple field upgrade to access the multiuser capabilities of the 8400. The 500 series models link to the 8400 controller via multidrop, twisted-pair wiring.

A three-workstation, one-printer system costs $27,500 from Exxon at 777 Long Ridge Road, Stamford, Conn. 06902.

Wang Laboratories, Inc. announced enhancements to its Digital Voice Exchange (DVX) voice store-and-forward system, including the DVX Option, which provides full voice capability when attached to a Wang OIS 145, and word processing capabilities on the DVX. It announced a message management system that allows anyone to deposit voice messages for DVX subscribers.

The DVX Option supports up to 250 users, will be available in May and costs $54,000. The DVX with word processing is available immediately in 12 different models ranging from $119,000 to $248,300.

DEC Leads Off OAC Software Product Debuts

PHILADELPHIA — Among the software products introduced at the Office Automation Conference (OAC '83) here last week was the All-in-One Graphics program, a menu-driven graphics package unveiled by Digital Equipment Corp. for its VAX-11 line of superminis.

All-in-One includes four separately priced products:

- VAX-11-Decgraph, a tool for generating charts and graphs needed for ad hoc decision-support-type reports. It carries a license fee of $3,500 and will be available in June.
- VAX-11-Decslide, designed to generate presentation graphics in the form of slides and transparencies that can include both graphics and text. Available in September, it is licensed for $3,500.
- Polygraphics, a product for creation of documents that can combine graphics and text on a page. It can be licensed for $6,000.
- Fingraph, a third-party product available from Fingraph Corp. through DEC's Classified Software program. DEC will be marketing the product, which is intended to provide more sophisticated management reports by converting large amounts of tabular data into graphics format and reports.

The license fee for Fingraph begins at $5,000, depending on the configuration. This fee does not include support, which is available through Fingraph Corp.

The All-in-One package is available with an optional "satisfaction guaranteed" program. Interested customers work with DEC representatives on a consulting basis to develop a customer support plan for the product.

If they are not satisfied with the product during the first four months after its installation, their hardware purchase price and software license fees will be refunded, a DEC spokesman explained.

DEC also announced at the show a version of its Dectype word processing system for the VAX-11 supermini. The VAX-11 version is licensed at $5,000. (The current PDP-11 version is licensed at $3,500.)

In addition, an agreement with Houghton Mifflin Co. was outlined regarding the upcoming availability of that firm's spelling correction and verification package for the VAX-11.

Further information on DEC's announcements can be obtained from the firm at 129 Parker St., Maynard, Mass. 01754.

CW
At OAC '83

In addition to working with Northern Telecom on interconnecting its Comprehensive Electronic Office (CEO) system workstations to the SL/1 (story on Page 1), Data General Corp. announced a software package that makes Wang Laboratories, Inc. word processing systems compatible with CEO systems. The CEO Document Exchange package allows documents received on either CEO or Wang systems to be edited, filed or mailed as if they were produced on that system.

The initial license fee for the package is $5,000. Subsequent licenses are $2,500. DG is located at 4400 Computer Drive, Westboro, Mass. 01580.

Also unveiled at the show was a new release of On-Line Software International, Inc.'s Omnicom electronic mail system. Omnicom Release 3 reportedly enables messages to be addressed with actual names rather than user identification numbers to make it easier for nontechnical employees to learn the system.

The enhanced system also offers the setup of private or company-wide distribution lists on-line. The vendor explained that the user itemizes the list and gives it a name. When sending a message to a group, the user addresses it to the distribution list name and the correspondence automatically is delivered to everyone on the list.

Compatible with any single CPU or multiple-CPU network running IBM's CICS, Omnicom is reportedly no longer dependent on a CICS sign-on. It now includes its own sign-on, which requires only mailbox name and password.

Pricing for Omnicom Release 3 begins at $25,000, the vendor said from On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

DPI Meet to Focus On Resource Use

OTTAWA — "Maximizing Resources in Times of Restraint" will be the theme of the Data Processing Institute's (DPI) Professional Development Week conference here March 15-17.

Topics to be addressed include corporate information strategy, office communications, information management, computer-assisted learning and software tools.

Running concurrently will be Interchange '83, an exhibition of DP systems from various Canadian government agencies, which will be free and open to the public.

For DPI members the conference will cost $40, for nonmembers $70 and for students $20. DPI can be reached through Box 2458, Station D, Ottawa, Ont., Canada K1P 5W6.

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Wang Chief Sees Today's Micros Obsolete by '90

By Bruce Hoard
CW Staff

CW
At OAC '83

PHILADELPHIA — Many of today's stand-alone microcomputers will be obsolete by 1990, the president of Wang Laboratories, Inc. said here last week at the Office Automation Conference (OAC '83), sponsored by the American Federation of Information Processing Societies, Inc. John Cunningham attributed the approaching obsolescence of stand-alone personal computers to a growing need for multifunction workstations by professional managers.

"The craze for [personal computers] has caused a bottom-up approach to their usage, rather than a top-down approach that would fit [personal computers] into larger business goals," Cunningham declared.

The low cost of personal computers has led many users to buy first and think later about how to use them, he added. While admitting personal computers offer benefits, he said the value of some of their applications is overrated.

Current stand-alone personal computers will be obsolete by 1990 because as more attention is given to the professional and the manager it will be recognized that they need a multifunction workstation more than a personal computer, he claimed. "In other words, users need a definite set of applications," Cunningham said. "As office automation gains ground with professionals and managers, many of today's stand-alone [personal computers] will turn out to be a shortsighted investment."

When implemented without proper planning, stand-alone personal computers end up with no resource sharing, communications or networking capabilities or upgradability to the "advanced functions that characterize office automation."

The continued growth of personal productivity systems for workers at all levels of the office may be endangered by unwise investments and lingering disappointments in today's personal computer, Cunningham said.

CW Photo by J. Bertino

John Cunningham

The multifunction workstation will supersede the stand-alone micro, he claimed. Eventually, professional, managerial and administrative and secretarial workstations will perform all the basic tasks for which they were acquired. Multifunction workstations will also be able to communicate, handle electronic mail, access internal and external data bases and do graphics and word processing, he declared.

Cunningham said office automation is a "five-year-old who has learned several important early lessons." Its growth could be stunted if technology is implemented with faulty expectations and if people close their minds to new ideas about productivity and cost justification, he added.

Cunningham warned against office automation cost justification based solely on quantifiable measures. He said it is the quality and effectiveness of a memo's content or the timing of a telephone call that are "ultimately" important.

"The true function of office automation is to enhance the performance of a cooperative office team by helping it to achieve the overall business goals of an organization," Cunningham commented.

Seminar to Cover Selling Software

TORRANCE, Calif. — The Education Foundation of the Data Processing Management Association (DPMA) is sponsoring a seminar on "Developing the Software Design and Technical Management Sections in the New Business Proposal." It will be given March 14-15 in Orlando, Fla.; March 17-18 in Washington, D.C.; and April 7-8 in Boston.

The seminar offers a plan for organizing software proposal teams, selling customers on your company's capabilities and demonstrating requirements understanding, translating requirements into design and managing the software development activity. The tools necessary for developing the winning software proposal will also be presented.

The registration fee is $445 for DPMA members and $475 for others. More information is available from DPMA Seminars, Department SPP, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510.

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Your Survival Depends On In-House Systems, Speakers Tell Bankers

By Jeffry Beeler
CW West Coast Bureau

PALM SPRINGS, Calif. — The very survival of large banks and other financial institutions will hinge, to a great extent, on their in-house systems departments and the applications those organizations create.

That observation was one of the main conclusions that emerged earlier this month during a two-day conference attended by 50 senior executives of financial institutions throughout the U.S. The conference was sponsored by Dallas-based Hogan Systems, Inc., a supplier of integrated application software for banks and related businesses.

Faced with the threat of unprecedented competition, financial institutions are finding themselves under increasing pressure to automate their tried and true methods of delivering customer services, IBM consultant Don Long said in an address delivered at the conference.

Most of those delivery mechanisms are cumbersome and woefully ill-equipped to compete in a world where electronic banking is fast becoming a way of financial life, Long pointed out.

The responsibility for improving the efficiency of bank customer services falls squarely on the shoulders of systems personnel, who are being called upon to develop much of the application software upon which electronic banking depends. So, like it or not, computing specialists within large financial institutions are rapidly assuming a newfound importance, Long said.

Caught Off Guard

This abrupt rise to prominence has probably caught most of the banking industry's DP staff members at least a little off guard.

Until recently, information systems departments and other bank back-office groups were regarded primarily as "garbage collectors," the entities that "clean up the messes" in their respective institutions, Long explained.

But today, for the first time, computing shops and other operations departments within large financial institutions are becoming directly involved in the creation and distribution of new customer services.

Long, who works primarily with large financial institutions, attributed the banking businesses' growing investment in automated services to increased competition, from both within and without the industry.

Part of the intensified competition is coming from brokerage houses, major retail store chains and other companies that banks never before regarded as serious rivals. These so-called "near banks" have recognized the banking industry as a major new business opportunity for the future and are rapidly repositioning themselves to take advantage of that opportunity.

Competition Among Banks

Competition is also growing quickly among the existing banks themselves — a fact Hogan Systems President Richard Streller ascribed to the banking industry's recent deregulation. In the wake of changes in federal banking rules, financial institutions can now pay whatever interest rate they choose for their depositors' checking accounts, Streller said in an interview during the conference.

Whatever the source of the banking community's increased competition, one fact remains beyond serious dispute: Financial institutions now need to improve the efficiency of the mechanisms through which they deliver their customer services, although automation should proceed slowly, Long said.

"Changes are necessary in the way banks make their services available to their customers, and the sooner those improvements come, the better," he warned. "Banks that neglect to make the required adjustments will find themselves falling behind their competitors and may even have a hard time staying in business," he said.

At present, the vehicles on which banks and other financial institutions rely to deliver services to their customers are outmoded and extremely inefficient, Long said. In 1980, for example, U.S. financial institutions processed 50 billion checks and other pieces of paper and spent $24 billion on labor. The "near banks," by contrast, boast a comparatively efficient service-delivery mechanism, although they are still unable to offer customers the same level of convenience as the more established institutions.

So for existing banks to keep pace with their new sources of outside competition, they "have to replace human tellers with electronic ones and install automated systems instead of paper-based services," Long said.

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Managers on the Move

S. ROBERT DiRAFFAELE has been appointed vice-president of corporate systems and methods for Crum & Forster Corp. in Morristown, N.J. He previously served as assistant vice-president, systems and programming.

Before joining Crum & Forster in 1981, DiRaffaele began his career with Great American Insurance Co., where he served in various underwriting and data processing positions over a period of 15 years.

DiRaffaele earned a B.A. degree from Brooklyn College.

S. Robert DiRaffaele

•••

RUSSELL J. DuROSS was recently named director of information services/accounting for Detroit-based Fruehauf Corp., a supplier of equipment and services for the truck-trailer, automotive, maritime and aerospace industries.

DuRoss will direct the development of information systems in conjuction with Fruehauf Division's accounting activities.

DuRoss, who has been with Fruehauf five years, most recently served the corporation's management information systems department as branch systems manager. He also served as financial systems manager and data base administrator.

DuRoss holds both an M.S. degree in computer science and a B.A. in mathematics from Wayne State University, Detroit.

Russell J. DuRoss

Roderic Butler

•••

RODERIC BUTLER has been appointed director of management information systems for Nuodex, Inc., located in Piscataway, N.J. Nuodex is a manufacturer of coating chemicals and colorants, specialty chemicals, synthetic lubricants and rigid vinyl products.

Prior to joining Nuodex, Butler served Tenneco Chemicals, Inc. as data center manager, a position he held since 1981. Before that he was a computer system consultant to Blue Cross of New Jersey.

Butler holds a B.S. degree in aeronautical engineering from St. Louis University and an M.S. in mathematics from New York University.

•••

M. DOUGLAS MAY has joined the Finance Department as director of management information services for Hardee's Food Systems, Inc. in Rocky Mount, N.C. May will be responsible for the management information systems function for Fast Food Merchandiser, Inc., Hardee's manufacturing and distribution subsidiary.

Formerly director of information systems at Burger Chef, May also held positions in the data processing department of Westinghouse-Nuclear Fuel Division in Pittsburgh, Pa., and Hamilton Cosco in Columbus, Ind.

May earned a B.S. in industrial management from Purdue University in 1967.

M. Douglas May

QAI Meet Set For MIS Heads

ORLANDO, Fla. — The Quality Assurance Institute (QAI) will sponsor a March 7-8 workshop directed at management information systems directors. The workshop will be held at the Dutch Inn here.

The two-day workshop, designed to help managers develop a DP quality plan of action for their organizations, will stress strategies for improving the quality, productivity and credibility of DP activities.

The workshop fee is $495, which includes a manager's library of materials.

More information is available from QAI, located at 9222 Bay Point Drive, Orlando, Fla.

VCI User Workshop Slated for April 24

CHERRY HILL, N.J. — Value Computing, Inc. (VCI) has announced that its 10th annual user workshop will be held April 24-27 at Chicago's Hyatt Regency Hotel.

In addition to tutorials on VCI products and user case histories, Workshop '83 will feature a keynote speech, "The Mini Meets the Mainframe," by Werner L. Frank, head of the WL Frank Computer Group and former executive vice-president of Informatics, Inc.

There is no registration fee for VCI users; nonusers will be charged $300. More information is available from VCI, located at 498 N. Kings Highway, Cherry Hill, N.J. 08034.

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DP Auditing a Yellow Brick Road?

Turnaround Time

By Larry E. Long

Q I am a DP audit manager at a large diversified company. I have eight years in programming and operations and six years in DP auditing. Although my salary has increased dramatically over the last six years, I am becoming increasingly disenchanted with DP auditing as a profession.

I thought that DP auditing would be the Yellow Brick Road to an upper management position. I do not think so anymore. DP professionals consider DP auditors to be accountants, and financial/accounting people consider us to be DP professionals. Some questions:

1. Do you consider DP auditing a good career path?

2. How long should one stay in DP auditing?

3. How difficult would it be for me to get back into DP?

4. Where do you think I should go from here?

A 1. Yes.

2. Until it ceases to be economically and personally gratifying.

3. For you, easy. Try quality assurance, systems analysis or management.

4. To another company which offers greater opportunity.

Information systems auditing is a relatively new discipline whose function is not well understood. This lack of understanding impedes lateral and upward mobility. As a manager, you should take it upon yourself to create an awareness of the information systems auditing function, then promote the positive aspects (and there are many) of greater internal mobility for yourself and your colleagues. Opportunity will follow.

Q The salary levels of my programmer/analyst colleagues are below those of the local area, especially for experienced people. Dissatisfaction with the most recent "increases" added fuel to the fire.

Over the last few years we have been approached several times by union organizers, but have never met to discuss the possibility of unionization. Now, however, people like myself, who had never given unions a second thought, are beginning to talk union.

We would be interested in your opinion on the long-term effects of unionization in a DP shop.

A Programmers and systems analysts are professionals. The performance standard for a professional is pride. Performance is not adequately rewarded in a union environment. Productivity suffers and innovation is dampened.

You obviously have some problems that need immediate attention, but I doubt that unionization is the solution. As amazing as it may sound, I'm aware of several companies whose management information systems (MIS) compensation package is based on erroneous data.

If management is not receptive to working toward salary parity, then I would exercise a professional's prerogative and leave.

Q Last year I graduated from college and joined my father's business, presumably to sell appliances. I convinced him to buy a computer and have since automated all the company's accounting and inventory systems.

I now spend almost all my time programming or operating the systems. I enjoy my work and would like to be able to discuss it with others, but I'm a one-man show.

Association for Computing Machinery and Data Processing Management Association chapters are located nearby. I would like to join one so that I can to talk with people of similar interests. Which one do you think would be best for a person in my position?

A The decision to join one or the other should be based on whether you like the people and the quality and orientation of the chapter activities. Chapters of the same society vary considerably from one city to the next.

I would suggest that you visit each several times. Pay particular attention to the makeup of the active membership.

One group sometimes becomes the dominant force and ultimately determines the type of programs scheduled. The best chapters have a healthy cross section of managers, academics, programmers, analysts, hobbyists and vendors.

I would also be remiss not to mention that there are scores of other societies for MIS professionals, many of which have been listed here.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*

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Calendar

Week of March 6

March 9-11, San Francisco — **Minicomputer Systems: Guidelines for Successful Selections.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Week of March 13

March 14-16, Houston — **IMS/VS Message Format Services.** Contact: Data Base Management, Inc., 1075 Tolland Tnpk., Manchester, Conn. 06040.

March 14-16, New York — **Structured Testing: Tools and Techniques.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 14-16, New York — **Practical Data Security: Implementation and Management.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 14-16, San Francisco — **Telecommunications Management: Cost Reduction Techniques.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 14-16, San Francisco — **Office Automation: Concepts, Systems and Applications.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 14-16, Chicago — **Office Automation: Strategic Planning.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 14-16, Chicago — **Data Processing: Fundamental Concepts.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 14-16, Washington, D.C. — **DP Operations Today: Effective Scheduling and Console Operation.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 14-18, Houston — **CICS/VS Command Level Programming.** Contact: Data Base Management, Inc., 1075 Tolland Tnpk., Manchester, Conn. 06040.

March 15-18, Boston — **Microprocessor Software, Hardware & Interfacing.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

March 15-18, Washington, D.C. — **Computer Graphics.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

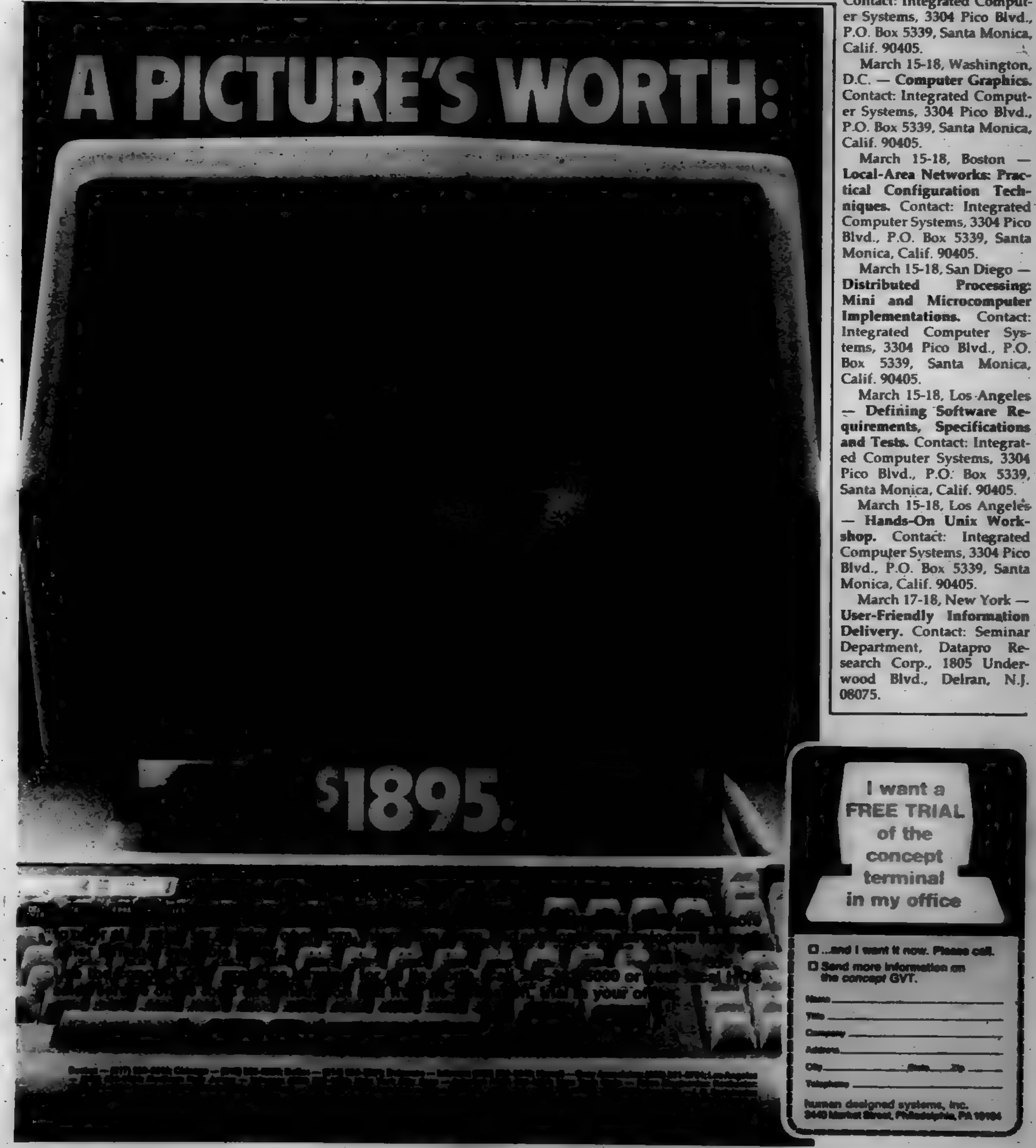
March 15-18, Boston — **Local-Area Networks: Practical Configuration Techniques.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

March 15-18, San Diego — **Distributed Processing: Mini and Microcomputer Implementations.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

March 15-18, Los Angeles — **Defining Software Requirements, Specifications and Tests.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

March 15-18, Los Angeles — **Hands-On Unix Workshop.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

March 17-18, New York — **User-Friendly Information Delivery.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.



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EDITORIAL

A 'Big Stick' Policy?

Remember Teddy Roosevelt's "Big Stick"? This policy allowed him to test dangerous waters without getting his feet soaking wet.

Is IBM wielding its own big stick as it embarks on a planned course of sustained, double-digit growth throughout the '80s? Since the U.S. vs. IBM antitrust suit was dropped, IBM has positioned itself in a way that must look foreboding — if not menacing — to many of its competitors.

For example, IBM recently announced it would begin restricting or eliminating access to certain licensed program materials, including source code and logic manuals (story on Page 67). Those who oppose the policy change claim that IBM can, if it so chooses, severely undermine the efforts of independent systems software houses to compete effectively with the world's largest software company which, of course, is IBM.

The same people also claim that IBM can, if it so chooses, decimate the plug-compatible vendors by restricting them from getting the code information they need to make their machines plug-compatible.

Simple strategy, simple analysis. Devastating results.

But there are those who say IBM does not want to hurt the third-party vendors, much less annihilate the plug-compatible manufacturers, thereby stirring the antitrust ghosts once again. IBM, these people claim, is acting in its best interest by protecting its technology. The company does not want to anger its users and certainly does not want to delay implementation of MVS/XA, its new operating system software, by denying users the development tools they require.

In reality, no one but IBM knows just how restrictive it will be with its program materials. No one can guarantee that he will be denied program materials that someone else can get. No one knows the full range of products to which the restrictions will apply.

Consider another positioning move made by IBM. Last year, the company formed IBM Credit Corp. to phase the parent company out of direct interactions with the used and leased markets. The IBM Credit Corp. could, if IBM wanted, swing deals that would destroy third-party dealers, many observers and dealers feel.

The dealers do not believe IBM would do such a thing. IBM needs the dealers, they claim. But if IBM wanted to . . .

Then there is IBM's recent "aggressive" pricing strategy. IBM knows that if it wants, it can cut its prices and its competitors would have to perform their own profit surgery and write down inventories.

There has been some resistance. The European Common Market countries have filed a complaint charging IBM with unfair competition, and the Association of Data Processing Service Organizations, Inc. has suggested that IBM is up to its old software bundling tricks.

Still, like Roosevelt's gunboats, IBM is poised. But poised to do what? Can all the scenarios envisioned by the antitrust squads actually come to pass?

Did Roosevelt envision a Western world dominated by the U.S.? Perhaps not. But it happened anyway.

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LETTERS

Key to Systems Usability

I was immediately attracted by the lead of Edmond H. Weiss' In Depth ["Usability: Toward a Science of User Documentation," CW, Jan. 10]. He is indeed correct in noting that there is a new emphasis on usability within the systems-building community.

However, Weiss has missed the point of systems usability. What Weiss wrote was an excellent article on preparing user documentation.

To dismiss usability as a "catchword of tired computer people" and to write "the key to usability, of course, is user documentation" probably shows bias. The key to usability, of course, lies in systems design.

The most complete, grammatically correct, well-packaged user manuals (Weiss only gives passing notice to any other type of documentation) will not increase the usability of a system. It will allow those who must use the system to learn how to more quickly — but that's all. As Weiss rightly observes, good documentation should make itself redundant.

But back to usability. My dictionary tells me that usability means "the state or quality of being usable." This quality can only be achieved through systems design, by designing a system that users will want to use because it helps them do their jobs. Those who will use the system must regard it as an aid; no amount of written instructions on "how to" can hope to achieve this.

Tools and techniques available during design to ensure usability are: correct and usable dialogues designed for the appropriate audience, use of scenarios and demonstrations to ensure the system will meet the users' needs and an external architecture to allow it to be delivered piece by piece and provide for ease of maintenance and enhancement.

With these in place, good documentation can contribute to understanding and provide answers to day-to-day questions.

W.E. Harmer

Toronto, Ont.

Who Needs Assistance?

In response to *Computerworld's* editorial "Talk Is Cheap" [CW, Feb. 7], I am ashamed that a publication that represents a profession that is trying to improve its image as business thinkers would publish such an economically illiterate editorial. The basic message presented was the politically ancient one of "reduce the budget deficits, but don't gore my ox doing so."

Of all U.S. enterprises, the computer industry rates high among entrepreneurial firms that have taken high risks and have reaped high rewards for innovative achievements. Highly successful and profitable firms such as Digital Equipment Corp. have the least need for government assistance, yet the editorial seems to imply that there was a cause-and-effect relationship between the reduction of government handouts and DEC's decline in earnings.

If I were a DEC employee, I would be embarrassed by the fact that the amount of direct and indirect government assistance received by DEC is now common knowledge to *Computerworld* readers.

As a taxpayer and sufferer from high interest rates, I agree that the reduction of federal budget deficits should carry a high priority. However, I am not audacious enough to argue that federal assistance should not be eliminated to an industry that has historically been profitable and least needs the assistance.

James R. Rohrman
Manager
Information Systems

Kroy, Inc.
St. Paul, Minn.

SOFTLINE/Werner L. Frank‡

Fake Apples in Hong Kong: Rotten to the Core

While I was in Hong Kong recently, my curiosity and interest were strongly aroused by a bold headline in *The Asian Wall Street Journal* identifying Kowloon Street as "the place to find a fake [Apple Computer, Inc.] Apple II computer."

Following the instructions given in the article, I soon found myself strolling through an open-air market crammed with electronic gear offered for sale alongside vegetables, live frogs, birds and snakes. Indeed, the crowded street was a typical oriental bazaar where traditional wares were mixed with products of modern technology.

The influence of the computer is also evident at the nearby Golden Shopping Center, which is comprised of a collection of indoor retail shops that are slowly being converted to computer store outlets.

In Full View

Out on the street, the "fake Apples" were in full view, operating in about a dozen niches along the storefronts. Four categories of computer gear were available: assembled Apple II units, boards and components, software and computer-related books. All were the so-called counterfeits or pirated material about which we hear so much.

Because of the focus on Apple computers, locals are beginning to designate the area "Apple Street," a name that seems appropriate in light of the prominence and ubiquity of stickers and posters displaying the well-known Apple logo.

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Printer Interface	102	156
Disk Drive	273	275
Monitor	103	89
Printer	492	475

Price Comparison

The price range on the offered "Apples" was from $260 to $370 in four categories. The difference in price is determined by the origin of the fake device. If it is from Japan, it commands the high end of the scale and if from Taiwan, the price is lowest.

The power unit appeared to be the same for all categories. In fact, we were told that the components are basically standard and most are made in the U.S. The purported difference was in the quality of the mother board and the actual mountings of the components. Clearly, guarantees were not available. The units went by such names as APII, Apollo II, Golden and Orange.

'Apple-Compatible'

The claim, of course, is that these computers are "Apple-compatible." In fact, in the *Asian Business Weekly*, the Taipei-based company Unitron, Inc. blatantly advertises the Unitron II Personal Computer as an Apple II-compatible and Digital Research, Inc. CP/M-compatible device including a MOS Technology 6502 CPU, 48K bytes of random-access memory (RAM), 12K bytes of read-only memory (ROM) and 2K bytes of ROM for I/O. Accessories mentioned in the ad include: floppy disk drive and controllers, printer cards, Zilog, Inc. Z80 "soft-card," erasable programmable read-only memory writer, 16K bytes of RAM cards, language cards for Pascal, Fortran and Cobol, an integer Basic card, an 80-col. video card and a PAL card. In the same publication, similar ads from Inter-Orient and World Computers indicate that there is plenty of competition in the fake Apple market.

The Taiwanese are not alone in the business of copying computers. A device from the Philippines described in a recent issue of *Asian Computer Monthly* is a Radio Shack TRS-80-compatible system based on a Z80 microprocessor, 32K bytes of memory and 12K bytes of ROM. The manufacturers claim that this system offers improvements that are not available on the TRS-80, such as a bus-oriented structure, faster cassette I/O and higher resolution video with a reverse display feature. While only a prototype is currently available, the objective is to produce a high-quality product for less than $1,000.

Fake Apples are available at about 20% of the list price of legitimate hardware from Apple. No wonder this company is now in litigation protecting its interest.

Accessories and Peripherals

In addition to obtaining bargain-counter computers, it is possible to get accessories and peripherals (see box above). The U.S. prices shown represent recently published, discounted — not list — prices.

It is interesting to note that piracy is practiced with respect to circuit boards and not electromechanical parts. In the same store that carried the bargain-counter computers, an authentic Osborne Computer Corp. computer was on sale, priced at $2,000, which is higher than the U.S. retail price by several hundred dollars.

What is the legal issue here? Is producing electronic "compatibility" illegal? The notion of plug-compatible manufacturers has apparently obtained general acceptance, at least in mainframe circles. The purveyors of the hardware copies assert that they are simply assembling the same components Apple does and, hence, are breaking no laws.

However, this is not the case. The issue is one of compromising the copyrights that belong to Apple and others. The procedures in ROM are being claimed by Apple to be its proprietary and protected asset. A legal

(Continued on Page 24)

HUMAN CONNECTION/Jack Stone‡

Start Training DPers First Day on the Job

This is the first in a two-part series titled "Should We Hire or Nurture DPers?"

My article "DP Experience: Hire or Nuture From Within?" [CW, Nov. 29] brought forth a mailbag of reader responses. In this series, I will present segments of letters that typify reader viewpoints.

Les Batemate, systems and programming supervisor at Home Savings of America, Los Angeles, described what may be a unique training program that involves the employee from his first day on the job.

"I've been in data processing since 1967, and most of my experience has been with companies that either did not promote from within at all or did so only on a very limited basis," he said.

"A company posture of not promoting from within accomplishes at least two things, neither of which are positive. The first is that the company leaves the employees with the attitude: 'You've got the job you were hired for and that's as far as you're going with us.' The second is that employees have no particular reason to expand their education unless it will help their marketability in the next job-hunting session.

"When a company establishes a policy of internal hiring, employees are much more apt to prepare themselves for the next step up. They may do this on their own or it may be a result of encouragement by the company. If the preparation is done on the employee's own time, there is no cost to the company."

Intertwined Futures

"Of course, the positive feelings that are generated with such a policy cannot be measured," Batemate said. "It certainly increases the feeling of belonging to a team and indicates that both the individual's future and the company's future are intertwined.

"In my previous job, which lasted four years, I received good reviews, but only one position promotion. By reviewing the company's track record on hiring, I finally figured out that I had gone as far as I could. My firm simply did not promote from within for their higher positions.

"Before looking for another job, I discussed my perceptions with my supervisor. She had been with the company for over 10 years, and I felt that if I were wrong, she would point out the errors. She listened attentively and when I finished, all she could say was that she agreed with me.

"Two weeks after I left the company, she quit for similar reasons. The company lost 14 years of experience between the two of us, not to mention the future potential. Managers worry about training costs and what they lose if the trained employee leaves. But what about the cost of replacing 14 years of company experience?"

A Training Plan

"A training plan needs to get underway from the moment a person is hired," Batemate said. "Training to help the new hire adjust to his new environment will greatly reduce the time it takes for him to become productive. After the new hire has been with the company through the probation period, it is a good idea to discuss what he has in mind for future goals.

"A training curriculum should be established to help the employee reach those goals. An allocation of hours should be made for training time during the workweek. Records should be kept of employee progress with training, and the employee should be provided with some method of critiquing the courses and reporting his findings.

"A combination of video training, which allows each DPer to go at his own speed, and in-house formal training, given by senior staff members, seems to work best. All training courses that are completed would become part of the employee's profile. When opportunities for advancement present themselves, these employee profiles would be reviewed for possible candidates.

"What I have just reviewed is a thumbnail sketch of the training program where I now work. This is the first company that I have worked for with this kind of program, and the differences in morale and professionalism are obvious.

"It should also be noted that the average length of employment for the data center here is seven years, ranging from new hires to over 15 years, and that says a lot for the benefits of an ongoing, continuous training program.

"To wrap it up, I view the issue of whether to hire or to nuture from within this way: The company must pay the price for experience either way, but by nurturing, its return on investment is far greater."

LETTERS

Barriers to Understanding

Perhaps the greatest single problem that faces data processing directors who seek to secure properly their data and the means of processing it is understanding what the problems actually are.

Among the barriers to achieving that understanding are inaccurate reports of computer-assisted crime that appear in the general press and trade press.

The result is the selection of security measures that, on the one hand, are applicable to problems that DP directors do not have and, on the other hand, do nothing for the problems they do have.

Consider the article "Bank of America, Merrill Lynch Hit by Scam" [CW, Dec. 20] on the attempted theft from Los Angeles' Bank of America and Merrill Lynch, Pierce, Fenner and Smith, Inc. of Los Angeles. It is essential to an understanding of what happened in that case that we distinguish between console operators and terminal operators, between modification of data and modification of programs and indicate whether even modest safeguards were in place and breached.

It is my understanding that the "computer operator" in question was at a terminal, that he modified data, not programs, and that the code did not contain any meaningful safeguards.

Robert H. Courtney Jr.
President

Robert Courtney, Inc.
Port Ewen, N.Y.

Management Tech Degree

I read with great interest the article "MIT Offers Degree in Technology Management" [CW, Dec. 6]. I applaud MIT's efforts. Clearly; more programs of this nature need to be offered by more schools.

In that vein, I must inform you that MIT is not the first in the nation to offer a master of science degree in the management of technology.

American University, Washington, D.C., has offered a master of science degree in management of technology for over 20 years.

American University's program is similar to MIT's; they are both aimed at preparing graduates to assume roles of increasing managerial responsibility for technology-based organizations.

However, the program at American University does allow students to specialize, or major, in the following fields:

- Computer systems applications.
- Management information systems.
- Operations research.
- Environmental systems.
- Scientific and technical information systems.
- Science, technology, policy and administration.

The prerequisites for the programs at American University and MIT are comparable. However, American University does offer both a thesis and a nonthesis option for graduation.

Donal D. Hogan
Systems Analyst

Columbia, Md.

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Fake Apples In Hong Kong

(Continued from Page 23)

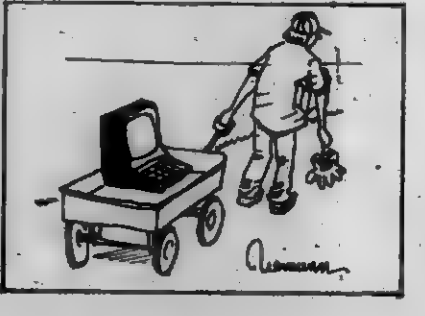
action is now under way to establish this point of law. In the meantime, U.S. Customs is on the alert to confiscate illegal Apples should they be brought to our shores.

If the legalities are not yet clear with respect to hardware, the same cannot be said for software. With complete disregard for proprietary rights, the shopkeepers in Hong Kong have diskettes marked with well-known brand names, such as Xerox Corp.'s Wordstar and Visicorp's Visicalc. Each is a pirated copy of software (some from protected versions) offered at 15% of the U.S. list price. It is also possible to purchase Taiwan-produced photocopies of the software-associated documentation for approximately $6/copy.

U.S. software authors and publishers are beginning to react to this counterfeiting threat. Software vendors have recently formed a special group within the Association of Data Processing Service Organizations, Inc: to gather industry support and generate action in dealing with the problem of protection and other issues of common concern.

It is estimated that the quantity of unauthorized copies of software in the U.S. equals about 40% of those that currently exist and is many times that number overseas. Although the same problem of counterfeiting exists today with respect to video cassettes, the economics for software are aggravated because the total dollars involved are greater by almost an order of magnitude. The industry is, therefore, in desperate need of an innovative approach to mitigate these economic losses.

Frank is an independent consultant and president of the W.L. Frank Computer Group located in Calabasas, Calif.



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CIRCULATION DEPT. [illegible]

Detach here, fold, and place in post-paid envelope attached through binding.

'Superbug' Enhances CMS capabilities

Intel Buys Tool to Speed DBMS Testing

By Lois Paul
CW Staff

AUSTIN, Texas — Even software vendors are turning to packaged solutions these days.

The quest for a better way to test future releases of its System 2000 data base management system (DBMS) led Intel Corp. to buy a debugging package from the small, Hartford, Conn.-based Technology Consulting Corp. The debugging package, Superbug, essentially provided an enhancement for IBM's CMS debugging capability.

"CMS has a good debugging capability but, for some reason, IBM didn't really carry it through as fully as [it] could have. It is not really a nice, flexible capability," observed Jim Craig, development manager for the IBM VM version of System 2000.

The main thing Superbug provides is support of breakpoints in the Writeable Discontiguous Shared Segments (WDSS) available in CMS, according to Craig. Breakpoints allow a programmer to stop the execution of code at preset points so he can query all of the registers and data areas and see what is happening.

WDSS provides common storage in the nucleus of the software system that can be used to communicate between machines. Craig explained that this is essential for the IBM version of System 2000 because the DBMS communicates across virtual machines and supports concurrent updating in the CMS environment.

The fact that IBM's CMS debug package does not support breakpoints in a WDSS does not concern most people, Craig ad-

(Continued on Page 28)

Cincom Utilities Target Total For PDP-11s Under RSX-11M

CINCINNATI — Cincom Systems, Inc. has announced a package of utilities for the company's Total data base administration function for Digital Equipment Corp. PDP-11 computers under RSX-11M.

Total Utilities enables the user to perform functions including unload and reload of individual data base files, initial loading of data base files, adding and deleting records from data base files and production of data base statistics, according to a spokesman for the vendor.

A spokesman said records can be loaded into a newly defined data base on a file-by-file basis without the need for special programs. Records can be added and deleted on an individual basis. Data base statistics provided include number of chains, average, shortest and longest length of chains, number of active records, number of synonyms and number of out-of-block synonyms.

The utilities costs $1,750 for PDP 11/23s and 11/24s, $3,000 for PDP 11/30s to 11/60s and $4,000 for PDP 11/70s from Cincom at 2300 Montana Ave., Cincinnati, Ohio 45211.

'Guardian' Gets DL/1 Support

FORT LEE, N.J. — On-Line Software International, Inc. has announced enhancements to its Guardian on-line IBM CICS security system including full DL/I support and permanent on-line maintenance.

Guardian reportedly allows CICS users to make changes on-line to security policy, allowing new resources to be added or deleted dynamically.

Prices start at $20,000 for DOS and at $27,500 for OS from the firm at Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

Vtam Interface Added to Adabas To Support DDP

RESTON, Va. — Software AG of North America, Inc. has released a data base management system interface to support data base processing in a distributed environment.

Adabas/Vtam is said to allow application program processing and Adabas data bases to be located anywhere within the organization, permitting the location of data and application processing to be based on business requirements and not on software and hardware limitations.

Adabas/Vtam runs on IBM and plug-compatible mainframes under MVS, OS/VS1 and DOS/VSE. Prices start at $24,000 for the first pair of nodes in a network with lease plans available. The vendor is located at 11800 Sunrise Valley Drive, Reston, Va. 22091.

Aid Witholds Mandatory Taxes

ATLANTA — Business Software, Inc. has announced Pensiontax, a software package designed to withhold the mandatory taxes required under the Tax Equity and Fiscal Responsibility Act of 1982 from pensions, annuities, stock bonus plans, Individual Retirement Accounts or profit-sharing plans.

Offered in Ansi Cobol for most mini and mainframe systems, Pensiontax was designed for the specific purpose of deferred income taxation, the vendor said. It reportedly supports tax methods for normal, supplemental, advance, cumulative and nonresident periodic payments, as well as flat percent, advance and qualified total distribution nonperiodic payments. The software will compute the tax on either gross or net payments, as well as on additional amounts or percentages as requested by recipients. The package automatically converts taxing authority codes to equivalent Pensiontax codes.

The price of the software, which includes one year of support, is $4,900. Pensiontax Support Service, which is priced at $900/year, furnishes updates, periodic enhancements, documentation updates, installation assistance, telephone consultation and an ongoing warranty, the vendor said from Suite 107, 3957 Pleasantdale Road, Atlanta, Ga. 30340.

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Shared Tape Allocation Manager, STAM, automatically manages mountable devices, (tape and disk), in multi-CPU installations. Allocation decisions for shared device pools are made automatically, thus eliminating the potential for disastrous operator errors and more effectively using these valuable resources than is possible with manual control.

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Superconsole is designed to provide a single console image for a multi system environment where console messages can be merged together to create a single stream on one or more designated consoles. The result is a more streamline and productive operating environment. Operators will have to monitor only one console instead of many eliminating the need for redundent hardware and personnel.

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Do You Have a Story to Tell About DP Manufacturing Systems?

CAM, MRP and FMS are some of the hottest new topics in the world of computers. *Computerworld* wants to tell its readers more about computer-aided manufacturing, materials resource planning, flexible manufacturing systems, robotics and shop floor control. But we need your help.

The April 25 issue of *Computerworld* will provide in-depth coverage of manufacturing in transition and the part computerized systems are playing.

We are looking for articles on how the new manufacturing technologies fit together and what they all mean to DP operations in a manufacturing environment.

Industrywide tutorials on all aspects of computers and manufacturing are welcome. Other areas of interest include user experiences, application stories, studies, management strategies and psychological effects.

Articles should be between five pages and eight pages, double-spaced and typed. The deadline is March 18, but the sooner we get your manuscript, the better the chance it will be used.

Submit your stories to Bruce Hoard, *Computerworld* Editorial, P.O. Box 880, 375 Cochituate Road, Rt. 30, Framingham, Mass. 01701.

For Displaying IBM Vsam Info

On-Line Tool Announced

BOSTON — Corodale, Inc. has unveiled an on-line programming tool for displaying IBM Vsam catalog information at a CICS/VS or Altergo Products, Inc. Shadow II terminal.

Vsam/Display, as the product is called, runs under IBM's DOS/VS or DOS/VSE with a minimum partition size of 128K bytes. It reportedly provides an interactive menu-driven environment in which the user can retrieve various levels of information about Vsam clusters and paths. With this software, the user can browse Vsam clusters and paths, using selection criteria such as cluster type, cluster name or both. Creation and update dates are included in the display.

Detail information for a specific cluster also may be displayed, the vendor said. If the cluster is a Key Sequenced Data Set (KSDS), detail information is displayed for both the data and index components. Detail information includes component attributes; Execute Channel Program count; number of records added, deleted or replaced; high used and allocated relative byte address; key position; device type; allocation unit; and disk utilization percentage. The names of the associations and extents of a specified cluster may be displayed as well, the vendor said.

Vsam/Display is available immediately, and its permanent license fee is $1,500. It also is available on a one-year lease basis for $120/mo, the vendor said from 211 Congress St., Boston, Mass. 02110.

'Zeke' Gets Report Features

ARLINGTON, Texas — Southwest Software Services, Inc. has announced Release 2.0 of Zeke — The Controller, an automated scheduling and dispatching package for users of IBM's DOS/VSE operating system and IBM's VSE/Power software utility.

Release 2.0 contains a report writing facility that allows users to tailor scheduling and management reports. The user can define selection criteria, desired fields, page breaks, sequences and formats. In addition, several standard reports are automatically produced, the vendor said.

In addition, Release 2.0 includes a forecast feature, which allows users to schedule future reports, the vendor said.

Release 2.0 costs $9,500, for a permanent license, the vendor said from 36022 E. Randol Mill Road, Arlington, Texas 76011.

'C-SLF' Targets Univac Users

DOWNERS GROVE, Ill. — Circle Software Corp. has announced Circle-Systems Library Facility (C-SLF), a set of callable subroutines that is said to allow Cobol, Fortran and assembly language programs to read and write Sperry Univac librarian files.

The package runs on Univac 90 series and System 80 hardware under the OS/3 operating system. C-SLF augments standard I/O functions with Find and Stow functions to process the library directory, a spokesman said.

C-SLF can be used to find references in a particular data set or to locate where a particular Cobol structure is used, the vendor said. The package allows custom programs to be created to extract answers to questions from librarian files.

C-SLF is also said to simplify language upgrades, system changes, new hardware or data structure changes. A license costs $395 from the vendor at Suite 240, 1100 31st St., Downers Grove, Ill. 60515.

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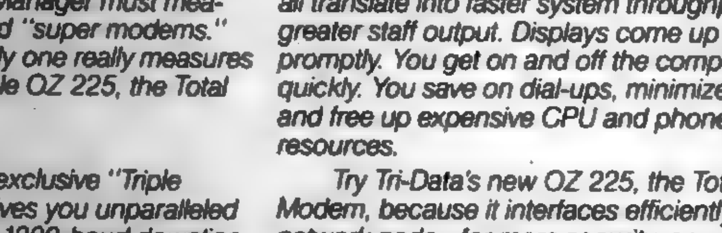

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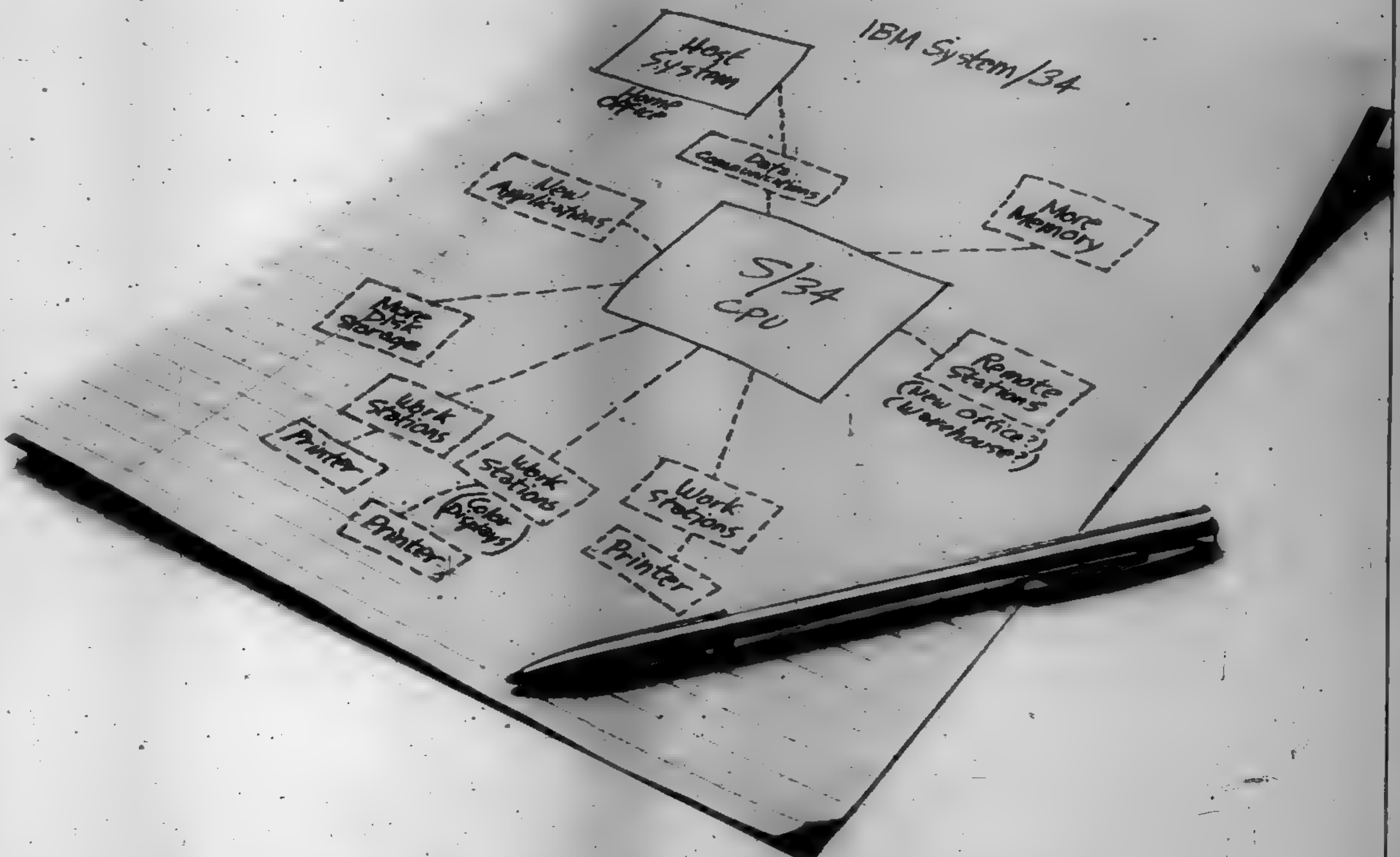

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Intel Turns to 'Superbug' Package To Aid in System 2000 Testing

(Continued from Page 25)

mitted, "but it so happens that with System 2000 we really needed that to manage some quality assurance testing that we wanted to do, transferring this data between machines.

"We wanted to be able to step through the code an instruction at a time and see what was going on and make sure it was all just exactly right, because it is much easier to do it that way then to try to debug something and have something go wrong when you are running it at nanosecond mode when you are really in production."

As a software vendor, Intel's first response was to build in the necessary code itself. "We were surviving," Craig noted, "but we weren't really happy with having to go to all that trouble."

When an advertisement announcing Superbug arrived in the mail about seven months ago, Craig was assigned to evaluate it as a possible solution. As it turned out, Superbug initially did not support WDSS. "They improved the product by working with us on the phone," Craig said about Technology Consulting. "I think that helped both companies. We wound up with what we needed, and they wound up knowing how to do some stuff also."

The current version of Superbug that Intel is using allows Craig's group to set breakpoints in WDSS and to control who has control. "It does exactly what we need," he said. Craig noted that the code in the WDSS used by System 2000 is important and contains some privileged instructions. Because of this, it has represented somewhat of a bottleneck.

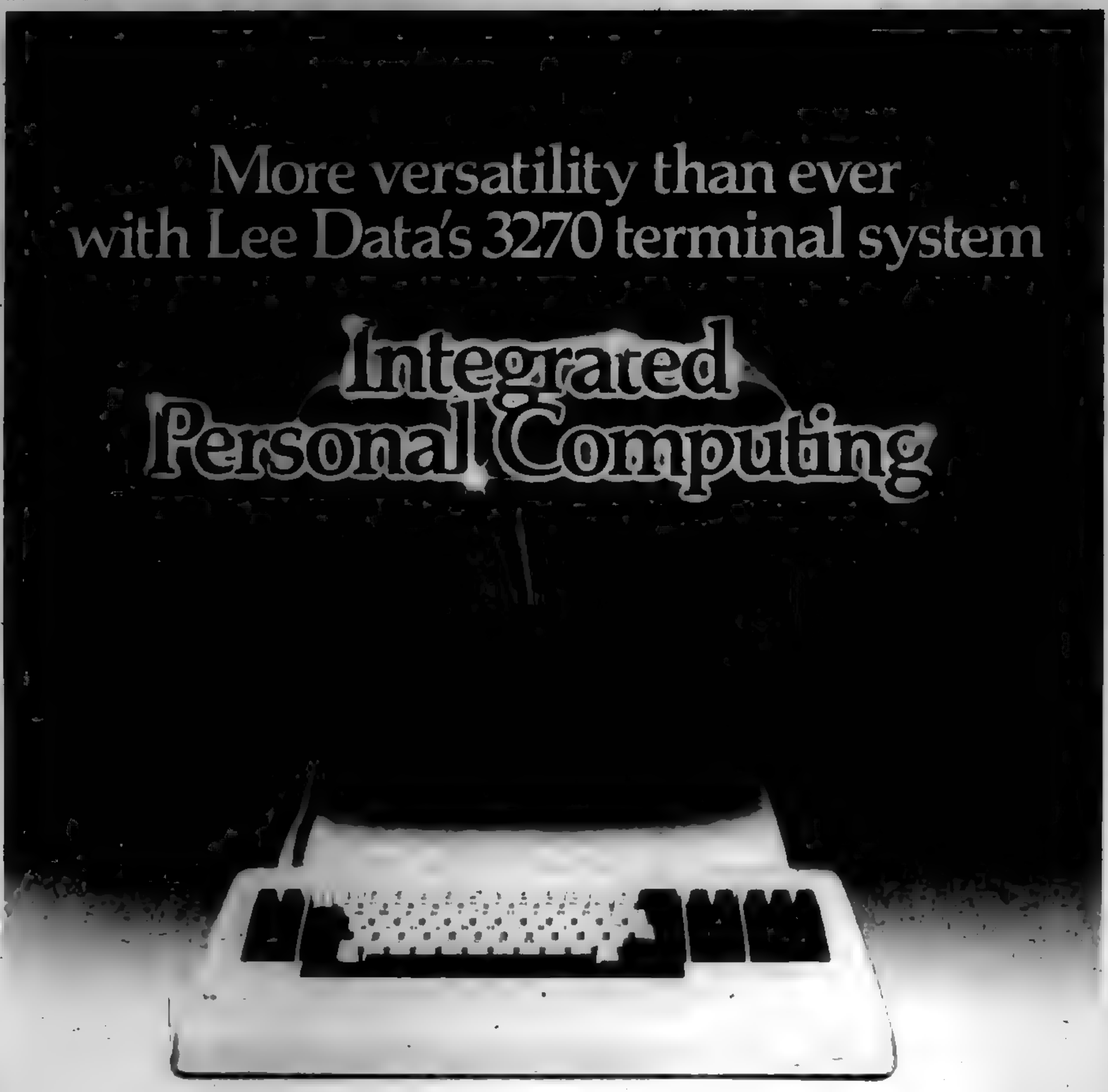
'Can Monitor Everything'

Before it began using Superbug, Craig's group had problems determining exactly how many instructions were being executed so it could minimize them. "With Superbug, that problem goes away. We can monitor everything," Craig said. "Besides, we can do without certain instructions that we require with other operating systems. We have found several things that we can do without and speed things up a little bit without sacrificing the integrity of the system."

Other features that Intel has discovered in Superbug include the ability to keep breakpoints set (IBM's CMS Debug requires manual resetting of breakpoints each time they are passed, Craig said) and to name the breakpoints, which has enabled Craig's group to set up a data dictionary that says where all the data areas are and labels the breakpoints.

"In the case of System 2000, our data areas are fairly standard. We don't change them with every release. So we were able to set up some little dictionaries for our use and more or less automate the way Superbug works to integrate it with System 2000 a little bit. So now our programmers don't have to go through and redefine anything."

Although System 2000 users will not see any Superbug code or realize the results of it specifically, Craig said they will see better releases of the product because of Intel's use of this package.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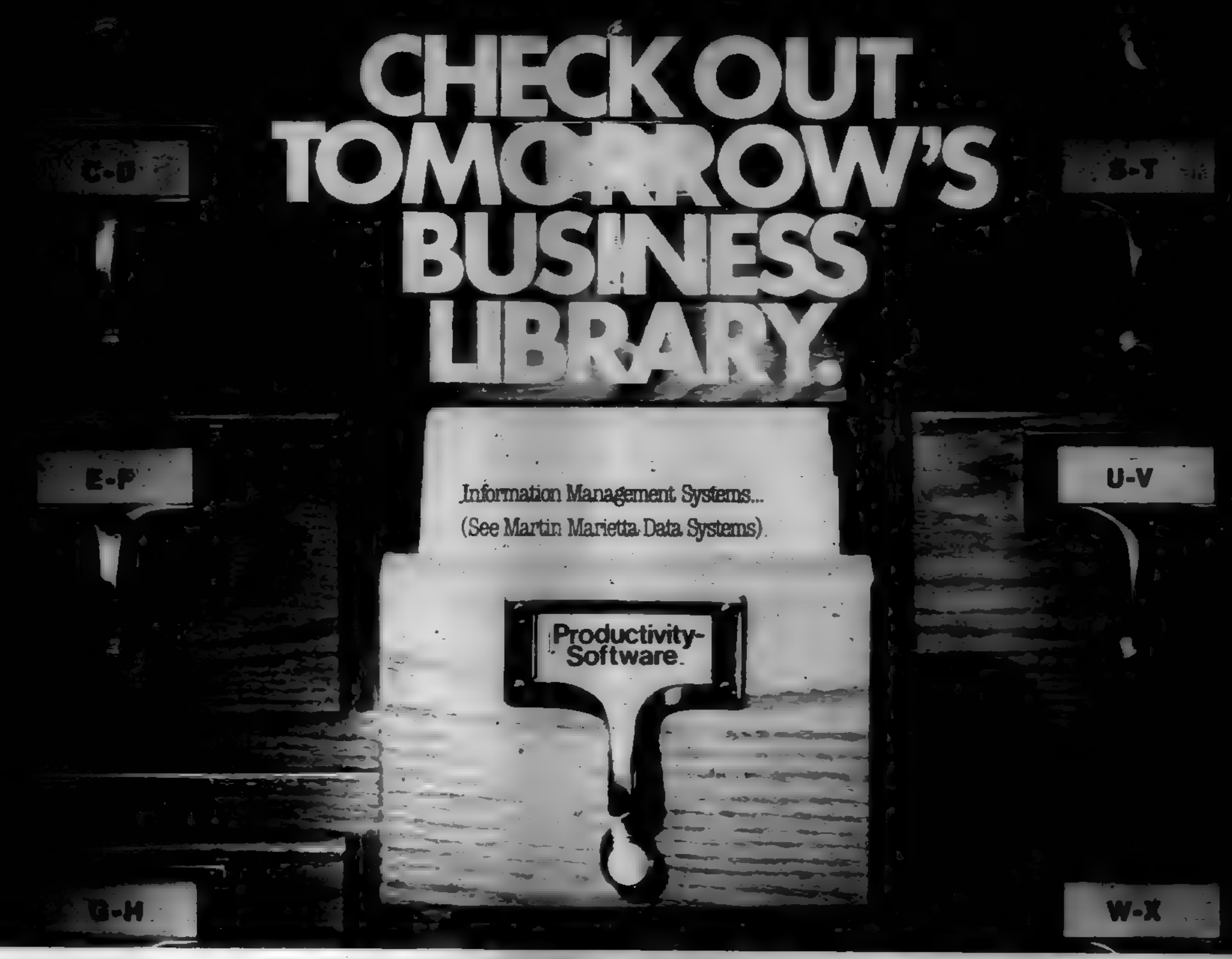
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Method/1 Project Manager Receives Series of Updates

CHICAGO — Arthur Andersen & Co. has introduced a series of updates for its Method/1 project management and systems development methodology.

Two areas of the methodology were enhanced. Under Information Planning, updates include new methods for tying systems into the organization's overall strategic plan, planning approaches to office automation and planning methods to document current information needs and establish application strategies. Under the Systems Programming project, updates covered the following three areas:

- The design phase — includes an enhanced approach to address the expanding availability of application software and systems development tools. An approach to systems prototyping is included.
- User training — techniques for developing end-user procedures have been defined.
- Systems management — extensively enhanced in the areas of production systems support, the maintenance function, to provide thorough management guidelines in the day-to-day systems operation.

Other updates include new topics in the areas of telecommunications and data security.

The updates are provided to current Method/1 users, either under the initial lease arrangement or after expiration, as part of an annual service agreement. The Information Planning service agreement costs $2,500, and the Systems Programming project service agreement costs $4,000 from Arthur Andersen & Co., 69 W. Washington St., Chicago, Ill. 60602.

Spreadsheet Out For Wang VS

GLEN ELLYN, Ill. — Hourglass Systems has announced an electronic spreadsheet package for Wang Laboratories, Inc.'s VS series of computers.

Called Fast Figure, the package includes depreciation, present value and net present value, internal rate of return, compound growth functions, standard deviation and "what if" analysis, a vendor spokesman said. Three-dimensional file sharing allows users to prepare multiple reports from the same file without data reentry.

Fast Figure costs $600 from Hourglass Systems, P.O. Box 312, Glen Ellyn, Ill. 60137.

New Generation Offers Packages For System/38

ROSEVILLE, Calif. — New Generation Software has announced packages for the IBM System/38.

Job Accounting/38 provides computer usage reports that can be accessed on the screen or in a printed format. A global rate system can be established to apply to all users or specific rates can be applied to users according to the following variables: fixed rate, CPU time used, clock time used, disk consumption and number of lines printed, a spokesman said. The price is $1,500.

CPA Application Software offers 12 separately priced modules: practice management package, $12,000; financial reporting, $12,500; professional accounts receivable, $4,000; financial modeling, $975; tax estimating, $950; payroll/checkwriting, $6,000; staff scheduling, $6,000; due date monitoring, $4,000; random number generator, $1,200; loan amortization, $800; accounts payable, $5,000; and depreciation, $4,000.

Worksheet/38 is a spreadsheet financial modeling system featuring a 702-col. by 999-row matrix, relational modeling, Help features and advanced matrix manipulation, the vendor spokesman said. The price is $975.

Additional information is available from New Generation Software, located at 341 Lincoln St., Roseville, Calif. 95678.

Utility Tools Fit Honeywell

PHOENIX — Technology Information Systems, Inc. has announced five utility packages intended to enhance the performance and productivity of Honeywell, Inc. large-scale systems.

The Generalized Monitoring Facility is a software systems monitor designed to aid in analyzing system performance problems. It is available with training for $985.

The Performance Enhancement Package (PEP) is a systems-oriented software product intended to enhance the throughput of Honeywell Series 6000, Level 66 and DPS 8 systems in the range of 20% to 50% with no hardware modifications, the vendor claimed. PEP-1, for small systems, is available for $20,000. For medium-size systems, PEP-2 is priced at $60,000. PEP-3, which is for large-scale systems, is priced at $100,000, according to the vendor.

The Storage Enhancement Package reportedly increases the mass storage capacity of Honeywell devices and reduces I/O overhead of removable and fixed-mass storage units. The package is available for $25,000.

Readcobol, a program designed to reduce Cobol maintenance, is said to arrange programs into a standard format and to allow for retroactive standard implementation. It is priced at $7,500.

Speedcobol is intended to reduce the number of programmer keystrokes in either a standard or user-defined shorthand notation or both. It is available for $3,000.

Maintenance for these products is mandatory for the first year and costs about 15% of the purchase price of the software, the vendor said. Technology Information Systems is located at Suite 808, 2721 N. Central Ave., Phoenix, Ariz. 85004.

Radio Shack Introduces the New TRS-80® Model 12 and a New 12-Megabyte Hard Disk

Remarkable Desktop System

The new TRS-80 Model 12 microcomputer offers a unique combination of power, versatility and easy expandability. Together with our new 12-megabyte hard disk, it can save valuable "big machine" time in any data processing department.

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The TRS-80 Model 12 (Cat. No. 26-4004) includes an 80K memory and a built-in 1.25-megabyte double-sided, double-density floppy disk drive. It has an 80 × 24 high-resolution 12" green phosphor screen and a detachable 82-key low-profile keyboard with a numeric datapad and eight special-function keys.

Add Our New Hard Disk

For large on-line data requirements, expand with our new 12-megabyte Hard Disk Drive (26-4152, $3495). You can add up to three more secondary drives (26-4153, $2495 each) for a total of 48 million bytes of data storage.

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The TRS-80 Model 12 is ideal for use in data processing departments because it offers the versatility that a mere terminal lacks. It can be outfitted easily for 3270 and 3780 BSC—giving you low-cost access to IBM® and DEC® mainframes.

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Retail prices may vary at individual stores and dealers. Special order may be required. Some applications may require an optional-extra Model 12 card cage. Hard disk requires card cage and installation, not included. IBM is a registered trademark of International Business Machines Corp. DEC is a registered trademark of Digital Equipment Corp.

'SAS/Replay-CICS' Out

CARY, N.C. — SAS Institute, Inc. has announced SAS/Replay-CICS, software designed to enable IBM CICS users to store, manage, manipulate, retrieve and replay SAS/Graph displays.

Until now, some CICS users have not been able to use SAS/Graph because terminals suported by this package were attached to CICS rather than to TSO or VSE, the vendor noted. With SAS/Replay-CICS, the output from SAS/Graph is placed in a special shared Vsam file, the vendor said.

SAS/Replay-CICS is described by the vendor as a simple data base manager with SAS retrieval capabilities. It is intended for installations where SAS/Replay-CICS is installed on a system other than the system on which SAS is installed.

The software is scheduled for availability to IBM DOS/VSE installations during the second quarter of 1983 and to OS installations during the third quarter.

It is priced at $2,500 for the first year license for current U.S. SAS customers, according to SAS Institute, Box 8000, Cary, N.C. 27511.

Guide Lists Utilities

CHERRY HILL, N.J. — Data Decisions has released a directory of 190 programming support packages offered for most mainframes and minicomputers as well as for microcomputers running Digital Research, Inc. CP/M and MP/M and Bell Laboratories' Unix-based operating systems.

Products include report writers, application generators, flow charters, documentation aids, conversion/migration aids, simulation/modeling packages, editors, listers, performance/activity analyzers, test data generators, dump formatter/analyzers, job control language support packages, screen support packages and preprocessors.

The "Programming Support Directory costs $25 from 20 Brace Road, Cherry Hill, N.J. 08034.

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Emulator Out for Intel/DEC

DOWNERS GROVE, Ill. — A software emulator and program analyzer for programs written for Intel Corp. 8086/8088 microprocessors on Digital Equipment Corp. PDP-11 minicomputers has been introduced by Systems & Software, Inc.

Softprobe/86 is said to extend traditional debugging facilities.

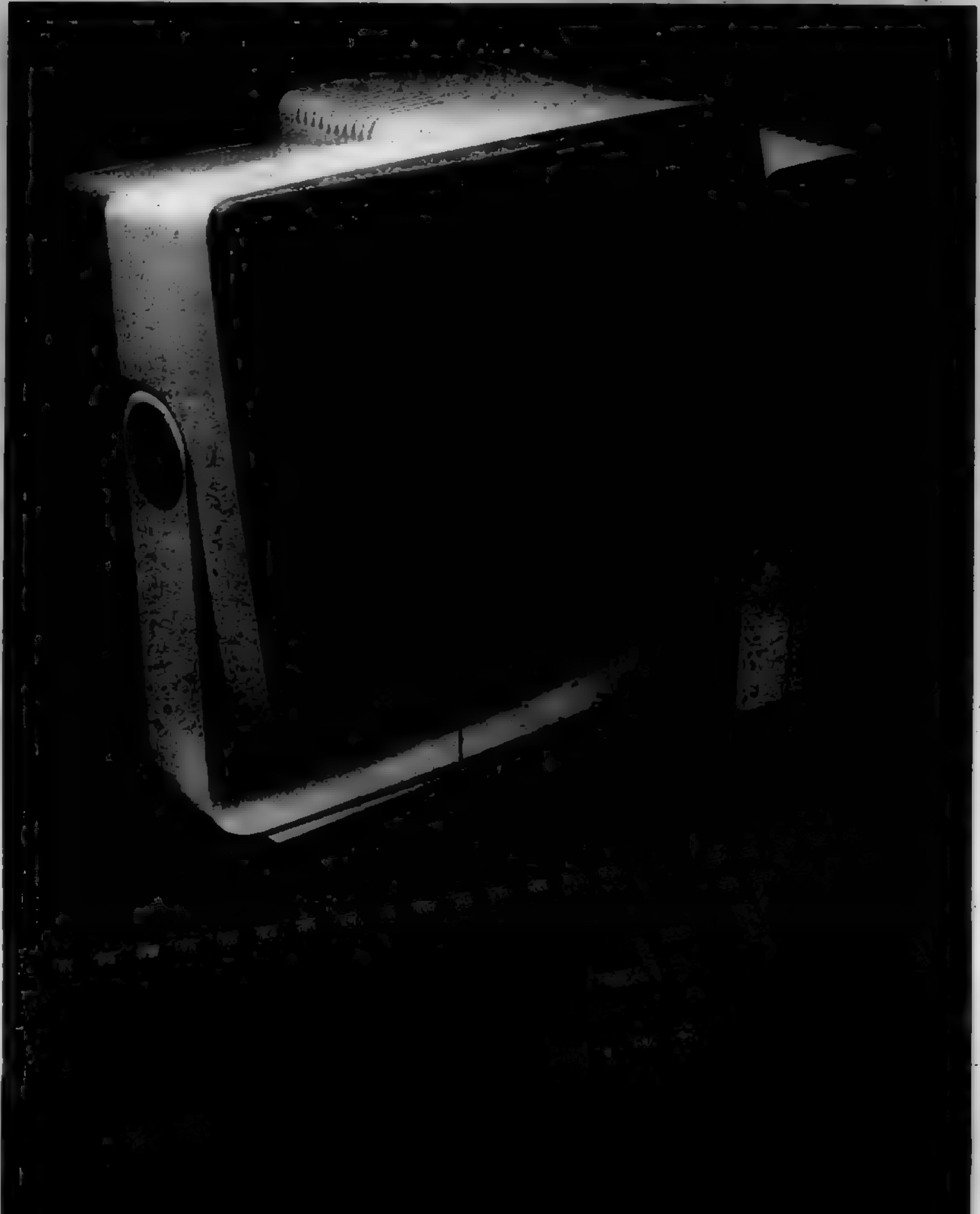
The package runs on PDP-11s running under RSX-11M operating systems. Prices start at $2,000 from 1319 Butterfield Road, Downers Grove, Ill. 60515.

'Bankpak' Runs on DEC VAX-11

BURLINGAME, Calif. — Bankpak, a software package designed for managing commercial lending portfolios on Digital Equipment Corp. VAX-11 systems, has been introduced by McCue Systems, Inc.

The on-line system reportedly allows account officers to access up-to-the-minute data from a desktop terminal rather than depending upon daily batch reports. Data input is menu-driven. Bankpak can quote new loans and pay off terms, assign float days, share subportfolios with other institutions at adjusted rates and produce historical activity reports.

A one-time license fee for Bankpak costs $55,000 including complete installation, on-site training and service support. A maintenance agreement is offered to cover software upgrades, and the package also is available on a time-share basis. McCue Systems is located at Suite 212, 330 Primrose Road, Burlingame, Calif. 94010.



JCL Generator Gets Support, Enhancements

ATLANTA — Eclectic Technology, Inc. has announced additional support for its Master JCL Generator, which was designed to enable users to build JCL and submit jobs from most teleprocessing environments.

Master JCL Generator is available for IBM MVS/TSO, MVS/CICS, VS1/CICS, DOS/VSE/CICS and VM/CMS systems.

Among its enhanced features is the generation of JCL by installation-defined IBM 3270 menus. For non-full-screen terminals, JCL may be generated using keyword parameters similar to the MVS Clist facilities, the vendor explained. In addition, data entered during previous invocations may be recalled.

Master JCL Generator includes a distribution data base that contains menus for IBM utilities, Resource Allocation Control Facility functions, Cobol, PL/I, Fortran and assembler. JCL may be reviewed and edited before job submission, according to the vendor.

In a production environment, user exits provide the facility of job submission without the user having access authority to data sets referenced in the JCL. Condition JCL statement generation is available, the vendor noted.

The software may be purchased for $7,500 or leased for $275/mo, the vendor said from 2978 Sumac Drive, Atlanta, Ga. 30360.

DG's SPSA Support Rates Raised an Average of 22%

WESTBORO, Mass. — Data General Corp.'s Software Services Group recently increased rates an average of 22% and expanded services for its Software Product Service Agreement (SPSA), a customer support package for users of DG software products.

The new services apply to three levels of SPSA service:

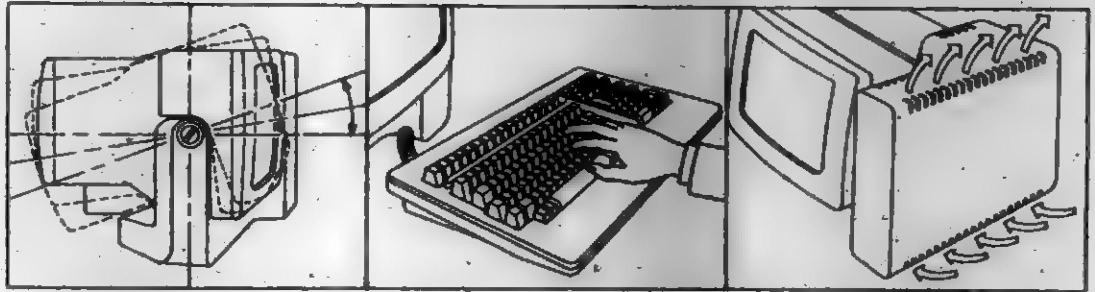
- Level 3 — covers toll-free telephone assistance for users and fast distribution of software updates.
- Level 2 — additionally covers on-site service visits at no charge.
- Level 1 — includes Level 3 and 2 coverage plus quarterly on-site visits for consulting and preventive maintenance.

Also, the group introduced a plan to permit users to extend SPSA service to multiple operating systems at a reduced rate. Previously, separate service agreements were required for each operating system. The plan is intended for users of the firm's Real-Time Disc Operating System (Rdos) family of software, which includes the Disc-based Operating System (DOS) and the Interactive Cobol Operating System (Icos). Users reportedly can extend SPSA coverage for each additional operating system at a cost 30% less than a new agreement.

Enhancements to service under the SPSA include a monthly report on the customer's use of the toll-free telephone support service as well as a microcode subscription service for users of DG's 32-bit MV/Family computers.

More information is available from Data General, located at 4400 Computer Drive, Westboro, Mass. 01580.

The new 970 from TeleVideo. Nothing else looks like it. Nothing else performs like it.



Productive office work depends on people and their equipment working efficiently together.

That's why we have engineered the exciting, new TeleVideo 970 to perform better than any other terminal.

For instance, only our "natural balance" tilting mechanism lets you easily adjust the screen at a touch, so you avoid neck-craning, straining and glare.

Our unique keyboard is designed to avoid user fatigue. We've created a natural palmrest, sculpted keys and the best ten-key accounting pad in the industry. Our non-volatile function keys save time and energy.

Like every feature of the new 970, the screen is designed for ease of use. Our non-glare 14-inch green screen is restful on the eyes, and its 132 column display can format more information. All in highly legible double-high, double-wide characters.

Our communications protocol is the industry standard ANSI 3.64.

As you probably know, most terminal downtime is caused by overheating that results from extended use. There's no such problem with our unique vertical convection cooling tower.

And because we wanted to extend the life of your CRT, we've installed a screen saving feature that automatically turns it off after fifteen minutes of idle time.

Naturally, like all TeleVideo terminals, service is available nationwide from General Electric's Instrumentation and Communication Equipment Centers.

The new 970 from TeleVideo. Nothing else looks like it and nothing else can perform like it.

For more information about TeleVideo's new 970, call 800-538-8725; in California 408-745-7760.

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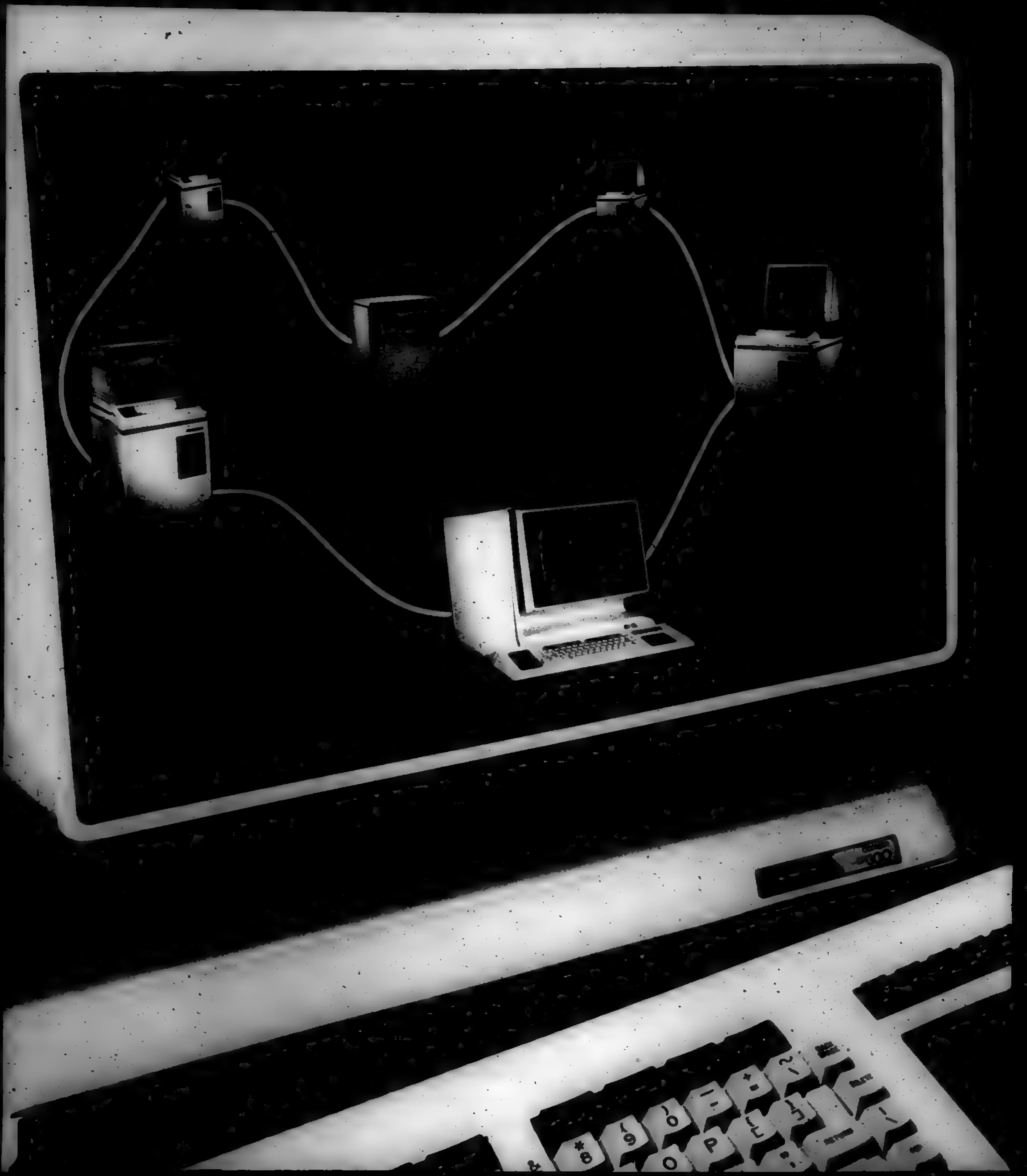

the $10,000 desktop mainframe.

THE NEW APOLLO DN300 WILL COMPLETELY CHANGE THE WAY TECHNICAL PROFESSIONALS USE COMPUTERS.

The DN300 is quite possibly the single most important computer system ever introduced for the technical professional. For the first time ever, these technical professionals have fingertip access to a desktop mainframe, and all the power that goes with it. The power to utilize time in the most efficient possible way. The power to increase technical productivity and innovation. The power to try out and refine new ideas and concepts. The power to reduce design-time cycles. The power to create better, more cost-effective products.

In a unit that takes no more space than a daily newspaper, the DN300 gives you a high performance, 32-bit virtual memory processor, high-resolution bit map graphics, and an integrated local area network that provides network-wide virtual memory access.

The DN300, latest in the family of DOMAIN processing nodes, supports up to 1.5 million bytes of main memory and 15 concurrent processes of 16 million bytes each, so you can execute large programs. Its 17-inch 1024 x 800 pixel landscape display provides the high-resolution graphics you need for technical applications. The 12 million bit-per-second high speed token-passing network lets you access data anywhere in the network without sacrificing performance. And the DN300 is supported by an optional local hard disk as well as a full complement of network peripherals and gateways.

The DN300 is fully compatible with Apollo's DN400, DN420, and DN600 color computational nodes and supports the same multiprogramming environment, large virtual address space, network communications, multi-window display management, and extensive command library as other DOMAIN nodes. The DN300 connects directly and easily to any new or existing Apollo DOMAIN network. Or it can be used as a standalone workstation. Which means that you can configure the type of network that exactly suits your staff and working environment.

SOFTWARE YOU NEVER THOUGHT YOU'D SEE ON YOUR DESKTOP.

Standard with every DN300 node is AEGIS, the only network-wide virtual memory operating system available today.

Optional software includes ANSI-standard FORTRAN 77, Pascal, C, SIGGRAPH Core Graphics Library, X.25, IBM HASP, IBM 3270, D3M distributed database management system and AUX, a software environment based on UNIX™ System III.

More than 50 available third party application software packages include MSC/NASTRAN and ANSYS, two highly regarded finite element analysis programs; PATRAN-G, an interactive finite element pre- and post-processor; SCRIBE, a text formatting and document production system; and DISSPLA and TELL-A-GRAF, the leading data representation graphics software packages.

NEW DOMAIN SERVER PROCESSOR—A LOW COST WAY TO HANDLE NETWORK PERIPHERALS AND GATEWAYS.

The new DSP80, an intelligent peripheral server that connects to the Apollo DOMAIN network, lets users freely share the same, centrally located peripherals. That relieves individual nodes of the burden of peripheral support. So nodes have more time and more power available to handle specific application-related computing.

And you save money by sharing your expensive peripherals—disks, tape drives, printers and plotters. The DSP80 also provides every user with access to specialized services such as communication gateways, large-scale file storage, and print/plot spooling.

UNIX is a trademark of Bell Laboratories.

USA price $9,933, system builder, quantity 35 DN300 with .5Mb memory, 17-inch graphics display, network interface, and AEGIS operating system.

FIND OUT MORE ABOUT THE DN300 DESKTOP MAINFRAME.

The Domain network gives you low entry cost, high performance, easy and natural incremental growth, reliability, and long-term investment protection. And it gives your technical staff the excitement and satisfaction of working with an innovative, highly productive new tool.

For more information on the Apollo Domain processing system, call Apollo's marketing department at (617) 256-6600, extension 608, or write Apollo Computer Inc., 15 Elizabeth Drive, Chelmsford, MA 01824, attention Marketing Communications.

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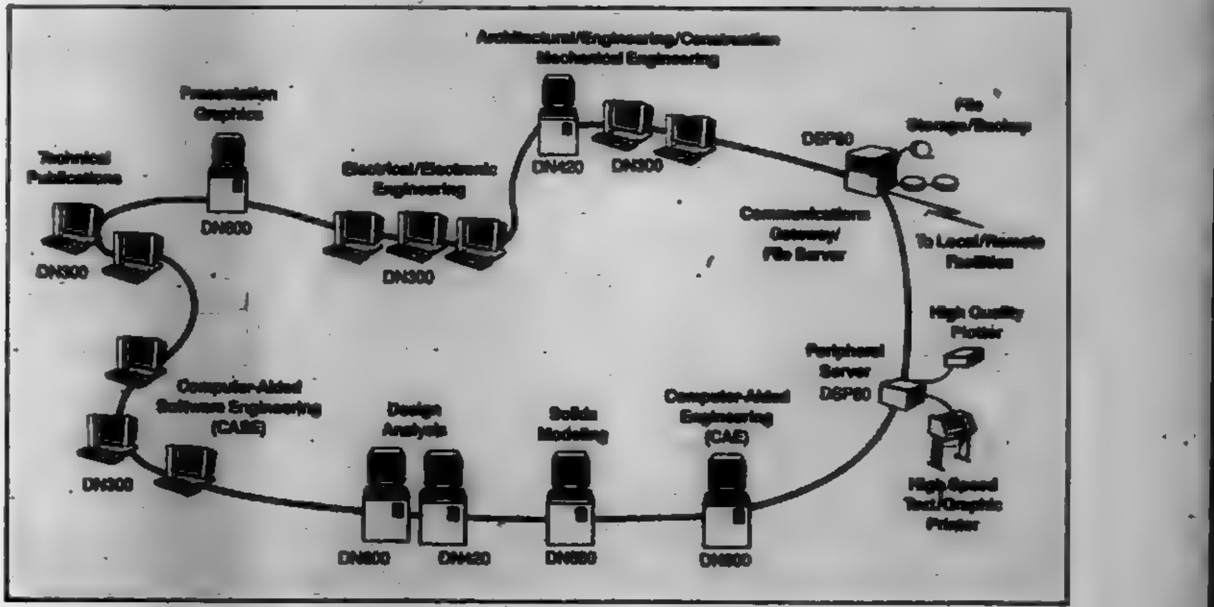
A Domain professional productivity network puts an application specific mainframe on every user's desktop.

The truly exciting aspect of a Domain network is its ideal combination of individual initiative and teamwork. Users get not only the benefits of a high performance, 32-bit computer dedicated to their application, but also retain the benefit of shared resources.

For example, use the DN600 full color graphics computational node for solids modeling, VLSI CAD, finite element analysis, pre- and post-processing, 3-D drafting, and image analysis. Or use it as a full-function CAE workstation . . . The DN420 and DN400 handle the same applications except in monochrome. Use the economical new DN300 desktop mainframe in applications such as computer-aided software engineering, design documentation, high-quality presentation graphics, engineering and manufacturing database management, drafting, and electrical design capture and simulation.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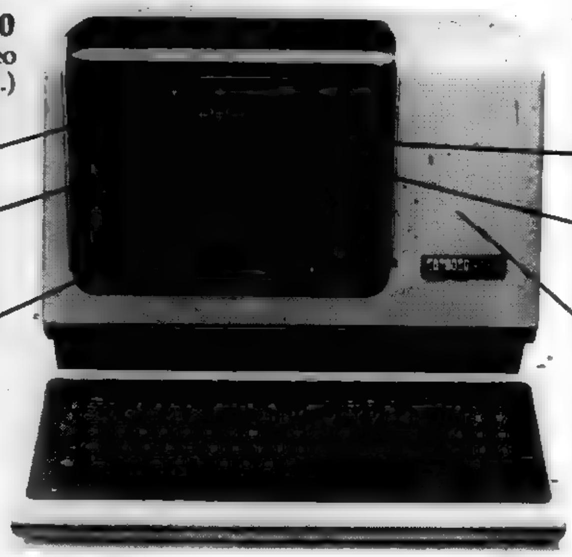
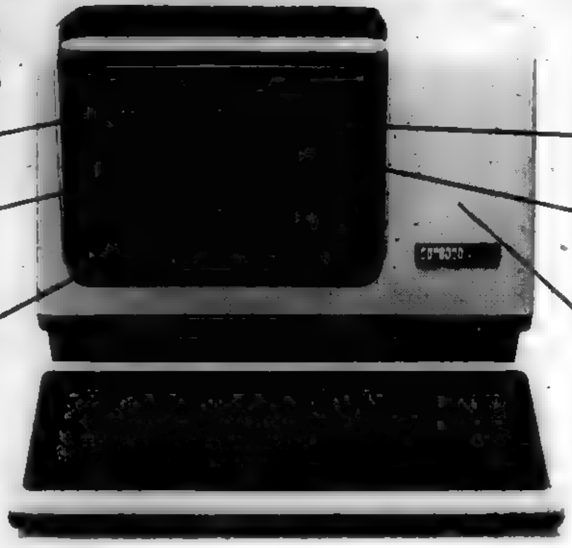
How to get the most popular features of the VT 100 for 30% less.



VT100
(With extra-cost Advanced Video and printer port options installed.)

1. Display 80 or 132 columns, 24 lines deep
2. Smooth scrolling and split-screen viewing
3. Blinking, bold and reverse characters with underlining
4. Double-height and double-width characters
5. Reverse screen
6. Built-in space and extra power for additional options

Buy Digital's VT 102.



VT102
(All features standard at no extra cost.)

1. Display 80 or 132 columns, 24 lines deep
2. Smooth scrolling and split-screen viewing
3. Blinking, bold and reverse characters with underlining
4. Double-height and double-width characters
5. Reverse screen
6. Five full- and half-duplex protocols

Surprise. Digital's VT102 terminal has all the features and quality that have made the VT100 the industry standard. So what's the difference? The VT102 is designed for people who don't need the extra space or power for expansion and add-ons, which include the graphics and personal computing options. And not getting that expansion capability can save you over 30% on the price. So if you don't need it, why pay for it? Check out the VT102 instead.

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Two Programming Modes Added

Report Writer Enhanced

GRANADA HILLS, Calif. — Dylakor has announced Release 3.0 of DYL-280, an English-language report writer, utility and information management system running under IBM OS, DOS, CMS and SSX operating systems.

The new release adds two programming modes: structured coding for advanced programmers and user default for inexperienced programmers. The Structured mode supports nested IF statements, DO WHILE, DO UNTIL, and CASE commands as well as all subordinate keywords, a spokesman said.

In addition, the copy facility of DYL-280 now supports Cobol definitions, enabling definitions and working storage descriptions to be copied directly into the program without recoding. The release allows data names up to 50 characters. Integer, decimal and negative exponentiation is now supported.

Other features include automatic label generation, support for numeric tag names and additional communications region support for DOS/VS and DOS/VSE.

The package costs $1,680/year on a three-year lease from 17418 Chatsworth St., P.O. Box 3010, Granada Hills, Calif. 91344.

Clist Interface Updated for SAS

WETHERSFIELD, Conn. — Northeast Utilities has released Version 2.0 of its SPF/SAS Clist interface. This is a panel system written in IBM's TSO and System Productivity Facility (SPF) Dialog Manager designed to increase productivity for users of SAS Institute, Inc.'s Statistical Analysis System (SAS).

The SPF/SAS Clist consists of a main panel screen and an output processor. The first panel reportedly allows file and data set specification of the SAS program, SAS input or output files, SAS data bases, SAS options and, optionally, SAS/Graph peripherals. The panel is said to handle all allocations and calls to SAS. The second panel is designed to allow users to reedit and rerun a job with single keystrokes.

The package includes the on-line SAS software as well as a batch interface, and the systems are delivered with all panels, Clists, SPF skeletons, messages, documentation and installation instructions, the vendor said.

The SPF/SAS Clist is priced at $250, including postage and magnetic tape costs. Full documentation is available at no charge. Northeast Utilities can be reached through Cary Prague, 176 Cumberland Ave., Wethersfield, Conn. 06109.

JOL Language Gets Enhanced

SACRAMENTO, Calif. — Software Module Marketing has announced that Release 3.4 of its Job Organization Language (JOL) command language for IBM and plug-compatible OS systems includes an enhanced scheduling capability.

The scheduling feature reportedly enables users to create job networks in both programming and data center environments and provides increased capabilities to existing JCL procedures. In addition, JOL may be used as a conversion aid for IBM DOS-to-OS conversions.

The MFT, MVT and VS1 versions of JOL are priced at $50,000 for one CPU, and the MVS version is priced at $60,000 for one CPU. Multi-CPU and multisite discounts are available, and additional discounts are available for VM/CMS sites.

The vendor is located at Crocker Bank Building/Penthouse, 1007 Seventh St., Sacramento, Calif. 95814.

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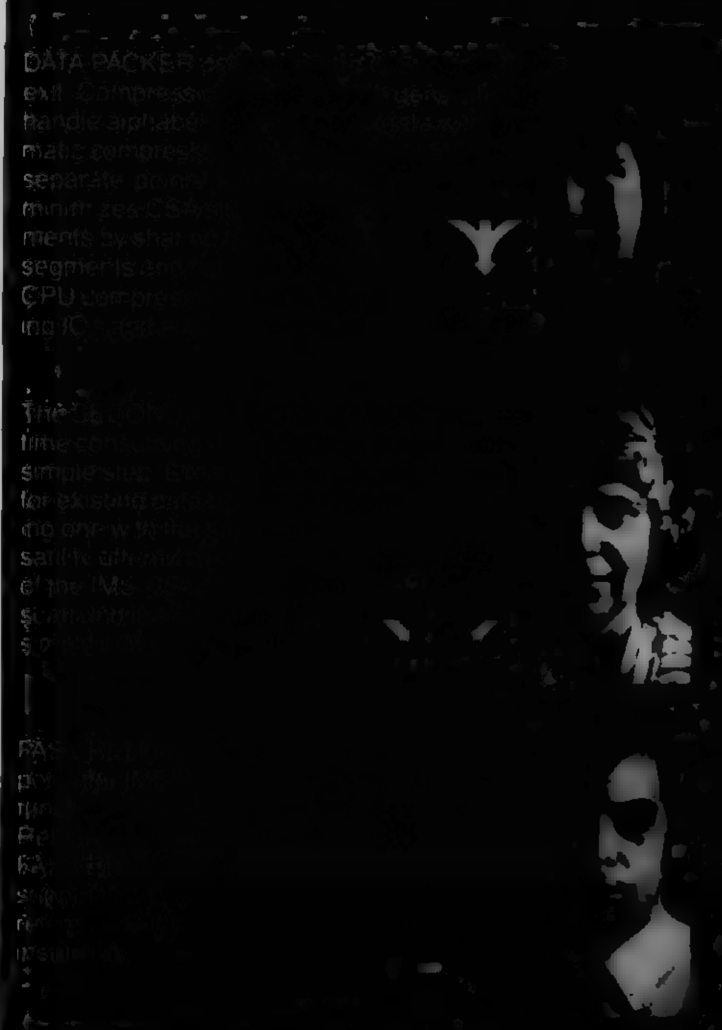

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Implementation of Mumps Out

BOSTON — An implementation of the Ansi-standard Mumps language for Digital Equipment Corp. systems ranging from the Professional 300 up to the VAX-11/780 has been introduced by Intersystems Corp.

Called Intersystems M/VX, the Mumps package includes a computer language, a data base system and utilities designed to facilitate application development. M/VS runs under the DEC VMS operating system, providing the facilities of this operating system as well as the ability to run several languages on the same CPU, the vendor explained.

M/VX is said to take advantage of the expanded memory features of VMS, functioning as a partially compiled language while retaining the interactive programming environment of an interpreter, the vendor said.

Mumps/PC300, the version for the DEC Professional 300, consists of the Mumps language, an integrated data base system and a set of utilities. Mumps/PC300 is said to be a complete implementation of the Mumps language.

The price of Intersystems' Mumps implementation on the various size DEC systems it supports ranges from $595 to $19,500. This is dependent upon the configuration and the number of users supported. The vendor is located at 210 Commercial St., Boston, Mass. 02109.

Control Language Program Added to Trisys Series

SHREWSBURY, Mass. — Trisys, Inc. has announced the addition of the Control Language Analysis program, said to eliminate the error-prone task of updating by hand, to their series of IBM System/38 conversion and operation tools.

The program reportedly performs a complete analysis of the installation's control language and creates a series of reports that show the relationships among the files, programs and procedures in the applications software and between applications software and the IBM utilities, according to a vendor spokesman.

The reports show where all files are created, used and updated; when events occur in a job stream; where and when control language programs call other control language, RPG and Cobol programs, the vendor said.

The license fee for the Control Lanaguage Analysis program is $750. More information is available from Trisys, which can be reached through P.O. Box 274, Shrewsbury, Mass. 01545.

Aids Target Univac 80

BLUE BELL, Pa. — Sperry Univac will provide transition aids to users converting applications from IBM System/34 computers to the Univac System 80.

The products include a library transcriber, data utility, operator control language converter, screen and data description converter, conversion guide, compatible RPG-II auto report, compatible sort, RPG-II compatibility, editor and general editor enhancements, screen format services enhancements and menu services.

The aids are free of charge to System 80 users from Univac, P.O. Box 500, Blue Bell, Pa. 19424.

CPG Offers 'SAM,' 'Fred'

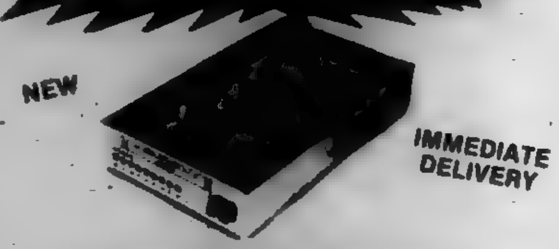
PAOLI, Pa. — Custom Programming Group, Inc. (CPG) has unveiled two systems that run on Four Phase Computer Systems, Inc. minicomputers, the System for Archival Management (SAM) and the Fund Raising and Expansion Development (Fred).

SAM is a companion product for Four Phase's Foreword word processing users. It reportedly provides for the automatic moving of on-line documents to off-line storage with management reports of document location and last use.

Fred is a system for maintaining lists of donors and organizations that contribute time and money to institutions such as hospitals. It also provides ad hoc reports and accounting functions.

Both systems were written using Ansi Cobol 74 to run under Four Phase's MFE operating environment.

CPG will provide the services of installation, customization, interface to other systems and training. The price for SAM is $2,500, with a $250/mo license fee. Fred costs $6,000, with a $350/mo license fee. CPG is located at 1800 E. Lancaster Ave., Paoli, Pa. 19301.



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Quality Assurance Packages Out for HP 1000

PALO ALTO, Calif. — Hewlett-Packard Co. has announced eight quality assurance software packages for HP 1000 series computers. The packages were developed by Hansford Data Systems, Inc. of Rochester, N.Y.

Calibration is a calibration-scheduling system for gauges and test instruments.

Instruction Management provides on-line storage of instructions for receiving, sampling, inspection, assembly, calibration and other manufacturing functions.

Incoming Quality Management is a receiving-inspection, material-status and control system that offers master identification, status and historical information for each lot number.

Process Analysis provides numeric and graphics analytical tools for statistical quality control areas. It allows use of control charts, descriptive statistics or true-position analysis techniques for variables data.

Vendor Rating adds rating-system capabilities to the Incoming Quality Management package.

Production Quality Management allows on-line storage and data management capabilities for variables data.

Coordinate Measuring Machine provides on-line data collection, data storage and data management capabilities for part measurement data collection.

Acceptance Sampling designs and analyzes lot-by-lot single-sampling plans for attributes, the vendor spokesman said.

Prices range from $3,000 to $10,000 per package.

The company is located at 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Release 2.0 for IBM MVS Added to 'Sysout' System

SHERMAN OAKS, Calif. — Essential Software has added Release 2.0 for the IBM MVS operating system to its Sysout Archival and Retrieval (SAR) system.

Release 2.0 of SAR adds several features including a master Vsam directory of all archived Sysout, an option to generate and submit JCL to load archived Sysout from tape to IBM spool disk pack for printing under or subsequent viewing under IBM's TSO/SPF, maintenance of complete Sysout attributes in the directory and archival selection by forms name.

SAR, including one year of maintenance and support, is priced at $5,000. Essential Software is located at 14959 Jadestone Drive, Sherman Oaks, Calif. 91403.

NCR Users Get Finance Packages

FORT LAUDERDALE, Fla. — Commercial Data Corp. has announced two accounting software packages for users of NCR Corp. V-8400, V-8500 and V-8600 series computers.

The firm's Financial Reporting System (FRS) is said to handle actual and budget data, current-year period balances and up to 36 periods of history.

The chart of accounts reportedly is completely controlled by the user. FRS allows posting to any period, the vendor spokesman for the firm explained.

Like FRS, the Accounts Payable (AP) package offers multicompany capabilities.

This package is also said to provide extensive user-defined editing and processing options, according to the vendor.

FRS and AP each range in price from $6,000 to $10,000.

Commercial Data Corp. is located at 5100 N.W. 9th Ave., Fort Lauderdale, Fla. 33309.

Programs Out For System/34

JACKSON, Miss. — Executive Financial Software (EFS) Systems, a division of Mockbee, Edwards & Associates, has announced a set of programs for the IBM System/34 said to permit the user to perform a variety of financial calculations in an interactive format.

The set of programs, also called EFS, reportedly includes 23 separate functions such as investment cash flow analysis, present and future value calculations, simple and compound interest calculations and depreciation and amortization schedules.

It also includes a four-function calculator, a high-speed adding machine and a perpetual calendar.

A 200-page handbook is also provided.

A one-time license fee costs $150 from EFS Systems through P.O. Box 22865, Jackson, Miss. 39205.

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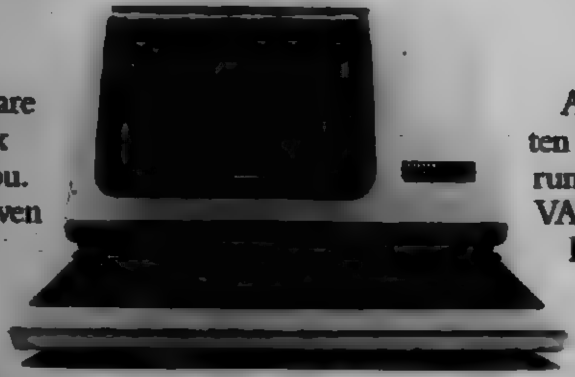

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HP Pricing Program Debuts

PALO ALTO, Calif. — Hewlett-Packard Co. has announced a Value-Added System Supplier program intended to slash prices on multiple copies of its application software products for both volume end users and OEMs.

For example, a volume end user purchasing HP's electronic mail software for the HP 3000 series will pay $10,000 for the first copy and $5,390 to $7,000 for the second through fifth copies. The vendor noted that this depends on the customer's level of business with HP during the purchase contract year.

The sixth through the fifteenth HP Mail packages will be priced between $3,850 and $5,000 each, with the price lowered to between $1,924 and $2,500 for the sixteenth and additional copies.

The new HP software pricing program became effective on Feb. 1 for all HP software products priced above $1,000 (U.S. list). Further information can be obtained from HP at 3000 Hanover St., Palo Alto, Calif. 94304.

SPSS, DEC Offer Software Linkup

CHICAGO — SPSS, Inc. and Digital Equipment Corp. have announced the availability of a new software interface that links the SPSS batch system with DEC's VAX-11 Datatrieve, a high-level data manipulation facility.

The new interface, which completes Release 9.2+ of SPSS software, reportedly enables interaction between SPSS — a tool for information analysis, summarization and display — and VAX-11 Datatrieve, which provides VAX-11 system users with the ability to organize, maintain, retrieve and manipulate data.

SPSS/VAX-11 users reportedly will have the ability to pass data through the interface from the VAX-11 data base management system (DBMS) or records management system (RMS) record files to SPSS' batch system, graphics and SCSS conversational statistical functions.

Using the interface, SPSS can pass descriptions of VAX-11 DBMS and RMS data stored in the VAX-11 Common Data Dictionary to SCSS and SPSS graphics.

SPSS products that run on DEC's VAX-11, PDP-11, Decsystem-10 and 20 systems are marketed cooperatively by DEC and SPSS. However, the SPSS batch system with the SPSS/VAX-11 Datatrieve interface is available from SPSS for an annual license fee of $4,000. More information is available from SPSS, 444 N. Michigan Ave., Chicago, Ill. 60611.

Pascal Compiler Fits MV Series

COLUMBIA, Md. — Rhintek, Inc. has announced a Pascal compiler for the Data General Corp. MV/8000, MV/6000 and MV/4000 series processors.

The compiler includes several extensions including external procedures, random-access I/O and source level %INCLUDE. The package will compile and run Pascal programs on any MV family processor under the APS/VS operating system. The compiler can also be configured to operate on 16-bit DG Nova processors under the APS or Rdos operating systems, a spokesman for the vendor said.

The compiler and routine library costs $4,500 for an AOS/VS system, the vendor said. Rhintek can be reached through P.O. Box 220, Columbia, Md. 21045.

UIS Enhances Apex Service

KANSAS CITY, Mo. — United Information Services, Inc. (UIS) has announced an enhancement of its Control Data Corp. Cyber-based Apex service. The service now allows users to execute batch control statements and batch products during an interactive time-sharing session, a spokeswoman said.

Apex clients can now interactively access computers, utilities and software products that were previously accessible only through batch. UIS maintains major data centers in Kansas City and Pittsburgh, Pa., which house CDC, Cray Research, Inc., Digital Equipment Corp. and IBM mainframe configurations. Individual programs and extended solution packages are offered within the disciplines of finance, engineering, energy, distribution and manufacturing.

Service is available in two options. Option A base connect charges are $10.50/hour with terminal I/O costing 21 cents per 1,000 characters. Service unit charges are 31 cents per service unit.

Option B base connect charges are $15.50/hour with terminal I/O costing 27 cents per 1,000 characters and a 22 cents charge per service unit. The vendor can be contacted through P.O. Box 8551, Kansas City, Mo. 64114.

'Datacalc/38' Offered By Fusion Products

MILL VALLEY, Calif. — Fusion Products International has announced Datacalc/38, a financial modeling and electronic spreadsheet system written in RPG III for IBM's System/38. It is said to allow users to create large three-dimensional models with 97 lateral columns, 10,000 vertical rows and 9,999 spreadsheets per file.

When directly interfaced to the System/38's Data Description Specification, any Datacalc/38 spreadsheet reportedly can be updated automatically. Features include real-time extraction, multilevel menu command console, full spreadsheet consolidations, the 42 Single Key Formula Library, Help screens and a hands-on tutorial program.

Datacalc/38 costs $4,500 from 317 Miller Ave., Mill Valley, Calif. 94941.

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[1] Documentation available from Triangle Software Company

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Micro Notes

Window is the name of a full-screen text editor designed for IBM Personal Computer users. Editing functions include scroll, lock, insert, delete, page-up and page-down capabilities. The software diskette costs $150 and is available from Intellect Associates, Inc. through P.O. Box 365, Holbrook, N.Y. 11741.

Satellite Software International offers two new products for the IBM Personal Computer. **Wordperfect** is a word processing package featuring merge, math, columns and printer support. It costs $495. **SSI Forth** is the company's version of the Forth programming language, which sells for $95. The vendor is based at 288 W. Center St., Orem, Utah 84057.

CMA Micro Computer has announced the release of a new Basic teaching and IBM DOS training program for the IBM Personal Computer. **The Teach PC** runs on IBM's Personal Computer and leads the user through Basic, utilities and various fundamental computer operations. It costs $149.95, the vendor said from 55722 Santa Fe Trail, Yucca Valley, Calif. 92284.

Three programs for use with the Profile Plus electronic filing program for the TRS-80 Model II microcomputer were introduced by Radio Shack. **Profile Prosort**, available for $149, was described by the vendor as a high-speed indexing program that permits sorting and selecting records from any segment of a file. **Profile Forms**, a print program that prints one report per sheet on each item in the file, is priced at $125. **Profile Archive**, which allows the user to purge inactive records from any file in Profile Plus, is available for $49. The vendor is located at 1800 One Tandy Center, Fort Worth, Texas 76102.

Technical Systems Consultants, Inc. has released a native code Cobol compiler for use under its Motorola, Inc. microprocessor-based Uniflex operating system. A single-CPU license for the complete **6809 Uniflex** Cobol package costs $750, which includes one year of maintenance and a limited warranty, the vendor said from 111 Providence Road, Chapel Hill, N.C. 27514.

Cullinet Opens Center

WESTWOOD, Mass. — Cullinet Software, Inc. has opened its National Education Center at 30 Speen St. in Framingham, Mass. The center will provide hands-on training on Cullinet products as well as for such functions as data base administration, data communications administration, applications design and applications programming.

The center includes a computer laboratory with the entire base of Cullinet products installed. The laboratory will provide compatible environments for students familiar with different operating systems, including OS, MVS and DOS/VS.

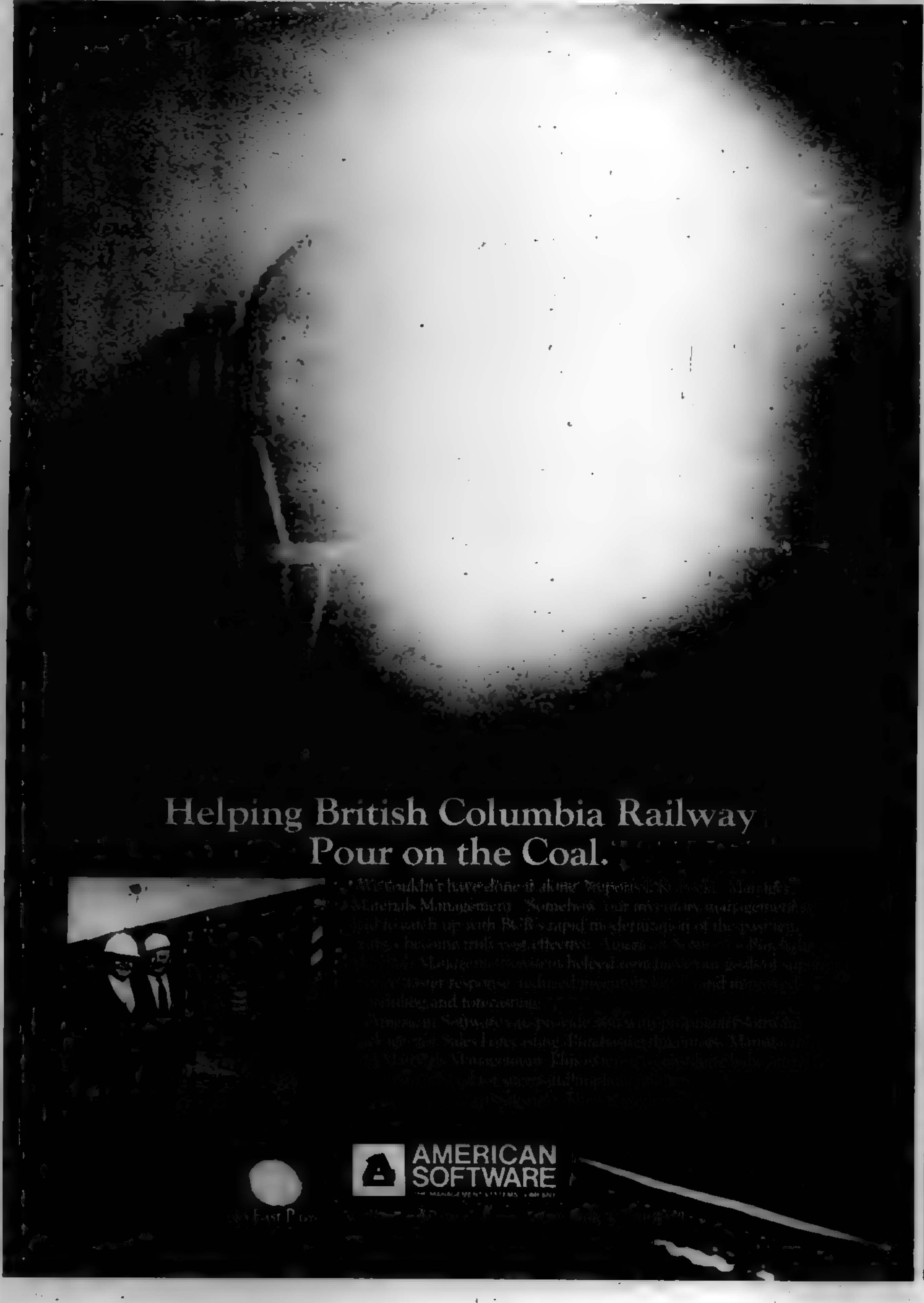
Cullinet can be contacted at 400 Blue Hill Drive, Westwood, Mass. 02090.

Package Out For Board Testers

CONCORD, Mass. — Genrad, Inc. has announced a program development package for Genrad's 227X line of circuit board testers used in conjunction with Digital Equipment Corp.'s VAX-11 series processors.

Called VAX/227X, the package is compatible with 227X Release 7 software. Features include the ability to create a complete test program including circuit analysis and use of component libraries. The package is menu driven and can be used in multitasking applications.

The VAX/227X program will run on any VAX-11 processor. The package costs about $25,000, the vendor said from 300 Baker Ave., Concord, Mass. 01742.



Cableshare CPU Now Compatible With RSX-11M

LONDON, Ontario — Cableshare, Inc. has announced that its LSI-X.25 front-end processor can now be used with Digital Equipment Corp.'s RSX-11M V4.0 and RSX-11M Plus V2.0 operating systems.

Designed for operation with DEC PDP-11 and VAX series processors, the LSI-X.25 can tie DEC processors to public and private packet switched networks. The unit is equipped with a direct memory interface to a host processor and eliminates the need for communications port hardware. All three levels of the X.25 communications protocol are supported, the vendor said.

The LSI-X.25 costs $13,250, a spokesman for the vendor said through P.O. Box 5880, 20 Enterprise Drive, London, Ontario N6A 4L6.

Scott Systems Announces Intelligent Terminal Line

MARLBOROUGH, Mass. — Scott Systems, Inc. has unveiled Access, a multifunctional intelligent terminal product line based on Intel Corp.'s 8088 microprocessor and said to embrace a range of capabilities from simple terminal emulation to advanced local- and wide-area network systems.

Principal components of the product line reportedly include clustered and stand-alone terminals, an extensive library of emulators and applications programs and supporting software tools. The local-area network software operates under the direction of the Scott Environment Management System.

The minimum Access terminal starts with 64K bytes of memory expandable to 1M byte, the vendor said. The product line utilizes an industry-standard bus architecture. Each terminal is configured to include two microprocessors: one to execute the applications program and the other to support network communications.

The Access product line is functionally divided into four dimensions and the equipment and software migrate through each dimension:

- Dimension I — The Access stand-alone or cluster systems reportedly will emulate a wide range of popular terminals including IBM's 3270/Binary Synchronous Control, 3270/Synchronous Data Link Control (SDLC) and Systems Network Architecture/SDLC; Digital Equipment Corp. VT-100; Burroughs Corp. TD 830; and the Sperry Univac U200.
- Dimension II — The Access system is said to integrate all the necessary hardware and software to act as a stand-alone or clustered independent workstation system, including Access disk drives and up to 1M byte of main memory.

Each Access workstation can control a wide range of peripherals. Disk units enable the Access stand-alone terminal to function as a personal computer, accord-

(Continued on Page 48)

Supports Non-HP Terminals

Tymlabs Aid Targets HP V/3000

AUSTIN, Texas — Tymlabs Corp. has introduced a communications software package said to allow the Hewlett-Packard Co. V/3000 Form Facility package to run on any CRT terminal.

Preview allows the V/3000 — designed to run on Hewlett-Packard display terminals in block mode — to run under character mode on less expensive terminals, a vendor spokesman claimed. Heavy I/O demands common to block mode are said to be reduced in character mode.

Among the terminals supported by Preview are the Lear Siegler, Inc. ADM 3A and ADM 5; Tele-Video Inc. 925, 950 and 970; and IBM 3101.

The package costs $3,500 with an annual support fee of $700. It is available from Tymlabs at 211 E. 7th St., Austin, Texas 78701.

Protocol Conversion Package Provides IBM 3278 Emulation

OTTAWA — Aztec Computing, Inc. has announced protocol conversion software said to link microcomputers and asynchronous terminals to IBM mainframe computers and have them appear as local IBM 3278 terminals.

The SIM3278 package reportedly provides for the full-screen functions of an IBM 3278, while using an inexpensive Ascii video display terminal, without any hardware or operating system modifications or additions. Up to 255 terminals per simulator and over 30 different terminal types can be supported by the emulation system, which uses IBM 370 assembler language.

Also, existing 3278 full-screen software can be used by both micros and dumb terminals without modifications to the VM/SP operating system, the vendor said.

SIM3278 costs $5,500 per single-CPU license. A 30-day, free demonstration tape is available. Aztec Computing is located at 969 Bronson Ave., Ottawa, Ontario, Canada K1S 4G8.

Autodial Modem Announced

SAN JOSE, Calif. — Anderson Jacobson, Inc. has unveiled an auto-dial modem said to eliminate the need for a telephone set on the data line.

Terminal users may dial direct from any associated terminal keyboard, as well as enter, store and automatically dial up to 10 telephone numbers through simple keyboard commands, according to the vendor.

The AJ 1259-AD is an auto-dial/auto-answer triple modem compatible with the Bell Laboratories 212A and VA 3400 series modems at 1,200 bit/sec and with Bell 103/113 modems at 300 bit/sec.

The microprocessor-controlled unit is Federal Communications Commission approved for direct connection to the switched telephone network via RJ-11C modular jacks or RJ-41S and RJ-45S data jacks. The purchase price is $875 and lease price is $60/mo from 521 Charcot Ave., San Jose, Calif. 95131.

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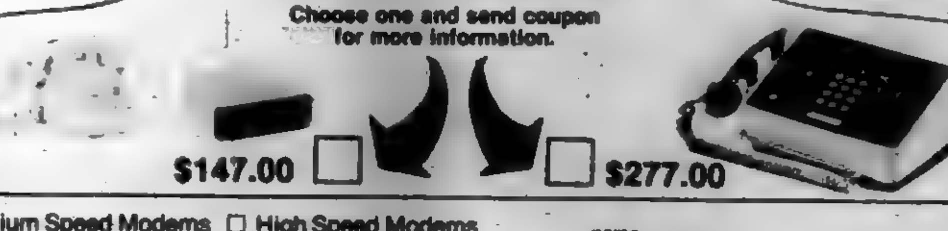

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Field Test System Debuts

LINCOLN, R.I. — International Data Sciences, Inc. (IDS) has announced a system for uploading and downloading data communications test routines between a host site and field locations. The software was designed to operate with the IDS Hawk Model 4030 Programmable Datacomm Tester and is offered in a compact plug-in read-only memory module, ROM-PAC.

IDS also announced the addition of a portable, self-contained data test set to its Range Rider product line of data communications test equipment.

The Model 4030 is said to be a lightweight field service data communications test instrument featuring 51 resident instructions for developing user-unique test routines of up to 100 steps each. ROM-PACS are now available for X.21 test routines and IBM's Binary Synchronous Communications and Systems Network Architecture.

The Model 1320 Range Rider data test set was designed to analyze the error rate of any digital transmission network. It reportedly can be used to test synchronous, asynchronous or start/stop character-oriented systems such as time-division multiplexers (TDM). Bit, character and block error rates are determined by transmitting pseudo-random test patterns over the communications channel. Also, a start/stop character can be programmed and transmitted in either a single or continuous format, the vendor said.

The Model 1320 TDM-Modem Test Set is priced at $4,145 from International Data Sciences at 7 Wellington Road, Lincoln, R.I. 02865.

MDB Offers Bus Terminator

ORANGE, Calif. — A removable, pluggable bus terminator with 22-bit addressing is now contained on all backplanes used in Digital Equipment Corp. LSI-11 System Boxes designed by MDB Systems, Inc.

The terminator was formerly available as a separate board option, but has been added to the box design to free a backplane card slot for other optional modules, the vendor explained.

MDB's Basic Chassis and Systems Boxes are available in multiple front and rear configurations and with eight to 32 Q-Bus slots. Base price for a System Box is $1,450 from the firm at 1995 N. Batavia St., Orange, Calif. 92665.

Converter Out For IBM 5520

HOUSTON — IO Corp. has unveiled an IBM 5520-compatible interface that reportedly links the 5520 with an asynchronous device using IBM's Binary Synchronous Communications (BSC) protocol.

The protocol converter reportedly has been sensitized to only pass message data as input by the word processing operators using the 5520. It features an 8K-byte memory, utilizes BSC error checking to ensure data integrity and interfaces a 24K bit/sec BSC line to a 12K bit/sec asynchronous line.

The IO901A interface costs $39.95 and can be leased. IO Corp. is located at 1343 Blalock, Houston, Texas 77055.

System/34s, 38s Get Data Transfer Aid

ST LOUIS — Data Transfers has introduced a communications software package said to allow transmission of data between multiple IBM System/34s and an IBM System/38.

Data-Trans/1 allows the transfer of reports contained in spool queue, data files and punch data. It also maintains a history of files received and sent and files can be sent in transparent mode or block size to 8,196 bytes. It utilizes the Binary Synchronous Communications protocol, a vendor spokesman said.

The package is available for $990, the spokesman said from Data Transfers, P.O. Box 28553, St. Louis, Mo. 63141.

Controller Bows From ETI Micro

DUBLIN, Calif. — ETI Micro has introduced a communications controller said to be Multibus-compatible operating in a multiple board system or as a stand-alone controller.

The 8103 Smart Communications Controller contains two RS-232C ports, two Bell 202 modems, a microprocessor, dual-port random-access memory and two levels of preprocessing firmware. All routines for servicing and handling four separate communications lines simultaneously reside within the on-board preprocessing firmware, a vendor spokesman claimed.

The 8103 is available for a base price of $1,160 from ETI Micro, 6918 Sierra Court, Dublin, Calif. 94568.

Guide Covers Equipment Info

PENNSAUKEN, N.J. — Auerbach Publishers, Inc. has introduced a two-volume guide said to provide current information on the selection of telecommunications equipment and call management.

Designed for telecommunications executives, the "Telephone Equipment Selection Guide" includes "how to" techniques on qualifying vendors, requesting proposals and negotiating contracts. The "Telephone Cost and Call Management" guide allows the user to evaluate his current systems and design, implement and maintain the best system for his company, according to a vendor spokesman.

Individually, the volumes are $180 each; purchased together the price is $320. More information is available from Auerbach Publishers, Inc., 6560 N. Park Drive, Pennsauken, N.J. 08109.

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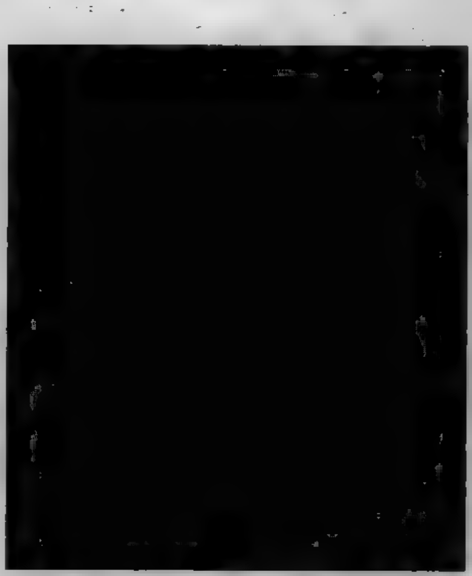

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Local Networking Capability Featured With Intecom PBX

ALLEN, Texas — Intecom, Inc. has integrated local-area networking into its IBX private branch exchange (PBX).

Lanmark is a 512K bit/sec network inherent to the IBX architecture. All communication — voice and data transmission between devices at high and low speeds — takes place with the large 8,192-port IBX Lanmark, the vendor claimed. The family of Lanmark applications is scheduled to be brought out in phases: A Xerox Corp. Ethernet application is available now.

The PBX uses a single-cable plant of twisted-pair cabling to provide voice and data circuit switching plus network packet switching. The list of telephone features includes voice synthesized instructions and least-cost routing. The IBX also interfaces devices with data transmission at up to 10M bit/sec to support the workstation environment, the vendor claimed.

Lanmark costs $500/user interface and $10,000 as a basic option to the IBX. All existing IBXs can be retrofitted to utilize the local-area networking capability, Intecom said from 601 Intecom Drive, Allen, Texas 75002.

AED Cuts Prices On Terminals

SUNNYVALE, Calif. — Advanced Electronics Design, Inc. (AED) has announced a more than 50% price cut for its AED512 and AED767 color graphics terminals.

The AED512 tabletop terminal with eight memory planes now costs $5,995. The AED767, said to be the first display to incorporate antialiasing features into firmware, is now priced at $10,995.

AED's pricing strategy is the result of substantial savings in manufacturing costs as well as an 80% rise in sales during 1982, the vendor said from 440 Potrero Ave., Sunnyvale, Calif. 94086.

Smart Terminals Bow From Scott

(Continued from Page 45)

ing to the vendor.

- Dimension III — Up to 32 Access systems with a maximum 60 workstations are incorporated into a local-area network with each system capable of sharing the resources and communicating within the network.
- Dimension IV — Up to 32 local-area networks are linked into a wide-area network with over 1,000 Access systems communicating independently of the host computer to provide a full range of application support and interface to other networks, electronic mail and internetwork communications.

The network capabilities support a local network via high-speed network interface adapters and a wide-area network via Gateway controllers. Baseband signaling is used with a data transmission rate of 1M bit/sec. The local-area network utilizes coaxial cable up to 5,000 feet in length, the vendor said.

The basic small cluster system including 64K-byte memory, 16K-byte erasable programmable read-only memory, CRT screens and keyboards is priced $2,473/position. Diskette device prices begin at $3,225 for a dual 5¼-in. drive.

Larger clustered configurations start in price from $1,970/position. Maintenance is provided by Scott Systems through a nationwide service organization, the spokesman for the vendor said.

Scott Systems is located at 1 Metropolitan Corporate Center, Marlborough, Mass. 01752.

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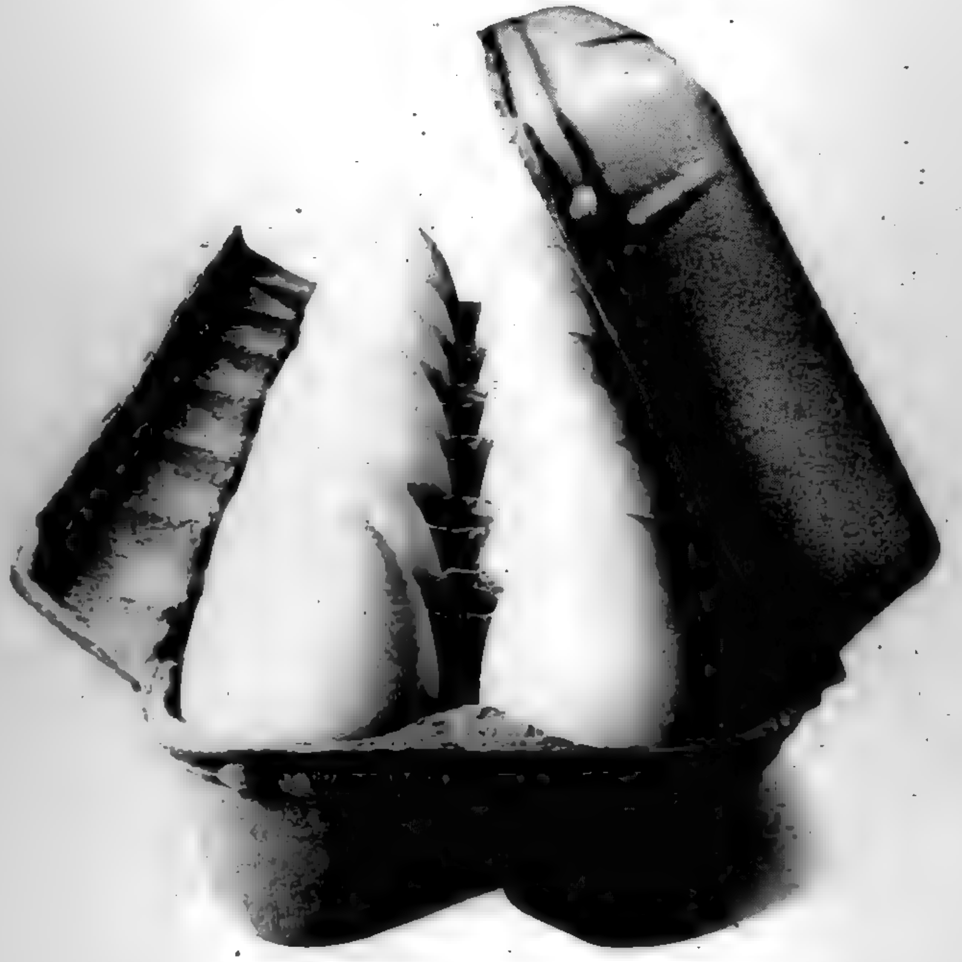

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Tax Breaks On Software

By Jan Lee Ozer

Dear Tax Adviser:

As data processing manager of XYZ Corp., I convinced the financial people to commit substantial resources to developing and acquiring computer software needed to continue experimentation into new product lines. But ever since year-end, I have been getting funny looks from everyone in the accounting department. Apparently our cash position is not as strong as anticipated due to the poor economy. You are my last hope. Do you have any tax miracles that go right to the bottom line?

— Alienated

Dear Tax Adviser:

As my company's management information systems director, I have been asked to submit a proposal to the finance committee for software expenditures for the next three years. My predecessor's pro-

posals were strong on DOS/VS, OS, remote job entry emulators and data base management systems, but weak on anything the committee members could understand. Hence, his budget was always small — ultimately too small for his salary. I would like some tax planning tips to integrate into my proposal. In short, how can I use the tax laws to make the necessary expenditures as inexpensive as possible?

I also bought a personal computer for my own use last year. I use the machine to manage my investment portfolio, to keep track of my tax situation and to help with my company work at night and on weekends. Any tips?

— **Ambitious**

Dear Ambitious and Alienated:

You are not alone. With data processing costs increasing in both dollar amount and as a percentage of the overall corporate budget, managers have a responsibility to consider all facets of finance, including how the tax laws can be used to their advantage.

Several recent developments have created new avenues for tax planning from which your company may benefit. Discussing these ideas with your financial people could lead to immediate savings on your 1982 return.

By including these concepts in your budget proposal, you could lower your company's anticipated out-of-pocket costs.

The recent developments involve two tax credits that may now be available for the cost of developing or acquiring software: the research tax credit, which was enacted by the Economic Recovery Tax Act of 1981 (Erta), and the investment tax credit, which was reinstated in 1971, but only recently made applicable to software. These credits constitute "bonus-like" tax incentives granted by Congress to encourage specific research or investment activities. As with all such tax incentives, the guidelines for the credit are fairly specific and are narrowly interpreted by the Internal Revenue Service.

Research Tax Credit

Erta enacted a tax credit for 25% of qualified incremental research and development expenditures paid or incurred after June 30, 1981, and prior to Jan. 1, 1986. To compute the incremental R&D costs, subtract from current-year costs the greater of actual base period costs or 50% of current-year costs. This limits creditable expenditures to a maximum of 50% of current-year costs, which reduces the 25% credit to a maximum of 12.5% of total expenditures for the year. The credit is further reduced when base period expenditures exceed 50% of current-year costs.

If the base period amount exceeds total current-year costs, then no credit is available.

Erta does not specifically define which software costs constitute R&D expenditures. The IRS recently proposed regulations specifically addressing this issue.

According to the proposed

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regulations, "the term 'research or experimental expenditures' ... includes the programming costs paid or incurred for new or significantly improved computer software. The term does not include costs paid or incurred for the development of software the operational feasibility of which is not seriously in doubt.

"The costs of modifying previously developed computer software programs, such as the costs of adapting an existing program to specific customer needs or the costs of translating an existing program for use with other equipment, do not constitute research or experimental expenditures. Whether software is 'new or significantly improved' will be determined with regard to the computer program itself rather than the end use of the program.

"For example, the costs of developing a program to perform economic analysis which involves only standard or well-known programming techniques are not research or experimental expenditures even if the economic principles embodied in the program are novel. However, if the programming itself involves a significant risk that it cannot be written, the costs of developing the program are research or experimental expenditures regardless of whether the economic principles or formulas embodied in the program are novel," according to the proposed regulations.

The proposed regulations focus on the "operational feasibility" of the software rather than its end use. Unless the developmental process involves a significant risk of failure, the software costs would not fall within the IRS guidelines. This apparently excludes all software systems that are commercially available, even if installation would involve significant customization or modification.

Pure research into new programming techniques, such as research performed by software manufacturers, should qualify if it is within the other provisions of the credit. Software designed for a specific user function should qualify if new programming principles are used and if there is significant risk that the program will fail.

The definitive sections of the proposed regulations fall short in two areas. First, under the proposed guidelines, a program that is ultimately successful is almost by definition excluded, since its success may negate the probability of failure actually involved. Second, the proposed regulations would exclude software used in other qualifying R&D activities.

If XYZ Drug Corp. developed a simple program to aid in research of new drugs, the cost of the program would not qualify, even though virtually all other research expenses would. This seems excessively restrictive in view of the intended incentive purpose of the R&D credit.

Some expenditures incident to installing and implementing a software package may also be creditable under the research tax credit provisions. Such costs would include 100% of in-house expenditures for staff and supplies and 65% of outside consulting services. The sum could prove considerable during the process of installing a software system. Presumably, however, such costs would not be creditable unless the underlying software qualified as R&D. So, the restrictive provisions have a cumulative effect by limiting the credit on not only the software costs, but on all costs associated with its implementation.

The regulations will not become final until after public commentary, and hearings will be held in late March. Because of the restrictive nature of the proposed regulations, a critical response is expected [see "Software R&D Tax Credit Rocky," CW, Feb. 21]. Furthermore, if the regulations were to be challenged in court after their adoption, their validity might not be resolved for years. However, until withdrawn, modified or struck down by a court, they represent the IRS position with respect to software costs that qualify for the credit.

As would be expected, there is significant gray area between software that clearly qualifies and software that clearly does not. The proposed regulations merely provide an outline of the factors to be used by the

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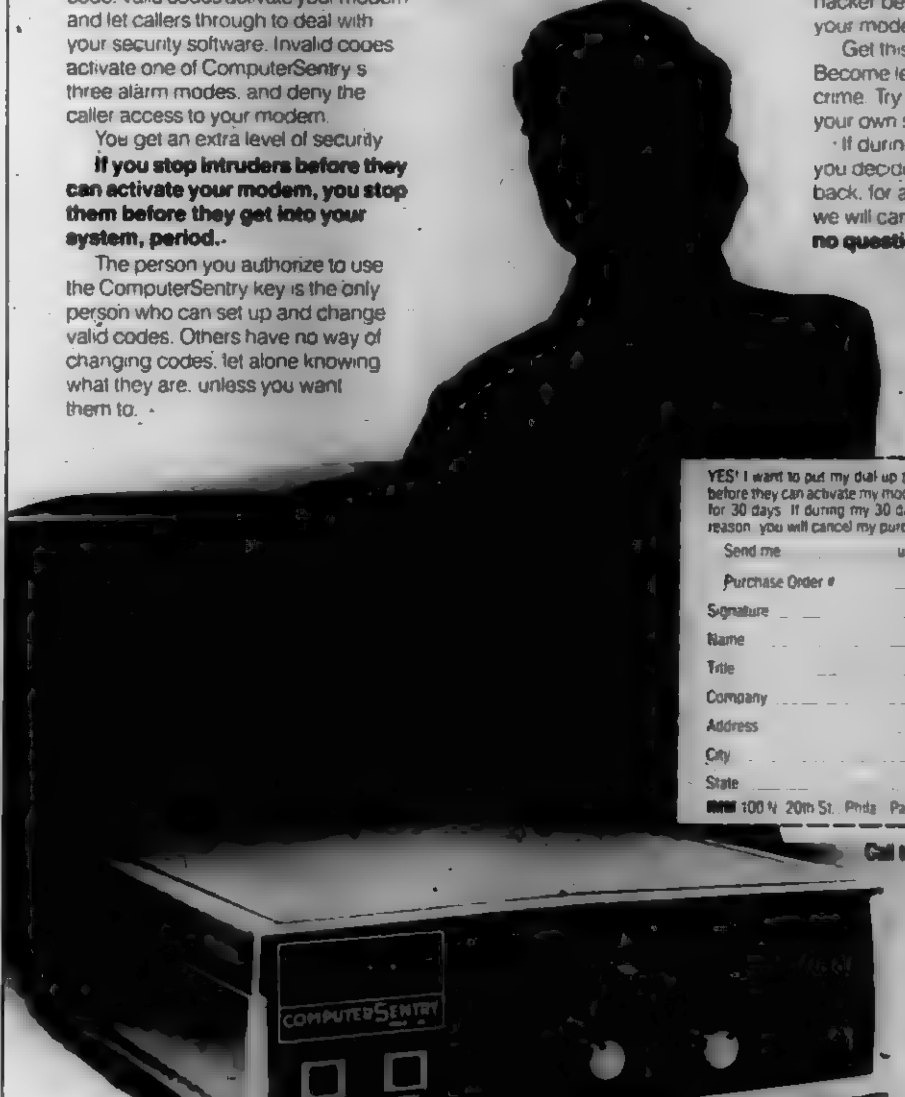

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Assume a $100,000 expenditure for software in the year ended Dec. 31, 1982 and that the expenditure qualifies for the research and development credit. Assume also that there were no research and development expenditures in the prior year. The credit would be calculated as follows:

Qualified research and development expenditures 65% of $100,000	$65,000
Base period expenditures (greater of actual or 50% of current costs)	32,500
Excess of current over base period	32,500
Credit percentage	X 25%
Research and development credit	$8,125
Effective credit rate 8,125/100,000	8.125%

Figure 1. Calculating the Research and Development Credit

Research and Development Costs	Option I	Option II	Option III
12/31/81	$ 25,000		$ 75,000
12/31/82	125,000		75,000
12/31/82		$150,000	
Total expenditures	$150,000	$150,000	$150,000
Total research and development credit	$ 12,188	$ 12,188	$ 6,094
Investment tax credit	$ 12,000.	$ 12,000	$ 12,000

Figure 3. Assume no R&D software costs incurred in 1980.

IRS in distinguishing creditable software. Knowledge of these factors will help identify software that may qualify. for the research tax credit. Once that software is identified, discussions with in-house financial or tax personnel should be instituted to determine whether the credit is applicable. If so; the company should identify and account for other creditable expenses incident to the software development in order to ensure that the company obtains the maximum allowable credit.

Investment Tax Credit

The investment tax credit is a credit on investment in qualified personal property. Unlike the research tax credit, the investment tax credit is not based on incremental expenditures, but is calculated yearly without regard to expenditures in previous years.

Traditionally, the investment tax credit has only been available for software that was purchased with the original hardware — and only if the invoice did not state the software costs separately. All internally developed software and all sofware purchased after the hardware was not considered property eligible for the investment tax credit.

The Fifth Circuit Court's decision in *Texas Instruments, Inc. vs. U.S.* cast some favorable light in this area. In that case, the taxpayer sought to capitalize the costs of processing seismic data onto computer tapes for producing maps of undersea terrain. The capitalized costs included labor, materials and other expenditures, as well as the purchase price of the magnetic tapes. TI claimed investment tax credit on the total amount capitalized. The IRS asserted that the costs of collecting and processing the data were an investment in intangible property and that the investment tax credit was limited to the minimal cost of the tape.

The court ruled that the total capitalized cost was eligible for investment tax credit. While recognizing that the intrinsic value of the tapes related to the information contained thereon, the court reasoned that the information had no value unless manifested in some tangible, useful form. The court concluded, therefore, that the tangible and intangible components of the tapes could not be separated and that the entire cost was eligible for investment tax credit.

Like the magnetic tapes in the TI case, software has no commercial application without physical manifestation for input into the computer. For this reason, many tax professionals have been advising their clients to claim the investment tax credit on both purchased and internally developed software.

Purchased Software

As discussed earlier, most purchases of packaged software will not

Research and Development Software Expenditures		Investment Credit[1]	Research Tax Credit
Year ended 12/31/81	$100,000	$ 8,000	$ 8,125
Year ended 12/31/82	100,000	8,000	8,125
Year ended 12/31/83	100,000	8,000	5,417
Year ended 12/31/84	100,000	8,000	Nil
Year ended 12/31/85	100,000	8,000	Nil
Total Credits		$40,000	$21,667

1. Assume election was made in all years to reduce the investment tax credit by 2%.

Figure 2

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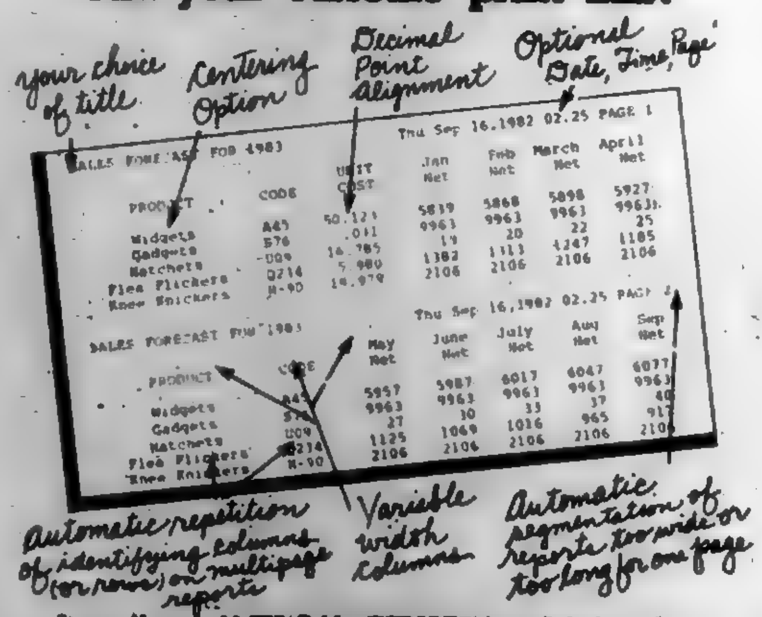
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qualify for the R&D credit. However, investment tax credit should be claimed for software purchases, whether they were made separately or with hardware.

Contract Expenditures

Contract expenditures for software programs specifically designed for a user's needs should qualify for the R&D credit if the qualifications discussed previously are met. However, only 65% of contract research expenses, or fees paid to third parties for R&D, is treated as a qualified research expenditure. When coupled with the definition of minimum base period expenditures, this limits the effective credit to a maximum of 8.125% (see Figure 1).

To compare this result with the investment tax credit available on the same expenditure, the provisions of the Tax Equity and Fiscal Responsibility Act of 1982 (Tefra) must first be examined. Under Tefra, the purchaser of property eligible for investment tax credit has two options. Using the general rule, a 10% credit applies, but the depreciable basis of the property must be reduced by 50% of the investment tax credit taken. This, of course, reduces the tax benefits to be derived from the depreciation of the property.

If this general rule were followed in the example in Figure 1, the investment tax credit would be $10,000 and the remaining depreciable basis of the property would be $95,000. The alternative, which results in more overall tax savings, is to reduce the credit by 2%. This would result in an investment tax credit of $8,000 and a depreciable basis of $100,000.

If that choice is made, the absolute credits for purchased software are roughly equivalent (compare the 8.125% R&D credit with true 8% investment tax credit). Two factors, the flow of software expenditures and the extent of in-house research and development expenses, must be analyzed to determine which route will yield the maximum tax saving.

While the investment tax credit is available each year without reference to prior year expenditures, the research tax credit is based on incremental expenditures only.

For this reason, if a company anticipates a steady flow of software expenditures over several years, the investment tax credit yields more favorable results (see Figure 2).

If contract software development costs can be incurred in one year, or in yearly increments of 100% of base period costs, maximum use of the research tax credit can be attained (see Figure 3).

In planning when to make these expenditures, users must consider the prepayment provisions contained in Erta. These provisions allow the IRS to allocate contract expenditures to the period during which the services were performed, thus frustrating a prepayment scheme designed to maximize the research tax credit.

The second factor that must be analyzed is in-house expenditures relating to soft-

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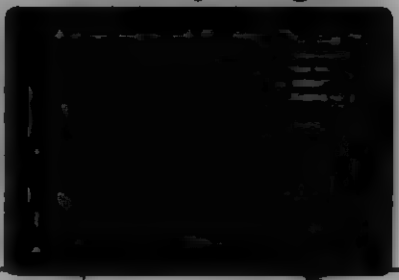

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Assume that $100,000 is spent for internal software development in the year ended Dec. 31, 1980 and all other years shown. This example traces the tax benefits of the $100,000 expenditure in the year ended Dec. 31, 1981, comparing the results obtained by expensing or capitalizing the costs. Assume that tax savings were invested in the year following realization. Results would be identical for expenditures in all other years.

Year	Tax Benefits[3]	
	Expense[1]	Capitalize[2]
Dec. 31, 1981	$46,000	$16,555
Dec. 31, 1982	Nil	9,614
Dec. 31, 1983	Nil	9,177
Dec. 31, 1984	Nil	9,177
Dec. 31, 1985	Nil	9,177
Total tax savings	$46,000	$53,700
Interest earned[4]	$21,349	$13,710
Total benefit	$67,349	$67,410

1. Assume no R&D credit due to lack of incremental qualifying expenditures.
2. Assume that property was depreciated using five-year ACRS and that the depreciable base was reduced by 5% of the investment tax credit claimed.
3. Assume 46% rate in all years.
4. Assume 10% yield.

Figure 4

ware development. As noted above, installing a computer can involve a significant amount of staff time, and it is not unusual for a company to hire several people to help. Assuming the underlying software qualifies as R&D, these costs would also qualify in full for the R&D credit.

To summarize, some software purchases will not qualify for the new R&D credit, but support exists for taking the investment tax credit on them.

For software purchases that qualify for both credits, the flow of those purchases and extent of in-house expenditures should be estimated. Once these figures are obtained, the taxpayer should forecast the total credits under each alternative before choosing characterization as personal property or R&D expenses.

Internally Developed Software

Both credits discussed above should be available for internally developed software. However, if the software costs are claimed as R&D expenditures, the credit may be obtained and all of the costs can be written off in that year. If the investment tax credit is claimed, the costs must be capitalized and depreciated, resulting in a five-year write-off of software costs. This difference alone seems to distinguish the claiming of these expenses as R&D costs as preferable.

However, the R&D credit is only available until Dec. 31, 1985, and is based on incremental expenditures. If a corporation incurred yearly R&D costs without significant increments, the research tax credit would be minimal.

In this instance, the relevant analysis compares the tax deferral from the immediate write-off of development costs with the overall tax benefit of claiming investment tax credit and depreciating the property over five years. If the tax savings from the first year's write-off can be invested at an overall yield in excess of 10%, treatment as R&D expenditures provides a better result. If this yield cannot be obtained, capitalization would be more beneficial when considering both total tax savings and the time value of money (see Figure 4).

Notwithstanding the analysis above, most corporations incurring internal software development costs will probably continue to elect the immediate write-off, largely because of the current emphasis on immediate cash flow.

This analysis presupposes that software costs, in some instances, can be characterized as either R&D expenditures or as amounts spent to acquire a tangible asset. Some support now exists for each type of treatment, but the ultimate characterization of software will not occur for several years. In view of the uncertainty, the wisest course is to determine which approach yields the maximum tax benefit and to use that approach consistently.

Personal Computers

The cost of a home computer is deductible to the extent that:

1. It is used in a trade or business (which includes work done at home for your employer).
2. It is held for the production of income (that is, recordkeeping functions for stock and other investments).
3. It is used in connection with your personal income taxes.

The proper approach is to determine the percentage of time you use your computer for these activities as opposed to others. This percentage of total costs can be depreciated and, in the first year, investment tax credit can be claimed.

About the Author

Jan Lee Ozer is a tax accountant with Deloitte Haskins & Sells in Atlanta. During his three years in public accounting, he has developed a special interest in the area of tax planning for software development and acquisition.

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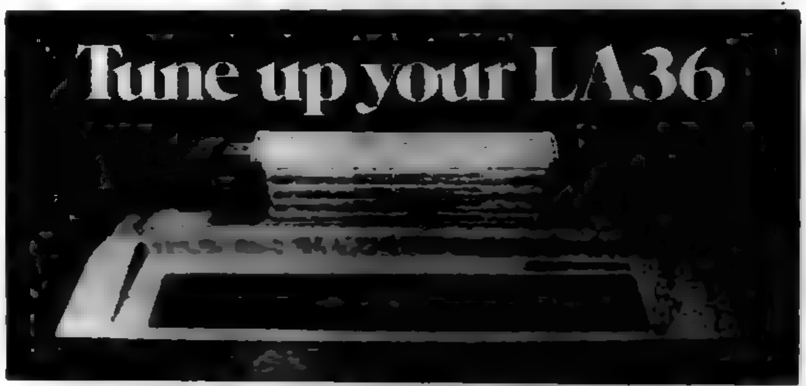

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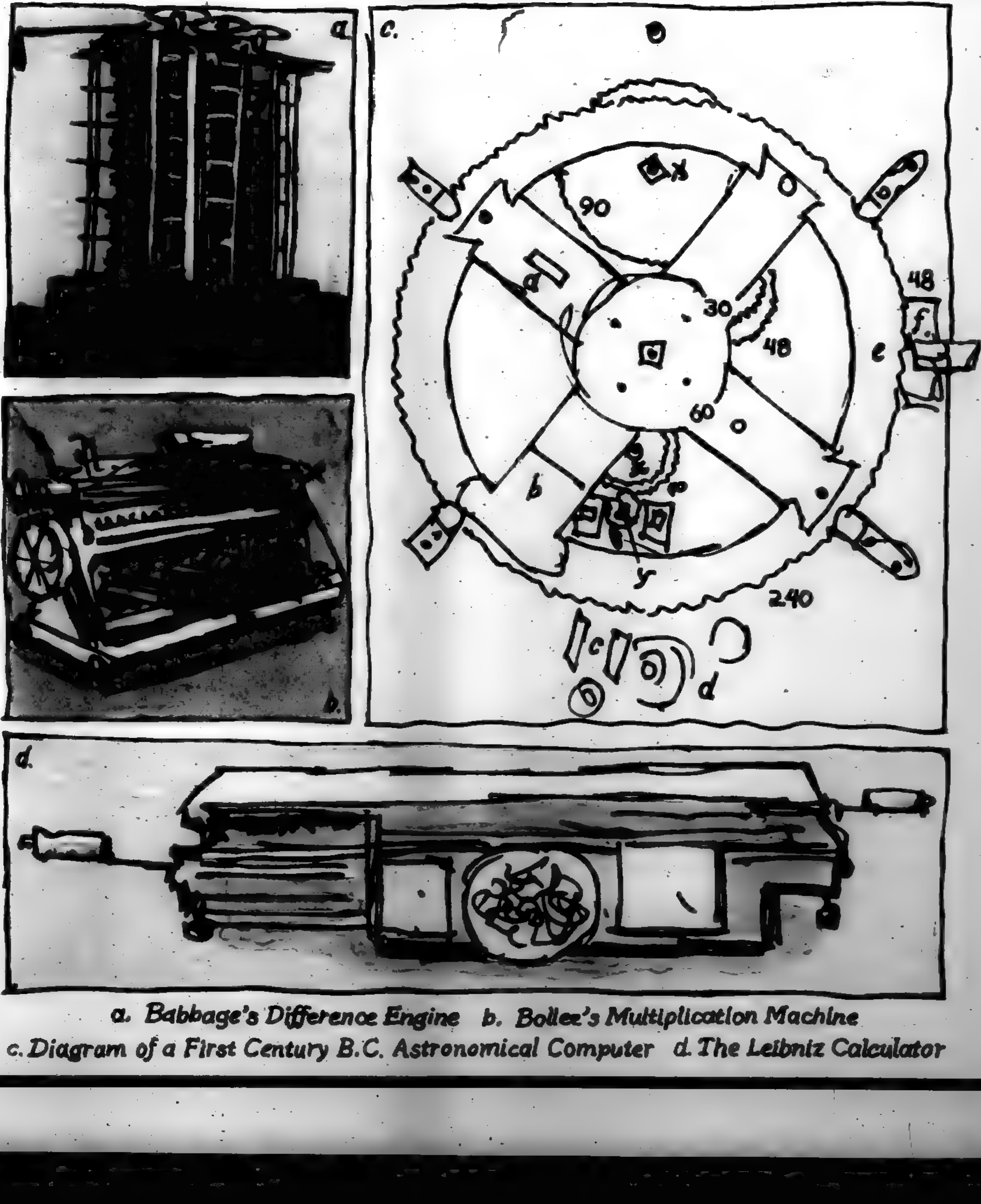
INFORMATION SYSTEMS ENGINEERING

By Terry Goodbody

Change has become the norm in developing information systems, but the data processing community too often approaches change with a "wait-and-see" strategy. DP departments can no longer afford to rely on old, proven development methods and work without an organizational standard that provides enough flexibility for applying new technologies.

The business community has further complicated the wait-and-see strate-



a. Babbage's Difference Engine b. Bollee's Multiplication Machine c. Diagram of a First Century B.C. Astronomical Computer d. The Leibniz Calculator gy by becoming educated in DP and searching for new information solutions. Home computers and distributed processors can easily be purchased by any major department of the corporation and the cost hidden from DP. If such ventures bring results, the DP community will find it difficult to take away a proven business solution to an information problem.

Over the last 10 years, business has been reluctant to wait for results. New technology forced DP, in many instances, to create information systems with shorter development time frames just to maintain control. DP has had to rely on crisis management (fixing systems as a result of bad architectural design), as opposed to giving any thought to how to construct better information systems given the changing environment.

Information systems engineering is a concept that provides the organizational game plan. It outlines responsibilities for the architectural drawings, the engineering for each component, the map of the environment and the configuration plan in constructing an information system:

In addition, information systems engineering supplies two concepts in order to balance the overall approach to information systems architecture: information resource management and a standard environment. These two concepts are combined within one organization.

Today's systems development tools must be better managed to take advantage of a total information system development strategy. Understanding how to use these tools will result in better management, faster development life cycles, complete data understanding and a well-executed DP organization with clear-cut lines of responsibility.

Information systems engineering focuses on four areas:

- *Environmental management* protects the application dollar investment of the corporation by providing "middleware" between the application program and the technology, establishing a standard. This allows the corporation to benefit from new technology with a minimum of application redevelopment investment.
- *Configuration management* provides the organization with a planning, modeling and reporting function, incorporating all components of DP into one integrated plan that is revised daily to facilitate immediate management decisions.
- *Data management* documents all components of the DP environment in detail and provides an independent flow of information that enhances the application processes, but does not confine them to the location of the data or the data base structures.
- *Information management* enhances the access of user requirements beyond the application systems by providing the tools necessary to access information and control the request and the education necessary to understand the condition of the data or information systems.

Environmental Management

Environmental management is an organization that addresses change and manages that change so the DP community can be state of the art without being the "bleeding edge." It provides the method for making a technology decision today, with the ability to recover from a mistake tomorrow.

Through use of a "middleware" approach, environmental management establishes within DP a standard that is the foundation from which all information systems are built. However, the impact of change must first be understood from a DP organization's point of view. This understanding can determine which solutions to apply.

When examining possible areas of change, three major components can be identified in relation to systems development: business requirements, technology (hardware/software) and data. Change to any of these components will affect the others.

Business requirements. The information system is a group of functional processes that must be performed for a given business entity within the corporation. If we assume that the data is always available, as does

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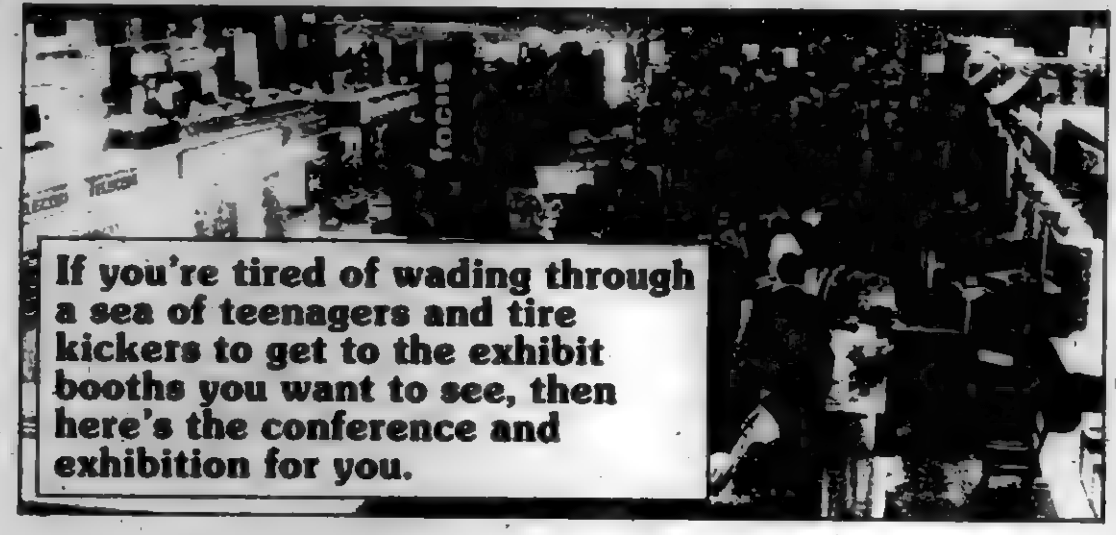

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IBM's Hierarchical Input/Process/Output (Hipo), then the system design approach becomes much easier. The Hipo approach implies that you get data from somewhere, process it and put it somewhere. "Somewhere" does not have to be defined in this systems design approach.

Hipo has become a proven approach in developing the information system. The important point, however, is that the business functions can be created and understood without regard to technology or the manipulation of data (input, output or stored).

Technology. It is the system software that dictates the impact of technology on a given information system. That software consists of four basic functional parts:

- The compiler that interprets into machine language the business requirement once defined via Hipo or some other method and programmed in Cobol, PL/I or another language.
- The operating system that affects the compiler in the interpretation of instructions to get at I/O devices (data).
- The on-line system that in most cases must communicate with the application programs via a call in order to pass data.
- The data base management system (DBMS) that controls the stored data and must be communicated with in order to access that data.

Data. Data further affects the information system beyond the technology in the way that it is input, output or stored. When technology changes, data will be affected. For example, if the DBMS is upgraded to a relational data base system, the information system must change in order to obtain data via another instruction set or another data structure.

The construction of the information system itself can affect the way in which data has an impact. This type of impact occurs through the use of constant data. If the programmer includes a chart of accounts within the information system and the chart of accounts changes, then every program containing this data must change.

In fact, all software is a result of the need to obtain data. Data becomes embedded within the system software and, as a result, becomes part of the changing environment of data and technology.

'Information systems engineering is a concept that provides the organizational game plan. It outlines responsibilities for the architectural drawings, the engineering for each component, the map of the environment and the configuration plan in constructing an information system.'

This environment must be standardized in order to prevent the environmental changes from impacting the information system. The concept of a standard environment as discussed here uses today's DP technology but results in better management of that technology. It consists of four components:

1. Data base I/O processing.
2. Telecommunications I/O processor.
3. General table I/O processor.
4. I/O processor.

These four components are the only way in which information systems access data. As a result, the in-

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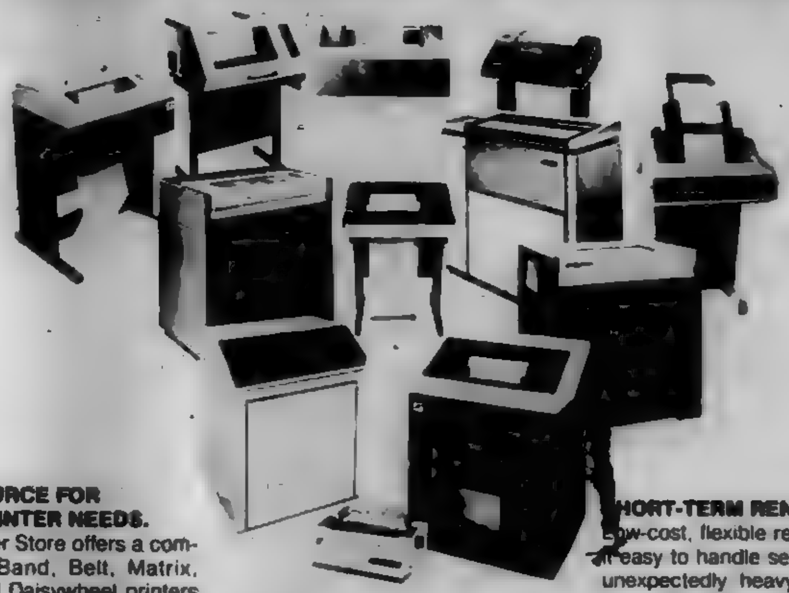

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formation system is protected not only from the data, but also from the changing technology (see Figure 1).

If the information system is isolated from the environment (data, software and hardware), changes can take place within any of the four components of the standard environment without affecting the information system, as long as the interface is maintained. The interface is nothing more than a group of elements (records) that are passed back and forth to accomplish a given function within the information system. All data (input, output or stored) is passed in this manner. As a result, all changes in technology can be accomplished by modifying any one or all four standard environment modules, but no changes are made to the information system.

Information systems can be tested without affecting current development and transported to the new technology once the standard environment has again been stabilized. All standard environment modules are throwaways: They are rewritten to handle technology changes. When change occurs, only four modules are rewritten, as opposed to hundreds of application programs.

Environmental management as an organization is responsible for maintaining this standard. New technology must first be examined for its impact on the information system and, as a result, a standard environment module created to protect the information system from this new technology.

Standard environment enhances the DP organization and supplies the following benefits to information systems:

- Data access and manipulation can be understood by even the trainee programmer/analyst.
- The programmer/analyst is business-oriented, as opposed to technically oriented.
- DP now controls its migration plan to new technology.
- Efficiencies are built into the standard environment and are constantly fine-tuned.
- Only a small group of personnel must be educated in new technology.
- Budgets are greatly reduced within the information systems development area and thereby greatly reduced for DP as a whole.
- New technology is easy to manage and a contingency plan is always available.

Standard environment capitalizes on a good structured programming approach, establishing a standard for the entire DP organization. The initial reaction to the concept is that it is too complicated and unfeasible. This, of course, is a standard reaction to any new idea. In most cases, however, the staff within the DP environment has little if any real experience in new technology and must be trained. This training provides understanding at various levels and can result in many application programs being written poorly. It is often impossible to fine-tune poorly written programs without rewriting the entire program.

Standard environment allows the programmer to feel good about his solutions without worrying about whether or not he created a performance bottleneck. True technical employees can be transferred into environmental management, just as the project leader can have the most technically qualified personnel write the I/O routines.

Configuration Management

Configuration management is responsible for two functions within the confines of this organizational structure:

1. Architecture of data and information systems.
2. Configuration management of information systems; data, hardware and software, which consist of planning, planning support and management reporting.

Data Architecture: With the creation of a standard environment, the data is independent from the information system.

The data still remains tightly interrelated with the technology and is locked into the software that manages it. Data must be understood and, as a result, is confined and managed in order to support technology changes and information systems architectures.

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In the past, the length of time necessary to accomplish a complete information understanding at the enterprise level presented a problem. Studies with IBM's Business Systems Planning (BSP) have been recommended in order to accomplish this understanding. However, business needs are immediate and users may not be able to wait two to five years for a study to be completed.

One approach to this problem is to implement purchased information systems until the information study is complete, and then reevaluate those systems based on the information model. However, even when the BSP has been completed, it is generally considered to be a tool for understanding information and cannot be implemented.

Through the use of data architecture, configuration management answers this problem by examining what DP does today.

Many DP organizations have divided information systems into functional areas: financial, human resources, manufacturing, merchandising and so on.

This approach has allowed a greater understanding of and commitment to the functions needed in each of the major areas, but it has clouded the data issue. An understanding of information systems relies heavily on knowledge of a given business function; however, an understanding of data relies most heavily on knowledge of the entire enterprise (all functions).

In order to better understand the data, various approaches have evolved, such as information engineering, information resource management and information modeling.

While these approaches are valid, most assume the information systems do not yet exist. But the real problem users face is how to deal with the information systems that are already in operation.

Once again, a standard must be established. Data can be likened to land in a site plan, with functions analogous to the houses. The land is designed with consideration to the house's function (pool, patio) and, as a result, the site plan is created. Once this site plan has been established, management decisions can be made.

Phase I of the development should start close to the access road, because the houses may not sell. Phase I would never start at the back of the site plan, because an access path (road) would have to be built. That kind of decision would be risky.

The point is, with the DP community, Phase I may be built anywhere on the site plan, because DP does not create the layout of the land (the data). This is not entirely DP's fault; in most cases, time is the problem.

This is not entirely DP's fault; in most cases, time is the problem.

The following steps are an alternative to understanding all information requirements, but this process takes approximately six months for a given functional area. Six months can be justified by explaining that this time is usually needed to do a master file design for an accounts receivable system. However, when the data architecture is completed, it will include all data bases for all functional systems in that area.

In addition, a stronger commitment is built if the goal is an integrated data base for finance or human resources. The user likes his own data and so does the DP functional area. Once all integrated data bases have been set up for the enterprise, an additional link can take place to form a total enterprise information model.

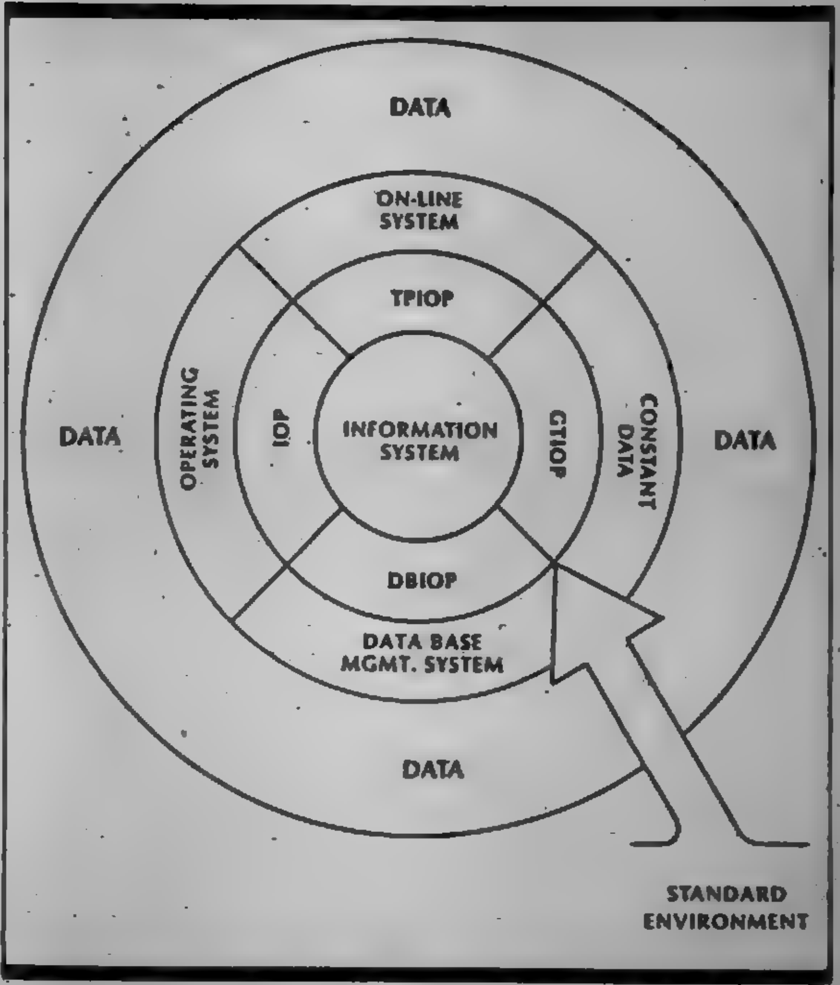

Figure 1

Information Model

The job of setting up an information model should involve these elements:

- *Transfer team.* A team approach must first be established. The team should include members from the information systems department with well-rounded knowledge of all systems within that functional area (finance, human resource, manufacturing and so on). It is best to start with finance, because in addition to the financial application, all systems have financial data impact and must be understood as well.

A user representative must also be part of the team, along with a senior data base analyst from configuration

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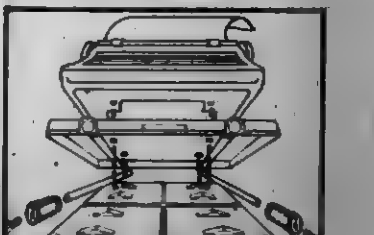

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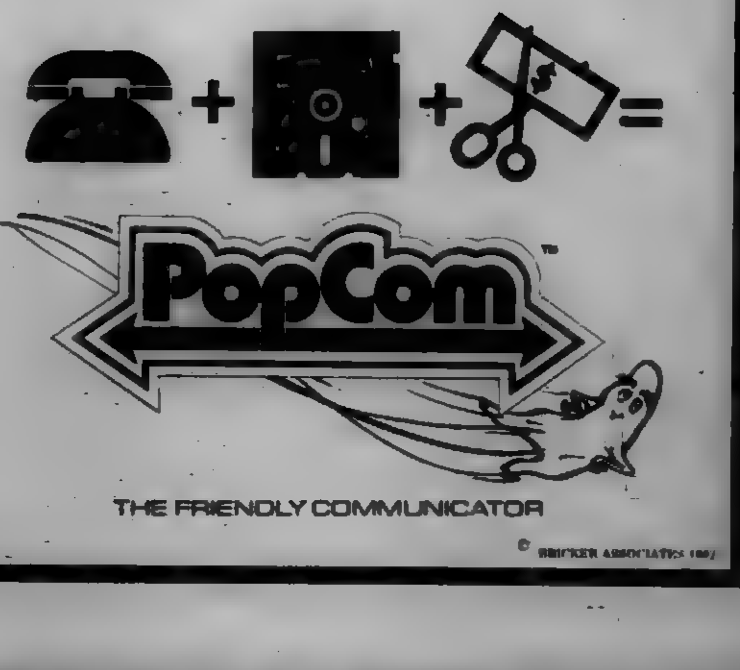

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SYSTEM:								
Function	Volume	Element						Intent

Figure 2. Transaction Matrix

management. A plan for the project must be established with a presentation of the events that will take place.

- *Transaction matrix.* The transaction matrix is prepared by major function for a given information system at the house level. In other words, it is an overview of the process (function) and elements (groups) to accomplish the process. The source of the transaction matrix is from a modified BSP study form. In addition, the volumes must be obtained for each function performed and the intent of the process on the element (update, use and so on). The matrix is illustrated in Figure 2.
- *Gross analysis:* As the investigation of each information system is completed, the transaction matrix is turned over to the senior data base analyst. The transaction matrix is plotted for a logical view in order to accomplish all the functions.
- *Information model.* Upon completion of all transaction matrices for all information systems, the user, information systems personnel and the senior data base analyst team members work together to build the information model. All functions are discussed and all team members must sign off at completion of the information model (Figure 3).
- *Presentation to management.* The information model is now the site plan and can be explained in that manner to management. It is understood that the inventory management data within the merchandise model (Figure 3) must be the first information system developed.

The enterprise might have other priorities. Nevertheless, DP still has the understanding of which data must be loaded in order to create any of the information systems. Strategic planning cannot be done without consideration of the data architectural drawing (information model).

This map must be addressed every time an information system is constructed (see Figure 4).

- *Data definition.* The team continues to define the business descriptions and attributes associated with each element. This information is loaded to the data dictionary.
- *Physical data base.* Once the information model has been created, a physical data base is created and presented to the team. Various data base design tools could be considered for creating the physical data base. Once signed off, modeling begins using the transaction matrix volumes and a simulated accessing requirement based on the intent for each function.

The model is modified until the best performance can be obtained. The results, along with the physical data base, are again presented to the team by the senior data base analyst.

Information Systems Architecture

Once management has selected the information systems sequence for development, based on the information model (Figure 3), the "electrical and plumbing" construction can begin. This is the most critical step and the step most often bypassed.

The processes are examined according to how the document would flow from desk to desk in a manual setup. The information systems analyst must break down these processes. The senior data base analyst and the information systems group then examine each one for "selecting process key" and "ending process key"

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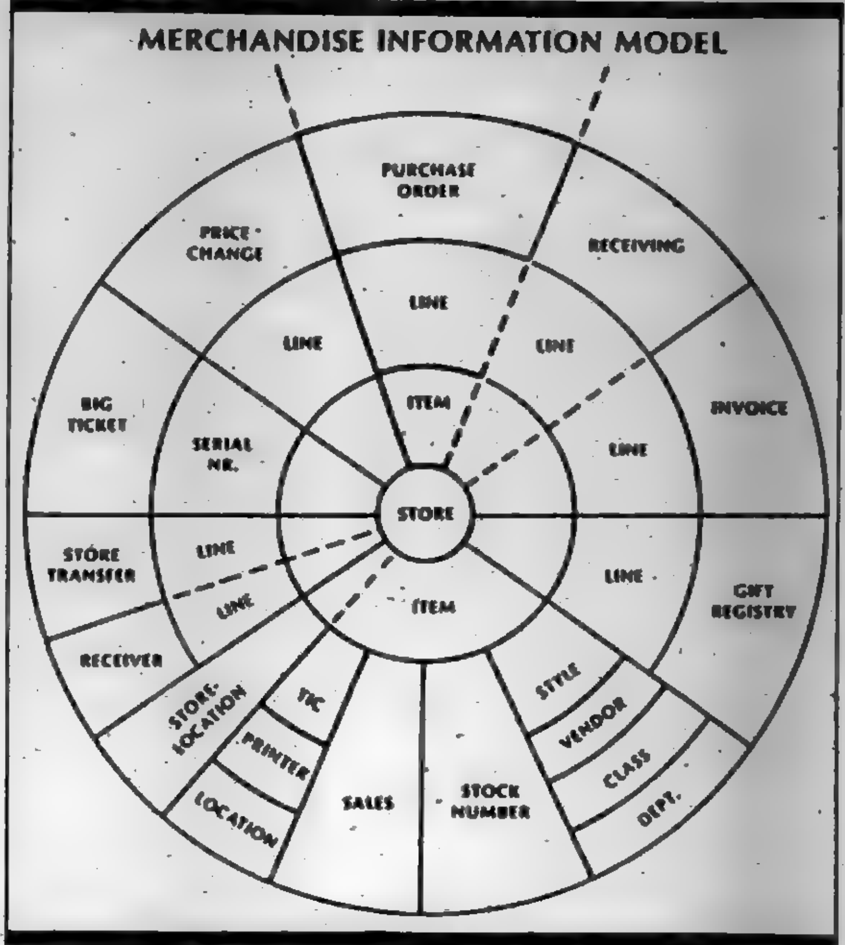

Figure 3

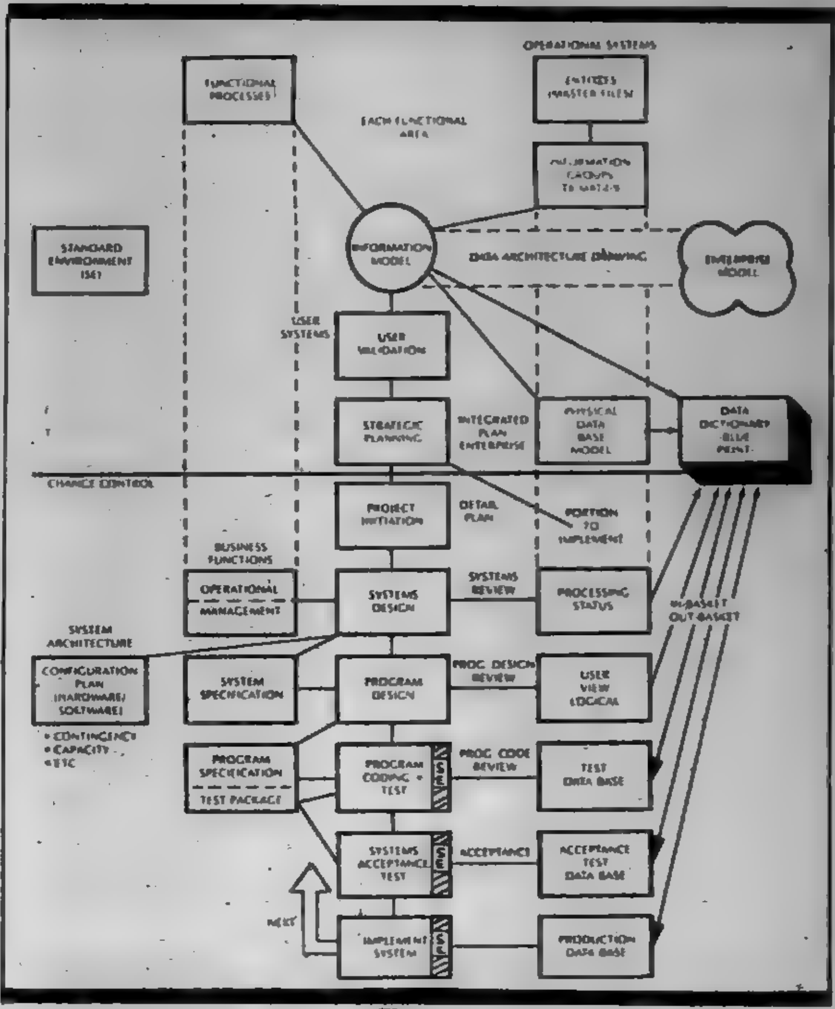

Figure 4

such as, in the case of a purchase order:

1. Initial entry (working).
2. Unapproved.
3. Approved — hold.
4. Approved — send.
5. Receive.

The processing key is established by process as a result of the functions to be performed. The idea is to break the integrated data base into small files for each process; however, the key information is also available for inquiry on a specific purchase order.

This approach allows for the small files that have been created in the past by giving access by process rather than reading a whole group of records or the entire data base. In addition, the systems analyst gets an idea of how to design the system, what an inquiry is, day-to-day functional processing, batch and so on. The processing key will be defined better in the detail analysis and continually updated over time.

The next step is to gain an understanding of how this system will function in on-line, distributed or batch mode. At a meeting of operations, technical support, data base and other personnel, the system concept is presented along with the modeling data.

All concerned must sign off on the system and make estimates for each job including lead times, human resources, equipment needs and so on. At the end of each process, the data dictionary is updated and another model is produced.

The configuration management group must maintain the development plans, as they represent the organization's key to understanding when a given part of the integrated data base will be in production. They also are the group that coordinates all activities with the information systems group. In other manufacturing environments, they are considered production control.

Depending on the organization's size, several levels of the plan must be created after the system architecture is complete. The plan must include an overall plan at the enterprise level, data processing level and departmental level and, finally, a detail plan at the project level. If adequate time and care are taken at this stage, the entire development effort

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Through frequent reports, management should be made aware of all activity. Possible problem areas must be highlighted so that the proper decisions can be made.

In the past, DP has created plans that say nothing more than "code, test, implement," with little understanding or support given to all organizational units that will feel the effects of information system development.

Project managers should be taught how to plan along with every other level of management. However, education is not the only approach. They need assistance as well. No one should be afraid to seek help when constructing the system.

Data Management

Much has been said about data being a corporate resource. The statements are all true. However, data can never be used effectively unless the information system has been constructed to supply information as needed.

With the creation of the environmental management area, information systems are protected from changes in technology and data and, as a result, the application dollar investment of the enterprise is protected.

Configuration management has confined the data to integrated data bases for each functional area. The data has become understood and now independent from technology. The information models can be restructured using any DBMS or new technology enhancements. However, so far this approach has been theory, and no information system has been engineered.

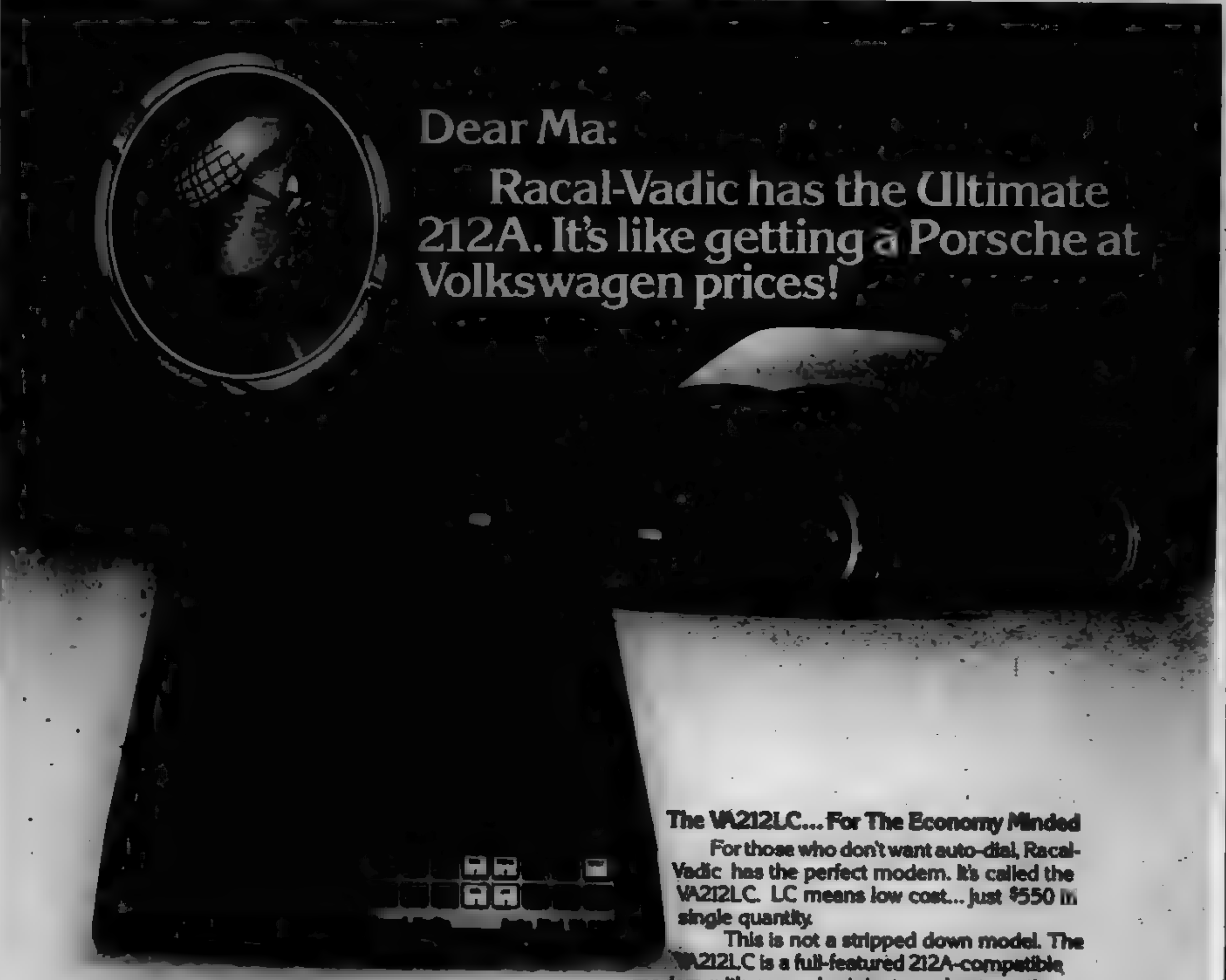
Data management works directly with the information systems project teams. They develop, test and move into production the portion of the integrated data base being developed. Three areas are included in data management: data administration, data base administration and data base management.

Data administration. Data administration provides the blueprint to technology. This function provides an active quality assurance program that begins at the creation of the information model and extends through the day-to-day production of the information system.

The data administration group ensures that plug A will in fact fit plug B. Therefore, they have complete control over all names assigned to all components of the DP environment.

Their tool is the data dictionary, which maintains the data about data, information systems, network, computers, software and so on. Data administration is the enforcer of a strict change control procedure.

The data dictionary con-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tains planning data as well as production data. All documentation is produced from the dictionary and it must produce all data base definitions, standard environment access ability, program source code and network and operations documentation.

Data base administration. Data base administration is the function that develops the integrated data base. Through a close relationship with information systems development, this group must work with data administration, which has complete control over data access and even the routines used within the information systems.

The data base administration group begins with the integrated data base created by configuration management and the data dictionary, which defines the details of the integrated data base. Information Systems begins with the systems architecture drawing and business requirements document. As a team, they begin the systems development life cycle steps under a strict change control procedure.

- *Detail systems planning*. All documentation produced to date is reviewed, including the draft of the project plan. A detail project plan is created and approved by management and forwarded to the planning support group (configuration management).

- *Detail systems design*. The systems analyst uses some method such as Hipo; however, top-down or bottom-up is not the issue. The data base analyst is involved at this point to ensure that data base accessing is used to the fullest and that the trade-offs are completely understood by the analyst.

Next, the analyst is provided with standard transaction codes (if batch), screens and so on, in order to ensure conformity to the standard environment.

Once the specifications are complete and the inputs and outputs defined, the DBA begins to create the logical data views for input to the data dictionary.

Next, test data bases are established with backup/recovery. As each program specification is completed, a program design review is conducted with the analyst, programmer and DBA.

After the design is approved by the team, the analyst begins to create the *test package*. This step must not be overlooked as the test package will live as long as the program. It is the standard of change, the component tester. The test package is loaded to the data dictionary.

The conversion and implementation plans are created and reviewed for sign-off by the team and program copy books or access data are given with each program.

- *Systems development*. The integrated data base update is provided within the test systems along with all entries supporting the integrity of the data base.

After the programmer codes his program, a code review takes place. If it is approved for test, access to the test data base is permitted by updating the standard environment. This step is important, as any bad program could shut down testing for all projects.

At the end of the unit test (program test), the test package is reviewed. This can be accomplished via a test version of the standard environment that prints out "before and after" images. If approved, the program, test package, documentation and data base supporting routines are frozen within the data dictionary.

- *System test*. Once all unit testing is complete and the system is frozen, the systems test takes place. The test packages are run against the information system and the information system continually modified until the systems specification has been met.

- *Production reading review*. A complete review of the information system and integrated data base is made along with all documentation. Data base management is involved to approve the system for acceptance testing.

Data base management. Acceptance testing is carried out by generating all supporting programs, the integrated data base, documentation and test package out of the data dictionary into acceptance test librar-

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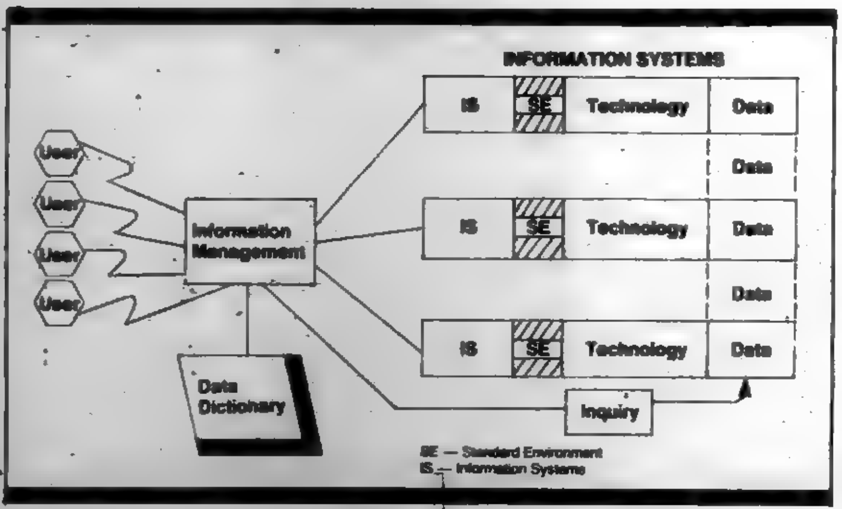

Figure 5

ies. The system is then tested with all other information systems in production. If any component fails, the system is returned to data base administration and information systems development personnel.

Once the acceptance test is complete, a production status review is conducted to ensure all support hardware and software are ready. Then the system is converted via the plans established earlier and all systems are generated from the dictionary into production.

Data base management monitors the production process and if problems arise and corrections are needed, an acceptance test using an updated (if necessary) test package is once again executed.

Information Management

Information management provides the user with a single contact point for all questions regarding information systems, information access and problem resolution. Users do not really care if the problem is occurring with any component of DP; they just need solutions.

Information management, through the use of the data dictionary (blueprint), provides the user with information about information (see Figure 5). Information management consists of two functions in order to provide the user with a total information center concept:

Information control center. All requests or problems are given to Information Control. That group analyzes the request via the data dictionary and applies the proper solution.

Requests are analyzed to ensure the information is not already supplied. As a result, this group supplies information based on need to know.

If in fact the request is a complete information system, the request is forwarded to configuration management.

If the request is above and beyond the information system, then the necessary information access is supplied with the request and forwarded to the information center for support.

Information center. The information center provides the enterprise with answers about how to obtain information from data processing.

It provides tools beyond the day-to-day operational systems. Any tool given to the user must be understood and supported — be it an office system, minicomputer, on-line inquiry facility or batch facility. If the enterprise begins to feel that support is inadequate, then users will handle these matters in their own areas and DP will suffer as a result.

The information center concept must be used to provide support for new technology once it is approved by the environmental management group. Ultimately, this support will add valuable protection to the information systems investment of the enterprise.

About the Author

Terry G. Goodbody has more than 20 years' experience in data processing. As manager of information management for Carter Hawley Hale Stores, Inc. in Anaheim, Calif., he is responsible for data administration, data base administration and data base management in a centralized information systems support organization.

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SPECIAL**REPORT**

Applications Packages: Software in the Fast Lane

Edited by Paul Gillin and Lois Paul

February 28, 1983

COMPUTERWORLD
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Can Be Intelligent, Profitable Decision

Application Software Use Comes Into Its Own

By Dave Litwack
And Joe De Martino
Special to CW

Should your company consider packaged application software? In the 1960s the idea was viewed with suspicion. But a number of events over the past decade have made packaged application software an intelligent and profitable decision. Among the most important are:

- Increased machine power.
- The need for software flexibility.
- Changes in the programmer market.
- Development of better software tools.
- Growing sophistication of software houses.

The last decade has seen major improvements in the capacity of computers to handle complex software. Real storage is now normally measured in megabytes and the almost universal implementation of virtual memory has improved the situation even more. In addition, processor speeds have increased dramatically.

The surprise has been that the complexity of applications has increased even more. The more power we put into computers, the more we ask them to do. The result is the so-called "software bottleneck."

The response to the problem has been to develop software methodologies such as structured programming and to create a set of sophisticated tools such as data base management systems, report generators, query languages and application development systems. But the effect of these tools has been to increase the demand for complex applications.

As applications become more complex, it becomes increasingly necessary to keep them flexible. More complex applications reflect more detail and are therefore more subject to changes that may occur in the business environment. The software necessary to support them requires more lines of code and more complicated relationships. Therefore, it is harder to change once it is developed.

'More complex applications reflect more detail and are therefore more subject to changes that may occur in the business environment.'

A combination of more complex applications and the wider use of data processing has also created a huge demand for programmers. To date, this demand has not been met and programmer salaries have increased rapidly.

There is a degree of risk when deciding whether to develop in-house or purchase outside. By some estimates, a material requirements planning (MRP) system can take over 50 man-years to develop and can cost $2 million to $5 million, far more than the most expensive package on the market. More importantly, in-house development efforts do not pay dividends for several years and sometimes not at all. The end product runs the risk of not meeting design specifications or being written to specifications that no longer exist.

Increased demand for applications coupled with scarcity of trained personnel has led many organizations in the direction of packaged software. Applications developed in-house suffer from the understandable myopia of their own environment. But when a software house writes an application package, its view must be as broad as the entire marketplace.

Furthermore, the maintenance of a packaged application is the vendor's problem. Perhaps more than any other product, software suffers from personnel turnover. Successful software companies suffer less from this problem because better qualified people tend to migrate to them and stay put.

Before doing business with a software company, it is a good idea to check its staff situation. Does the company have the financial resources devoted to research and development to maintain a top-notch staff? What is its turnover rate? If possible, check the DP grapevine. Is a job at the vendor considered a "plum" in the market, hot enough to attract and keep the best engineers?

'Most DP shops are not set up to develop and maintain quality manuals . . . this is part and parcel of a software developer's business.'

The proliferation of computers in the '60s and '70s led to an increase in the demands made on data processing departments for new and more sophisticated applications. During this period the software industry concentrated on providing tools to aid in the development of applications — tools such as data base management systems and teleprocessing monitors.

The integration of these tools with data dictionaries led to faster development of applications that were better documented and therefore easier to maintain. By basing system designs on integrated data base/data communications software, companies were able to develop systems that were, at least in part, independent of the data being used and therefore easier to modify and enhance. By acquiring tools such as user-friendly report writers and query languages, DP departments were able to give the end users direct access to data.

Vendors of system software are now beginning to offer application systems based upon the software tools they provide. These new application packages will be based upon state-of-the-art technology in system software and will therefore be more flexible and easier to implement and maintain in a wide variety of environments. Furthermore, they will be designed specifically to take full advantage of such facilities as data base management systems rather than just provide interfaces. This makes it extremely easy to tailor and integrate the packaged application with existing nonpackaged software.

When evaluating software packages, companies should look closely at the system software upon which the packages are based. Many application software vendors claim to have flexible systems because they are able to support many data base systems and file access methods.

(Continued on SR/4)

Inside

User-Friendly Software Fills Programmer Gap SR/3
Manufacturer Survives Package Conversion SR/4
A/P Installation Warranted Careful Planning SR/5
Installing Application Package Can Be Painless SR/7
Hospital Performs Major Software Transplant ...SR/9
Church Firm Cuts Backlog With System SR/11
Software Documentation A Major Problem SR/13
Common Misconceptions About MRP Dispelled SR/14
Users, DP Must Share Package Implementation SR/20
Support Needed for Management Software SR/21
Package Installation Requires Careful Planning ..SR/25
What to Do When The New Package Arrives ...SR/26
Phoenix Update Controls City Finances SR/27
Medical Firm Learns Value of Vendor Backup SR/28
Manufacturer Profits With Accounting Package ...SR/30
Food Firm Switches From T/S to In-House Package SR/34
PMS Package Ups 'People Productivity' for Firm SR/39
Firm Strikes Oil With CPU, Accounting Package ...SR/40
Firm Handles Contracts With Project Manager.......SR/41
Engine Firm Saves With Distribution System ...SR/45
Posing Questions Helps To Define Your Needs SR/47
Insurance Firm's Investment In System Pays Off SR/48
Educators Group Chalks Up Growth to System SR/49
Problems That Confound Personnel Data Bases SR/51
Finance Package Shoulders Firm's Accounts ..SR/53
Food Firm's Find Handles Shipping Rates SR/55

Raychem Corp. Technology Division's Rick Campbell and Joan Brick discuss data to be analyzed by the RS/1 research software.

User-Friendly Software Fills Programmer Gap

MENLO PARK, Calif. — A company that lacked a staff of programmers but needed to computerize found that user-friendly software was not merely a nicety — it was a necessity.

Raychem Corp. is a manufacturer here of plastics and other materials for use in the aerospace, electronics, telecommunications, power distribution and process industries. According to Walter Johnson, computer services manager for research and development, "Raychem's strength is in applied research, in the company's ability to develop and capitalize on unique material properties."

In the Corporate Technology Division, researchers work on new technologies, which include products like heat-shrinkable plastics, heat-recoverable metals, fiber optics and high-temperature polymers.

In 1981, Johnson and Kevin McHugh, senior staff member in the R&D computer group, were doing intensive comparisons of computer hardware needed to help manage the mountains of data being collected in McHugh's electrical test projects. It was the accompanying application software that led them to their final choice.

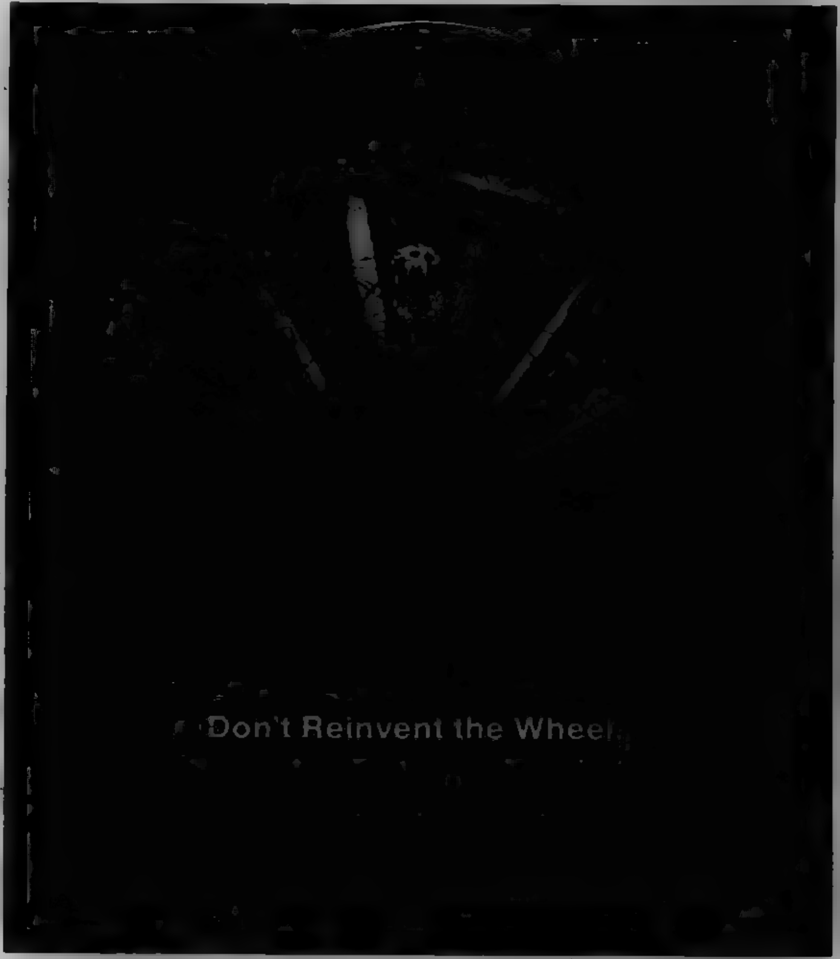
"In our environment, we don't have programmers, so we needed user-friendly software that the researchers could manage themselves," Johnson explained. "We were looking at Digital Equipment Corp.'s Datatrieve for data base management, Minitab Project's Minitab for statistics and a stand-alone plotting package for device-independent graphics. Then we found RS/1."

Raychem chose RS/1-The Research System, developed by Bolt Beranek & Newman Research Systems of Cambridge, Mass. Designed for research laboratories, the package provides data entry and retrieval, two-dimensional and three-dimensional graphics, statistics, curve fitting and modeling. It runs on DEC's VAX-11 and PDP-11 computers.

"It was the other three modes vs. RS/1, and RS/1 won out," Johnson said. "RS/1 has managed to accomplish what the other three together would have done."

In December 1981, Raychem's Corporate Technology Division bought a VAX-11/750 along with RS/1. In March, the group installed a VAX-11/780 and in August, another 11/750 at Raychem's research facility in Swindon, England. In December 1982, the company ordered two more RS/1 systems — for the VAX-11/780

(Continued on SR/8)



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Manufacturer Survives Package Conversion

SAUSALITO, Calif. — It was a potentially difficult conversion: from a homegrown, custom system to a full-function manufacturing package, from a mainframe to a minicomputer. There were setups at two locations and a customer who wanted to bring up a number of software modules at once and shut down the mainframe as quickly as possible.

It was risky too. Aggressive implementation would expose weaknesses in bad hardware or software, possibly resulting in hopeless snarls.

But there were no snarls. The E.D. Bullard Company here turned to Industry Data Services, an integrated systems vendor in nearby Santa Clara. In four months, 13 of the 20 modules in Madic, the manufacturing information system marketed by Industry Data Services, were implemented on a Prime Computer, Inc. 1450 interactive computer system.

Founded in 1898, Bullard is a traditional, mid-size manufacturer of industrial safety equipment. Although it is still headquartered in Sausalito, Bullard moved its molding, assembly and machine shop operations to Kentucky in the '70s.

Unlike most old-line companies, Bullard long ago embraced computers, but its 15-year-old mainframe system did not offer sufficient capabilities for the larger company. Despite having spent a large sum for hardware and software maintenance and salaries for nine programmers, operators and keypunchers, the company still lacked certain capabilities.

Bullard's data base was often stale. Computer-generated information was not sufficiently detailed to isolate problems, nor was the information integrated in a way that would aid in future planning decisions. Managers at the two locations lacked simultaneous access to information. In the fall of 1981, Bullard accepted a change as inevitable.

'The Bullard people knew what they wanted: a system that would support its manufacturing operations and provide financial control.'

After a 12-month concentrated effort by Vice-President of Manufacturing Ralph Gatto, Vice-President and Treasurer Jed Bullard and Management Information Systems Director Russ Douglas, Bullard chose the Industry Data Services/Prime team.

Unlike many companies embarking on such a search, the Bullard people knew what they wanted: a system that would support its manufacturing operations and provide financial control. The system had to be integrated and user-friendly to help cope with "people problems" associated with a switch from batch to interactive processing. And it had to be installed quickly.

Bullard put out a request for proposal to 13 hardware vendors, including Prime. Prime's San Francisco office then asked Industry Data Services, its Santa Clara dealer, to prepare a response. Industry Data Services bid for Madic.

Gatto, Bullard and Douglas spent four weeks evaluating and rating proposals, module by module. The final decision was between Industry Data Services/Prime and another well-known vendor.

(Continued on SR/6)

Packages See Greater Use

(Continued from SR/2)

What this in fact means is that the design of the application must be based upon the least sophisticated system software supported.

No matter how feature-laden a software package may be, it will not be an attractive or wise investment unless it is supported by a stable and reputable vendor. When bugs are detected, sophisticated support operations should be in place to make the necessary corrections within a reasonable amount of time.

The overall package, however, does not consist just of software, but also of documentation and education. With many in-house development efforts, these areas are considered incidental and are addressed only if time and other resources allow.

In summary, the case for packaged applications is formidable. As the demand for more complex applications grows, companies will find it increasingly difficult to develop timely and cost-effective systems in-house, and the trend toward packaged application software will continue.

Litwack is vice-president of product development and De Martino is manager of product management at Cullinet Software, Inc.

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At Machinery Firm's Sites Worldwide

A/P Installation Warranted Careful Planning

WOODCLIFF, N.J. — Installation of a software package can be a massive task, as Ingersoll-Rand Co., an industrial machinery firm, learned during its project of installing an accounts payable system at over 30 division sites worldwide to standardize its accounting procedures.

The number of divisions in which McCormack & Dodge Corp.'s AP Plus system is going on-line could continue to increase, since the system will be made available to all company locations, according to Ingersoll-Rand's Richard Bradley, financial systems project leader.

The installations have required extensive planning by Ingersoll-Rand, which has 100 plants in 17 countries around the globe and had net sales of $3.4 billion in 1981.

Bradley and Clifford Hay, financial systems program manager, recently explained their comprehensive installation procedures step by step.

"It's necessary to understand how we in the financial systems department function," Hay said. "We have no direct authority, but function as a consulting department for our field sites." The department also serves as an educational base for the AP Plus program, since it has prepared six courses about the accounts payable software.

Management Overview Course

Initially, one of these courses, a six-hour management overview, is given to the plant managers who use the firm's IBM System/34, /38 or 370/4300 hardware and who are interested in installing AP Plus.

Then, Hay and Bradley conduct an intensive, one-week training program at the division for the site project leaders. This course, based on the one-week curriculum developed by the Financial Systems Department, uses a manual about 800 to 900 pages long and includes "everything from soup to nuts," Hay noted.

During the next stage, the project leaders develop a conceptual plan detailing how they will use AP Plus. "We ask for all the details that they can provide up front so they don't walk themselves into a corner when they start installing," Hay explained.

The plan is sent to the Financial Systems Department for Hay and Bradley's review. Hay or Bradley then returns to the division to make recommendations based upon their review of the plan.

"Then we provide the software," Bradley said. This step initiates program installation, testing and data load.

During this phase, Hay and Bradley help the site managers in three ways. "First, we maintain a fairly high level of telephone contact, so that we're pretty much abreast of their progress," Bradley noted.

Secondly, the two financial systems leaders also learn about the implementation progress and any problems by reviewing monthly reports that the site project leaders complete and return.

Finally, Hay and Bradley also visit the site as necessary. Hay pointed out that a simple installation may not require a visit, but a complicated installation may require up to four visits. Usually, one of the two returns to the site once or twice for interim reviews.

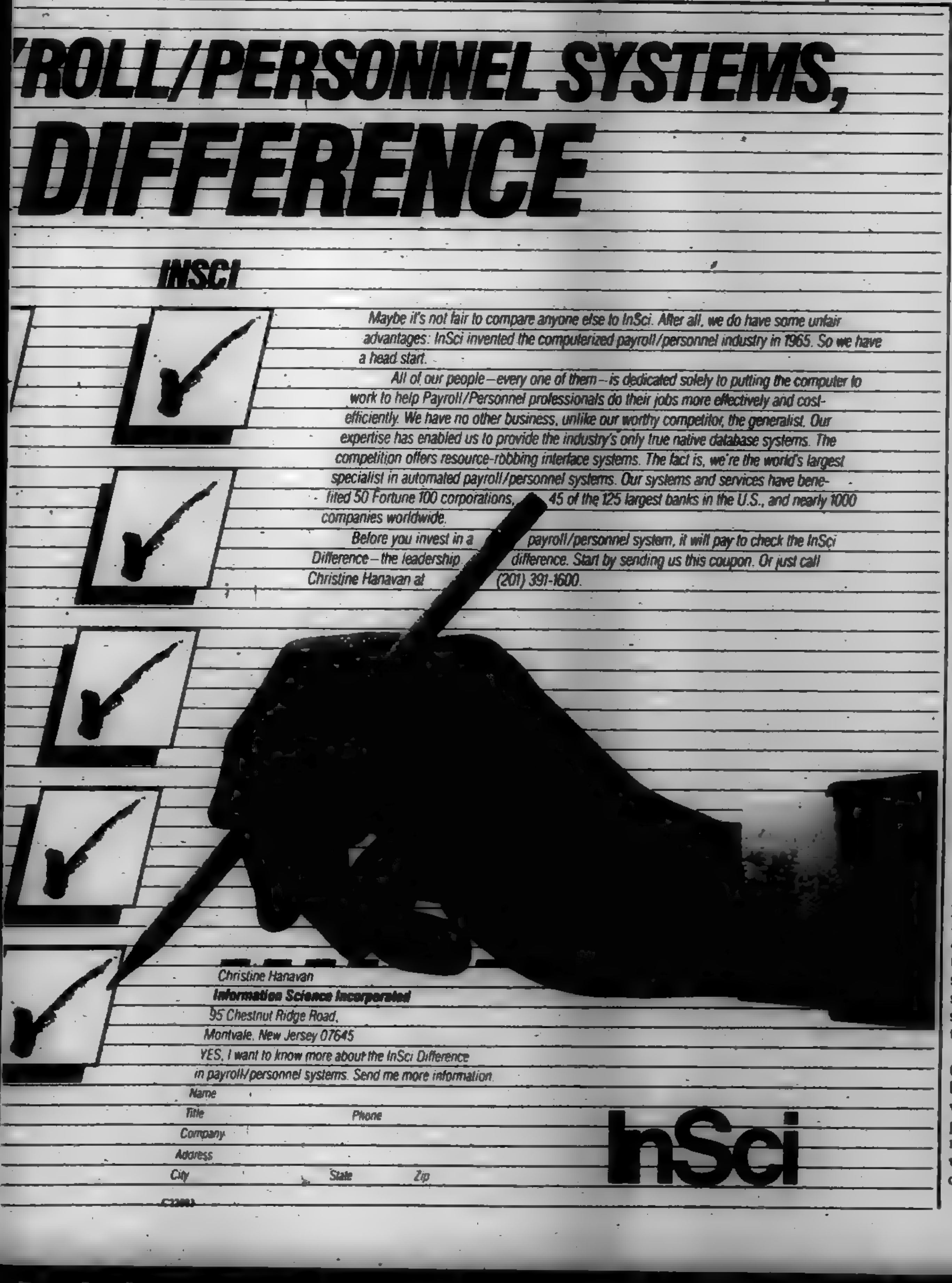
The next stage, running AP Plus in parallel with the old accounts payable system, may also include a visit from Hay or Bradley. At this time they ensure that both systems are running accurately, Bradley said.

Once AP Plus goes live, Hay and Bradley begin an "extensive on-site, post-implementation review," Hay noted. The site is scrutinized to make sure that employees operating the software are cross-trained, that all records are retained and that internal controls are orderly. "Those are the areas that may be remiss," Hay pointed out.

Planning for a thorough implementation like this requires time, according to Hay. He said that site managers are contacted about one year in advance of AP Plus implementation in order to canvas interest and set site priorities. The installation requires four weeks for a division with a small computer to about six months for a site that has 10 divisions sharing a data base, according to Hay.

Hay and Bradley also continue their intervention with AP Plus sites by offering the four other courses developed by the financial systems department and by sending a quarterly newsletter, eight to 12 pages long, which focuses on ideas drawn from other sites that have explored

(Continued on SR/6)



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Old-Line Firm Survives Risky Conversion

(Continued from SR/4)

Gatto cited the strength of the Madic manufacturing package as a key factor in its selection.

But Gatto and his group also looked closely at what wasn't available. "If they didn't have what we wanted, we needed to know that we could get it. Support was vital to us," Gatto added.

"We didn't expect it to be perfect," Gatto said, "but we knew we could find ways to make a good system work. Madic's structure was well thought out. It really fit together."

Bullard's strategy was to implement everything — or at least the business functions — at one time. Industry Data Services first set Bullard up on its time-sharing service. Next Prime installed its 1450 minicomputer with CRT terminals in Sausalito and Kentucky.

Industry Data Services spent a total of 20 days over the next four months setting up and implementing the software system.

Implementation was on deadline. Even Gatto was unprepared for such a smooth transition. "Next time we would not go parallel for two months," he said. "It's nerve-racking with so many modules. One month would really be enough."

Immediate cost savings justified the new system and the potentially risky decision in bringing it up so quickly, Gatto said. The data processing staff was reduced from nine to one. The monthly software/hardware lease and maintenance costs of more than $10,000 were also cut. The intangibles — speed, detail, overview, flexibility, vastly improved communications and improved business practices — were as significant as the reduced costs, he said.

Most important, Bullard insists, they have put terminals out in the plant. Everyone has access. Everyone has input. "That's where the revolution is," he said.

Firm Installs A/P System

(Continued from SR/5)

unique capabilities of AP Plus and addresses sound implementation techniques. The newsletter is currently sent to 450 Ingersoll-Rand employees, Hay said.

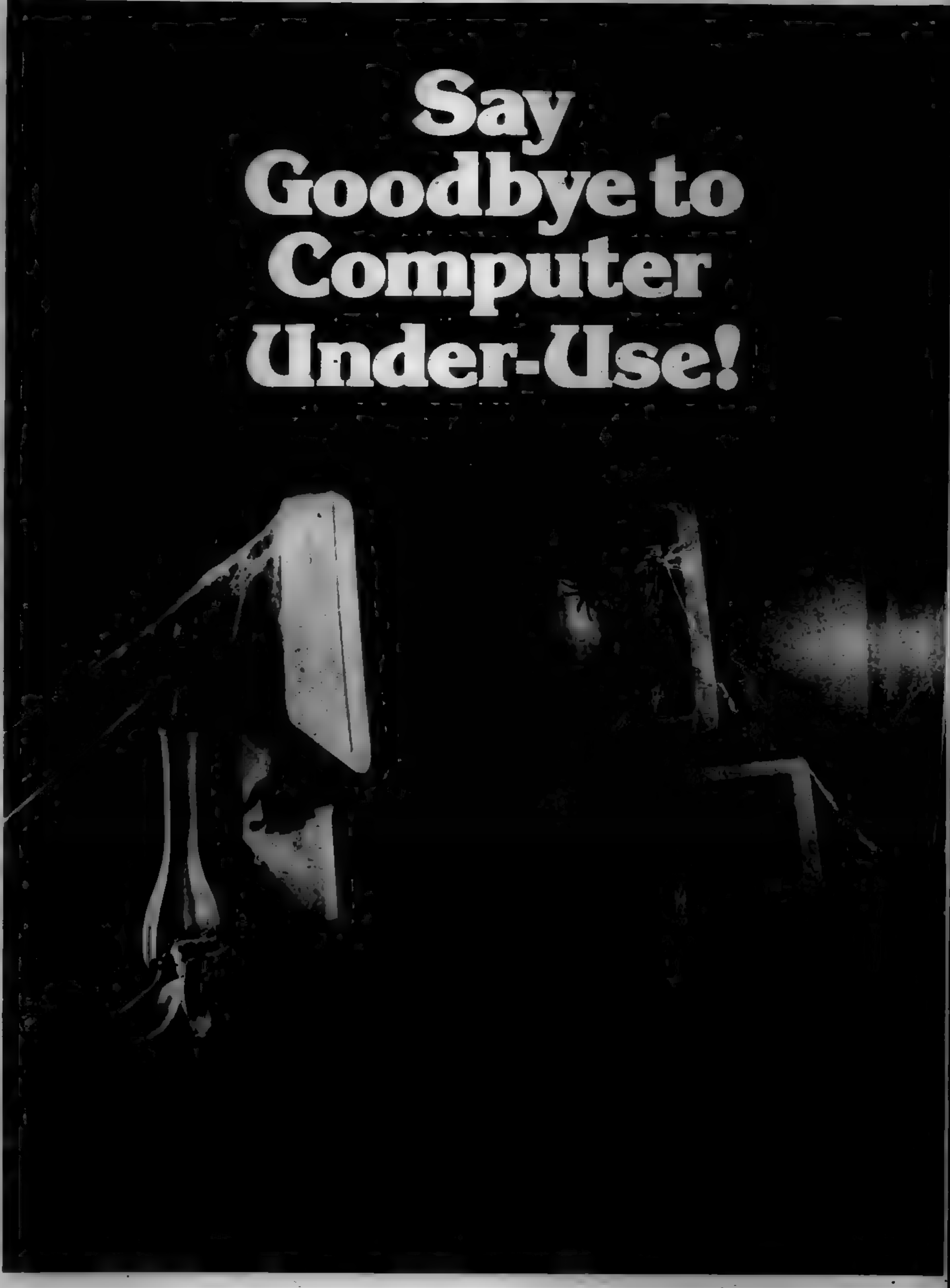
Bradley and Hay are also prepared to help site leaders as the sites upgrade to new hardware, as new employees need training and as new divisions or acquisitions decide to install AP Plus. The Financial Systems Department is also responsible for on-going maintenance and installation of enhancements at divisions having already installed the package. According to Hay, the process never really ends.

A major corporation like Ingersoll-Rand chooses the software for its extensive operations carefully, and Bradley and Hay described how they chose the McCormack & Dodge accounts payable system.

The software firm beat its competition by fulfilling more specifications sought by Ingersoll-Rand, Hay said. The Ingersoll-Rand Financial Systems Department came up with 45 specification requirements in May 1981. Of these, almost every "must-have" spec was met by AP Plus, and about half of the "nice-to-have" specs were provided, Bradley noted.

Most importantly, the AP Plus software offered financial systems standardization, state-of-the-art sophistication and McCormack & Dodge support, according to Bradley and Hay.

"Thanks to these elements, I think that there's a dollar savings in terms of additional control that the system will provide," Bradley said.



With Planning and Communication

Installing Applications Package Can Be Painless

By Bob Bray
Special to CW‡

With adequate planning, communication and effort by both parties, installation of an application package can be practically painless. Using the guidelines below, correct preparation and realistic expectations will pay off in savings of time, money and headaches.

Investigation. Investigate the vendor and the specific applications to be purchased. Know what is needed by the end user before contacting vendors. After contacting the vendor and receiving information on available packages, give the materials to users for review before scheduling a demonstration. The users will then be able to ask more informed questions.

Check each vendor by calling current customers or visiting installations where the software is being used. Talk to the DP department and users. Find out if the package operates as represented. View the documentation and ask for comments from customers. If you receive negative comments from a particular customer, discuss it with the vendor.

There are possibly two sides to the story. If you hear totally negative comments from all the customers, do not buy the package, but let the vendor know why you decided against buying. Do not shy away from a package only because there are no other users of that particular package. If other packages offered by the vendor are highly recommended, the new application will probably be written with the same standards.

Also, discuss with current customers the capabilities and professionalism of the vendor's staff. A high turnover rate could indicate serious management problems. Are customer support representatives easily accessible? Are questions answered in a timely manner? The individuals involved can be the critical element in success or failure of any installation.

Negotiate. Beware of any package or service acquired cheaply. The product most likely warrants the price. Any deduction from list price may be compensated for in another area. Remember — if the vendor does not show a profit, he will possibly not be around when you need support.

Compare prices on various packages with the functions available. Develop a scale to assign points to all aspects of the packages. Use this scale to evaluate prices. If the desired package is overpriced, explain your determining criteria to the vendor. Usually, an accommodation can be reached.

Modifications. Anytime modifications are to be made to an existing application, or a new application is to be written, all specifications should be submitted in writing. Any vendor with experience will allow minor changes after the contract, but cannot afford to give the customer a blank check for further modifications. Users should review and sign the specification before a final bid is made.

Once the contract is set, stick to it unless a major design flaw is discovered. Do not expect the software vendor to be able to hit a moving target. Set reasonable delivery dates allowing for possible problems. Be careful when telling management the system will be ready on a specified date. Allow plenty of time for in-house quality

(Continued on SR/8)

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Planning Key to Painless Package Installation

(Continued from SR/7)

assurance before beginning parallels. Always run parallels. Document any problem completely before calling the vendor.

Installation. One of the most frequent problems during installation is lack of preparation by the user. Each person to be involved in the installation should read all available documentation before the installation team arrives. You should also make arrangements to free those who need to be trained on the applications.

Be aware that the normal work flow will be interrupted during the installation period. Plan ahead for work that must be accomplished and inform the vendor of the schedule beforehand. Set up an area for the training personnel which includes access to terminals and telephones. Expect long hours during the installation; the vendor does.

Post-Installation Support. Read the documentation. If it does not explain the answer sufficiently, let the vendor know. It will improve his product and reduce his nonbillable time. If problems occur, provide the vendor with as much information as possible. Send any comments, complaints or suggestions to the vendor in writing. If the action taken is not satisfactory, notify top management of the organization in writing.

Three cases help illustrate mistakes to avoid in buying and installing an application. We sold a package to a firm that investigated us

(Continued on SR/10)

User-Friendly Tools Fill Programmer Gap

(Continued from SR/3)

and the UK VAX-11/750. "We are making RS/1 our corporate standard," Johnson explained.

McHugh said he has used the data management, statistics and graphics capabilities of RS/1 for an electrical test project. "With 50 to 60 researchers in the project, I wanted the users to manipulate their own data instead of depending on me to write programs for them," he said.

Data is collected on a network of PDP-11/23s and copied onto the VAX-11/750 for use with RS/1. McHugh set up a simple mechanism for users to move their VAX/VMS files into RS/1. "It takes only two minutes to copy a 200-block file, so our users routinely move their data," he explained.

To effect the transfer of data, McHugh used RPL, the research programming language available through RS/1. RPL enables users to extend and tailor system capabilities, construct new analysis procedures and access other programs, resources and data files, McHugh said.

In the electrical-test project, researchers measure polymers for such responses as resistance vs. temperature, resistance vs. time, resistance vs. temperature and time and voltage vs. time. "Before RS/1, we could test only resistance vs. time and temperature. We can do more work now than we could before," McHugh said.

Moreover, each user can manipulate data through RS/1 without a programmer's intervention. "Each user wants to do something different with his data," McHugh said. "They can create a simple graph from their data and can massage it with curve fitting and fancy mathematics. If they want to do any massaging, let RS/1 do it. RS/1 freed me to do acquisition of data, which is more difficult and satisfies the greatest number of users."

Johnson reported that RS/1 is strong in three areas. First, researchers can easily display and graphically manipulate their data, he said.

Second, users can pull data from their files and use it in an almost infinite variety of plots — without the need for programmers to develop the plotting routines.

The third strength of RS/1, according to Johnson, is its impact on Raychem's research community. "We see a significant increase in the number of people who are turning to the computer in order to perform their work," he said. "In the past, their data has often gone unanalyzed because of the difficulty of displaying it. With RS/1, once we got people trained, the number of users increased; they helped themselves to get through the basic operations and they helped other users."

Applications of the software have gone beyond traditional research, Johnson noted. It is being used in data management, in functions such as disk utilization and budgeting and as a general plotting package to plan space allocation in Raychem's new building.

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Full-Scale Inventory Aid Needed

Hospital Performs Major Software Transplant

TAMPA, Fla. — As part of an expansion program targeted toward meeting growing community needs and responding to changes in medical technology, St. Joseph's Hospital here saw the need to replace its existing software with more flexible packages.

"Our in-house system just couldn't keep up," explained Jerry Cox, director of systems and programming. "Our primary interest was to find a single vendor who could satisfy our reporting and data collection requirements. Once we found the software that met our needs, we were even willing to replace our hardware, if that were necessary," he continued.

Assistant Administrator Leo Murphy explained that after an evaluation period, a committee at St. Joseph's selected products from Management Science America, Inc. (MSA). In July 1978, St. Joseph's purchased six packages from MSA, including its Inventory and Purchasing System (IPS). The committee selected an IBM 370/148 to replace the existing hardware.

During the evaluation, the committee recognized the need for a full-scale inventory system. "At that time," according to director of pharmacy Don Carlton, "our system was an in-house manual stock card system that didn't keep a perpetual inventory."

Inaccurate Inventory

Joan Chambers, director of Central Supply, explained that "Central Supply is located all over the hospital, and it maintains all the supplies needed to keep a hospital going. But because the area is so spread out, the physical inventory count was never completely accurate. We were unable to prove there was an excessive amount of inventory or to track it."

"The pharmacy had been the only department that kept information on a computer," Carlton said. "But all we had then was an in-house system that produced a printout listing a three-month usage level of pharmacy items. We took this information, manually counted against it to determine how many items we needed to order and issued a purchase order.

"There was an inventory of $315,000 in the pharmacy alone, which I thought was excessive. But our lack of control was so great that we didn't know how often an item was being used or the true cost of that item at any point in time. I also thought 5,000 items was an excessive number to maintain in the pharmacy — but, again, we had no way to prove that."

Implementation of the IPS began in February 1979; the system was scheduled to go live by Aug. 1. St. Joseph's remained committed to this schedule and dedicated the necessary personnel to ensure its completion.

The hospital paralleled IPS with its existing card inventory system for one month. Then it took a second inventory at the end of July. On Aug. 1, IPS went live in the Purchasing Department, and the card system was discontinued — right on schedule. Pharmacy and Central Supply went live in the next few months.

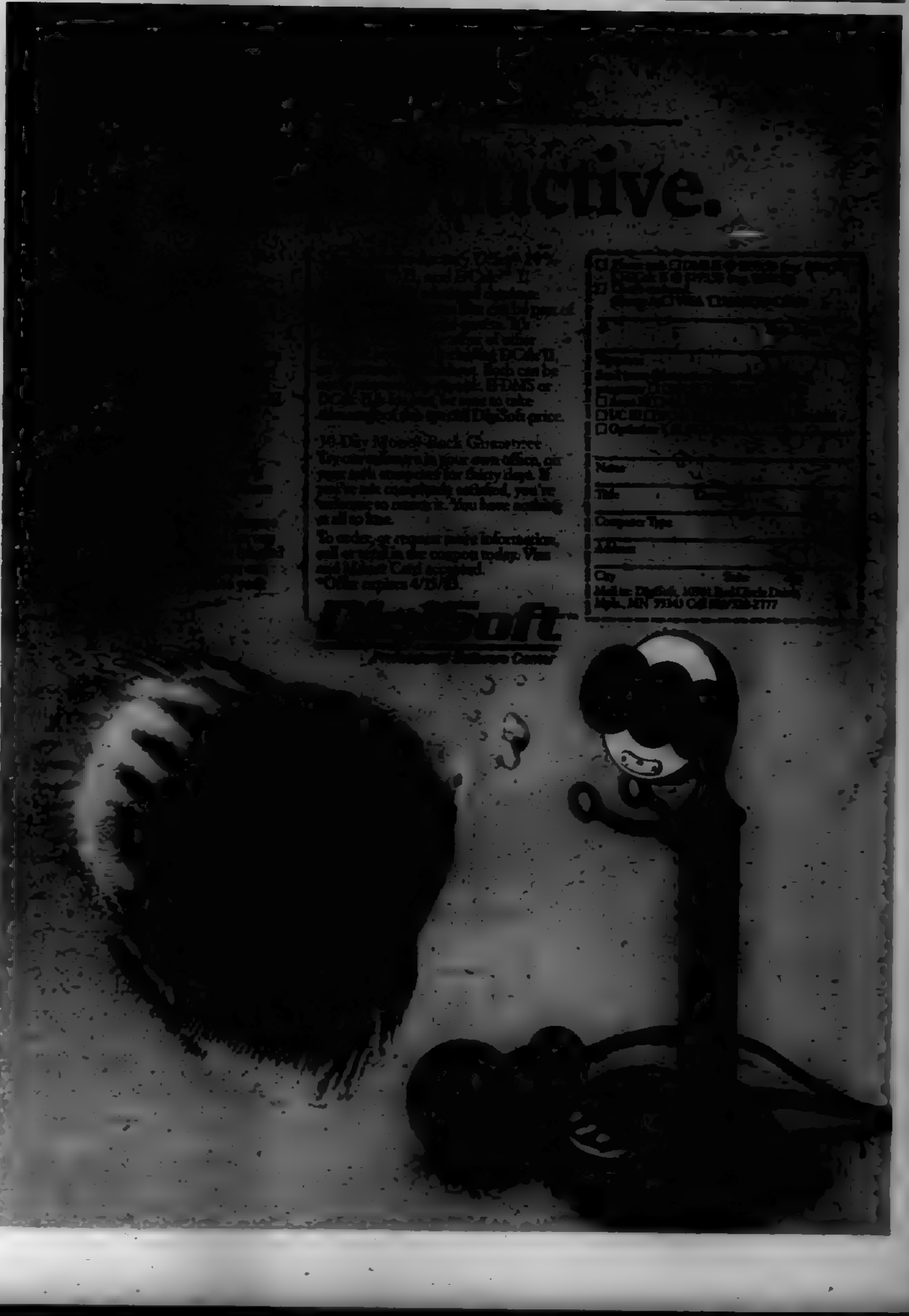
St. Joseph's now orders its pharmacy and central supply items through the use of the economic order quantity, reorder point and safety stock features available in IPS.

'Our primary interest was to find a single vendor who could satisfy our reporting and data collection requirements.'

"In the pharmacy, IPS automatically calculates the usage of our top 100 items," Carlton said. "When a particular item reaches a predefined reorder point, it automatically produces a purchase order. On the rest of the items in inventory, the system generates a report when the reorder point or safety stock quantity point has been reached for each item. When enough items are needed from a particular vendor, it completes a purchase order listing item number and quantity. Purchase orders aren't automatically produced for low-usage items, however. The system enables St. Joseph's to order from a specific vendor all at once instead of making several small orders.

"The pharmacy has decreased its inventory from $315,000 to $210,000 using the system's optimization feature — a very drastic reduction," Carlton said. "We've also reduced the number of items in stock from 5,000 to 2,600, practically cutting our

(Continued on SR/10)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(Continued from SR/9)

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Another major benefit of IPS, according to Carlton, is its special reporting capabilities. This includes a daily Stock Status Report and a Demand History Report. The Pharmacy Department can now classify the pharmacy stock and get a separate printout that shows one drug has gone up and another has gone down.

"By collecting information on the number of units and the dollar amount of specific drugs prescribed by physicians, we've been able to show and educate the physicians on the differences in the cost of generic drugs vs. name-brand drugs. This has resulted in a tremendous reduction in the amount of dollar volume of inventory we maintain. In turn, it's reduced the cost of health care to the patients," Carlton continued.

"IPS has helped a great deal in the control of inventory pricing," Chambers said.

"In a typical week, we usually have 75 price changes out of a total of 2,600 items. When there are changes, the report highlights any price change that is 15% above or below the previous price shown on the system," she said.

Patti Walker, manager of general accounting, agreed. "I definitely think one of the benefits of IPS is control. We can now match the revenues and expenses related to Pharmacy and Central Supply. For example, if a department orders an item from Central Supply, the system automatically records the order and posts the charge to the MSA General Ledger System. And it does this for 100 departments."

The hospital can now maintain up-to-date prices with the IPS interface to its patient billing system.

According to Walker, "IPS maintains the average unit cost for all items in the inventory. We read our inventory file to find an item's average cost. Then we go through a mark-up process, compute a new patient price and compare it to the current patient price. If the prices are different, we update our price file in our patient billing system. We are able to reprice our inventory on a weekly basis with IPS.

"So we're always within a week of having retail prices, and we can charge our patients accordingly," she said.

> *'The pharmacy has decreased its inventory from $315,000 to $210,000 using the system's optimization feature.'*

Planning Makes Installation Easy

(Continued from SR/8)

thoroughly and negotiated a good deal, but failed to communicate properly with the proposed users. During the installation period, the users found several areas needing extensive modification.

An estimate of the man-hours and cost of proposed modifications was delivered to the director of DP who found himself in an untenable position. Management had been informed of the total price of the package and had been given a definite date for beginning live processing. Neither the price nor the date was realistic.

We resolved the situation by making the modifications without charge only because we were replacing a competitor's package that had proven unsatisfactory. Proper coordination with potential users would have prevented the situation from occurring.

In another instance, a contract was negotiated requiring extensive modifications to existing applications. Problems were discovered in several of the programs which could have been avoided with a more appropriate delivery schedule.

A financial application was installed at another customer site, but the installation team found the users too busy with current work to spend much time with the trainers. One month later, the customer was retrained at additional cost. Improper coordination by management when scheduling the installation lead to the extra charges.

With active participation of all facets of the company through the entire process, many potential problems can be avoided. Heed the advice of the vendor. His experience is an asset. It is critical to both parties that installation be successful. Satisfied customers ensure future success.

Bray is president of ICS, a Phoenix-based software company.

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Church Firm Cuts Backlog With System

APPLETON, Wis. — Aid Association for Lutherans (AAL) faced a backlog of programming changes and updates when it attempted to make the information available on its various personnel and payroll systems consistently uniform.

In addition, the firm faced prolonged delays in retrieving information and obtaining personnel administration reports.

"With the conversion to a single system, payroll and personnel information is now consistent and reports are available, in some cases, in hours," Gordon Lundquist, manager of business information systems for AAL said.

Capture of data was inconsistent among the three different employee groups, he explained. Employee hire dates, for example, were included on the separate payroll and personnel systems used for the 1,500 district representatives selling insurance in all 50 states, as well as on the integrated personnel-payroll system used for our corporate staff of 1,200 persons. In contrast, the payroll system for the field clerical staff at 80 nationwide general agency offices did not include the employee hire-date information.

"As a result, comparing and compiling data for such items as Equal Employment Opportunity (EEO) reports was, at best, difficult," he said.

Saving Time, Money

"To write, test and implement the required changes would have taken years, a costly investment in software development and the time, resources and salaries of the data processing and programming staff, "Lundquist recalled. Instead, AAL purchased a single, integrated payroll-personnel system that unified personnel and payroll record keeping, reporting and management for all of the separate employee groups.

The corporate staff, whether hourly or salaried, is now paid every other week rather than twice a month, Lundquist noted. Vacation time and benefits are now tracked by hours rather than by days. Salary administration for both exempt and nonexempt personnel was recently changed to the method of job evaluation developed by Hay Associates. Information required for

(Continued on SR/12)

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Benefits Firm Ensures Uniformity With System

(Continued from SR/11)

EEO and Affirmative Action reporting will eventually be consistent for the association's entire employee population.

"More importantly, the system employs an information retrieval and reporting design that enables the association's user staff to enter, edit, validate, update and compile data using 'noncomputerese' commands," he said. "This enables our users, employees, salary administration, payroll and other executives, for example, to retrieve information and design their own reports profiling our employee population, structuring organizational charts, developing salary grids, checking budgets and monitoring increases in staff."

Finished edited reports are usually processed overnight, others in hours, providing executives with efficient, effective tools for managing human resources, he added.

"In contrast, our previous systems required executives to request a report from our payroll or personnel staffs, which then explained what information was needed to our DP department. The DP staff then converted the request into computer languages, tested the programming and, after corrections, ran the reports — a process that could require weeks," Lundquist said.

"Using retrieval as a management tool, we reevaluated our tax reporting procedures, for instance, and found we were reporting some data not legally required by some states and the federal government, which was, as well, costly to provide," he explained. The time required to edit reports and program system enhancements were cut by half because terminal users were able to access the data base directly, cutting the 3,000 to 4,000 hours required annually of the DP department for maintenance of the different personnel and payroll systems, Lundquist said.

Aid Association for Lutherans is the nation's largest fraternal benefit society, with more than $15 billion of life insurance in force. The association provides financial assistance to Lutheran and other nonprofit institutions. In addition, AAL's 1.3 million members are provided with the organizational and financial resources to perform charitable, educational and other benevolent projects in their local communities.

Eliminating Repetition

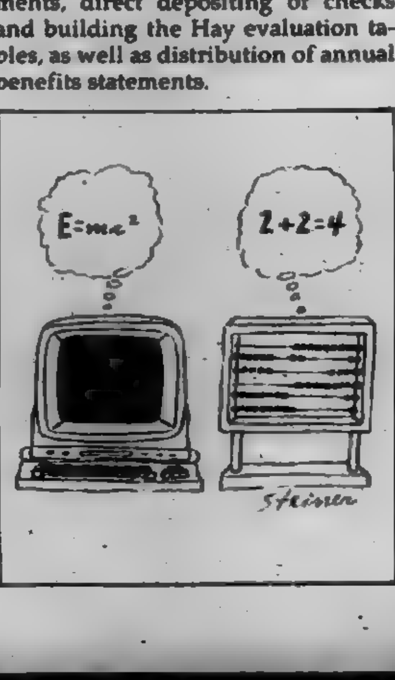
The firm employs a Human Resource System (HRS) acquired from Information Science, Inc. (Insci) of Montvale, N.J. HRS automates the processing and record keeping of payroll and personnel information, including job, wage and education histories, benefits, work locations and transfers, performance appraisals and salary reviews. This integration enables AAL to update an employee's payroll and personnel records from a single entry — for example, a salary change — and eliminate repetitive, time- and labor-intensive tasks.

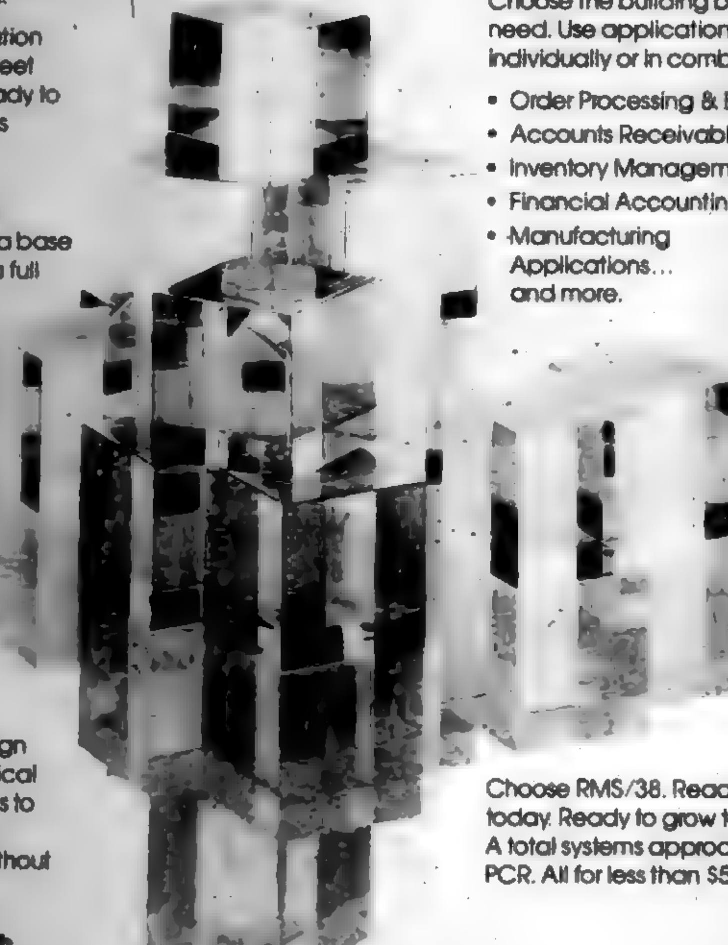
The system was installed on AAL's IBM 370/158 and IBM 3033U mainframes in May 1981. It operates on both a batch and on-line basis and interfaces with general ledger and benefit plan systems.

Computer terminals with direct access to the system are located in the payroll department, as well as in the salary administration, employee relations, benefit plans and marketing departments. Moreover, the association possesses hundreds of other terminals located throughout their offices that may access the system.

To prevent unauthorized disclosure of sensitive information, access is controlled by terminal, individual user and passwords. Also, levels of access further restrict the distribution of information.

There has been no increase in the staffs of the personnel and payroll departments due to the HRS system, according to Lundquist. However, both departments are using the system to compile more information, develop more reports and provide more services, including more complete earnings and deductions statements, direct depositing of checks and building the Hay evaluation tables, as well as distribution of annual benefits statements.





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Efficient Procedures, Standards Needed

Software Documentation a Major Problem

By Frank Clark
Special to CW‡

On a recent visit to a software company to discuss a new software package, the first question I asked was: What type of manuals or other documentation exist for this package? The manager told me that he had nothing at the time but was "working on it."

Though not a typical situation at present, it demonstrates that the problems of software documentation are getting worse, not better. Two of the most persistent problems are poor writing style and inefficient manual development.

The writing style varies from the dense and cluttered style of the early accounting manuals to the "wow, gee-whiz" style of recent applications and systems manuals.

In explaining DP terms, some writing is so brief that it reads like a glossary. Some manuals are so full of coding and flowcharts that businessmen cannot get through them without professional help.

The Other Extreme

Some software houses go to the other extreme. They want to sell their software to everyone, so they set the reading level at about the sixth grade and use the writing style of a comic book.

Inefficient procedures present more serious problems for manual development. The documentation specialist is often the last person to learn about new applications software. He is at the end of the production line — just before the loading dock — and is expected to do his job as quickly as the packaging is done in the warehouse.

Procedures for documentation development must be more efficient. Once management approves of a new software proposal, the documentation specialist should work upfront with the project manager or lead programmer to aid in planning documentation development. This should include interviewing the marketing and technical staff to gather all pertinent information on the subject matter of the manual and asking such questions as: Why use this manual? How will the manual be used?

Then the audience level of the manual must be identified. For example, if the user is a technical professional the manual can easily be organized as a reference type of document. If the user is not a technical person, the writing should be tutorial in style.

The subject matter should then be organized into a table of contents. The next step is to get management approval for the table of contents, thereby establishing accountability for any subsequent changes to the documentation.

With the recent structured programming techniques, standards can be set for most applications programs. A major objective of structured programming is to break down large programming problems into manageable segments. This should also lead to a modular and cost-effective approach to the documentation.

The actual writing should be a series of well-defined segments or modules of information, which are specified in the table of contents. In this manner, documentation can begin when individual program segments are being coded and tested rather than when a completed program arrives several months later. In other words, programming and documentation should be done in parallel. This procedure puts the documentation specialist in the mainstream of software development — not at the tail end of an impatient system.

Structured documentation stan-

(Continued on SR/14)

To Write or Not to Write

Who should not write documentation about applications software?

Programmers and engineers are not known for their writing skills and seldom assume fallibility on the part of the reader.

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Common Misconceptions About MRP Dispelled

By Eric Lange
Special to CW‡

The day of the individual running a complex manufacturing business by himself will soon be gone. Business is becoming too complex and is changing so quickly that materials requirements planning (MRP) systems are the only answer to help plants keep ahead of their competition.

However, many companies are finding that misunderstandings about MRP exist within organizations. This is not surprising. After all, MRP is still a relatively new area.

The following are four common misconceptions about MRP:

- *MRP is all right in theory, but won't work in practice.*

If you are planning to implement MRP, this attitude is almost certain to guarantee failure.

MRP does not work by itself; it has to be made to work. Making it work requires both the understanding and commitment of your company. Positive attitudes, coupled with the right tools, bring positive results.

- *MRP is in our plans, but first we must implement reorder point (ROP).*

MRP and ROP are mutually exclusive. In fact, if your company "makes-to-stock" for finished goods and has few, if any, manufacturing systems, then there is a danger of misconception.

Years ago, many companies introduced computerized finished goods ROP systems as the first step into the uncharted waters of manufacturing systems. It was quickly found that ROP often introduced more problems than it solved.

Some companies, under a manual system, use ROP not just for finished goods, but for all levels of assembly and purchased items. The assumption here is that you will not want to put such a system on the computer.

ROP systems react when a certain level of stock is reached. The due date of the order is almost never changed, though orders do become late. No attention can be given during the lead time of that order to deter-

(Continued on SR/16)

Aid Manuals Deficient

(Continued from SR/13)

dardizes writing much like structured programming standardizes program code. Many users refer to manuals several times a day. These users should always be able to find information in the same format without wasting a great deal of time searching for it.

In addition, software changes or updates can be made in a limited segment of a manual without the need to reprint an entire publication.

Most companies want their documentation specialists to spend as much time as possible on their word processors. They should only need to assign a liaison person to provide the necessary technical information required to document a new software product.

In small companies, the documentation specialist must often be his own editor, technical illustrator and production manager, responsible for formatting pages and selecting type styles.

Even larger corporations become overloaded at times when several new products are released at the same time. These are compelling reasons for a company to go outside for help.

As computers become more of a universal utility, documentation of applications software will have to be written as professionally as the programs it is describing.

Clark is a senior documentation specialist at Documentation Development, Inc. in New York.

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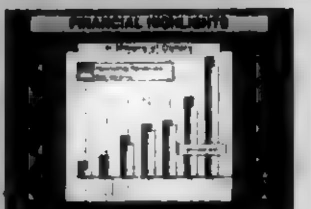

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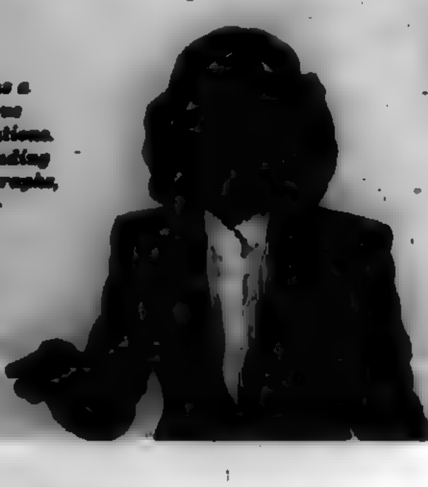

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Four Misconceptions About MRP Dispelled

(Continued from SR/14)

mine if, because of slackened demand, the order could be delayed. Orders are given an urgent status if the item goes into safety stock — even when there is nothing wrong with using safety stock.

It is not always appreciated that MRP itself can integrally control the release of finished goods orders. Thus, items that may have been considered previously as ROP candidates can be controlled in a time-phased way. Orders can also be pulled forward or pushed back according to sales demand. Safety stock can be accounted for sensibly, and urgent action is required only when the plan detects safety stock will run out in the future.

Within a "closed-loop" manufacturing system, the finished goods materials plan is introduced through the concept of a master schedule.

The starting point of MRP can be the control of finished goods on this time-phased basis. Be aware that the implementation of MRP makes ROP redundant. Therefore, it is unrealistic to build an ROP system when MRP is planned.

- *Some people might need MRP, but our problem is capacity planning.*

In nearly all industries, you must tackle materials control before you can deal with detail capacity planning. The exception is if your product is virtually a "one-level" bill; the components are a limited number of plentiful and cheap raw materials and you make to order. In this case, tackle detail capacity planning first.

'We have seen companies that have implemented capacity planning as a first step into MRP. The result is only a small increase in efficiency because the real problems were left unresolved.'

In almost all other situations, there are capacity problems because of a lack of control before work hits the shop floor. You must look for reasons that are causing problems.

We have seen companies that have implemented capacity planning as a first step into MRP. The result is only a small increase in efficiency because the real problems were left unresolved.

The real problems are often caused by material shortages — not enough information about future work when planning that urgent customer order, "rush" orders unnecessarily rushed and work that could be delayed to allow completion of more critical work. This results in a limited ability to respond to priority needs on the shop floor.

By introducing an effective MRP, your capacity can be improved dramatically.

Increasing control over MRP will automatically create priority planning for production, facilitating a shop floor schedule. Only required work will be released to the shop floor. Rush jobs will be minimized and the availability of components will improve, thus preventing panic situations and improving capacity.

A good materials plan backed by a sensible "rough cut" or high-level capacity plan will make for greater efficiency than will capacity planning by itself. Capacity planning is the icing on the cake once you have implemented MRP.

If your problem is capacity, look hard at the real reasons before embarking on an expensive computer project that might only produce disillusionment and disappointment.

- *MRP functional capability is important, not how MRP works on the computer.*

When examining the alternatives in MRP, there are two decision levels: functional capability and DP complexity. It is not realistic to divorce one from the other.

Generally, the functional capabilities of most net change systems are similar. Other factors governing your decision are the strength of your supplier, technical quality of the software, availability of support, end-user education and DP implementation.

The system must also be integrated with other DP systems and thus must be modifiable by DP personnel. It must be adaptable to your special needs and to future changes as the system develops.

Buying a package reduces the time, risk and money involved in bringing a manufacturing system "on-stream." A major time-cost component is people, often those you do not have.

When examining alternatives, draw up a checklist of general functional and DP requirements. Make sure the candidates match both areas before proceeding to detailed research.

Lange is product manager, manufacturing, for Cincom Systems, Inc. in Cincinnati.

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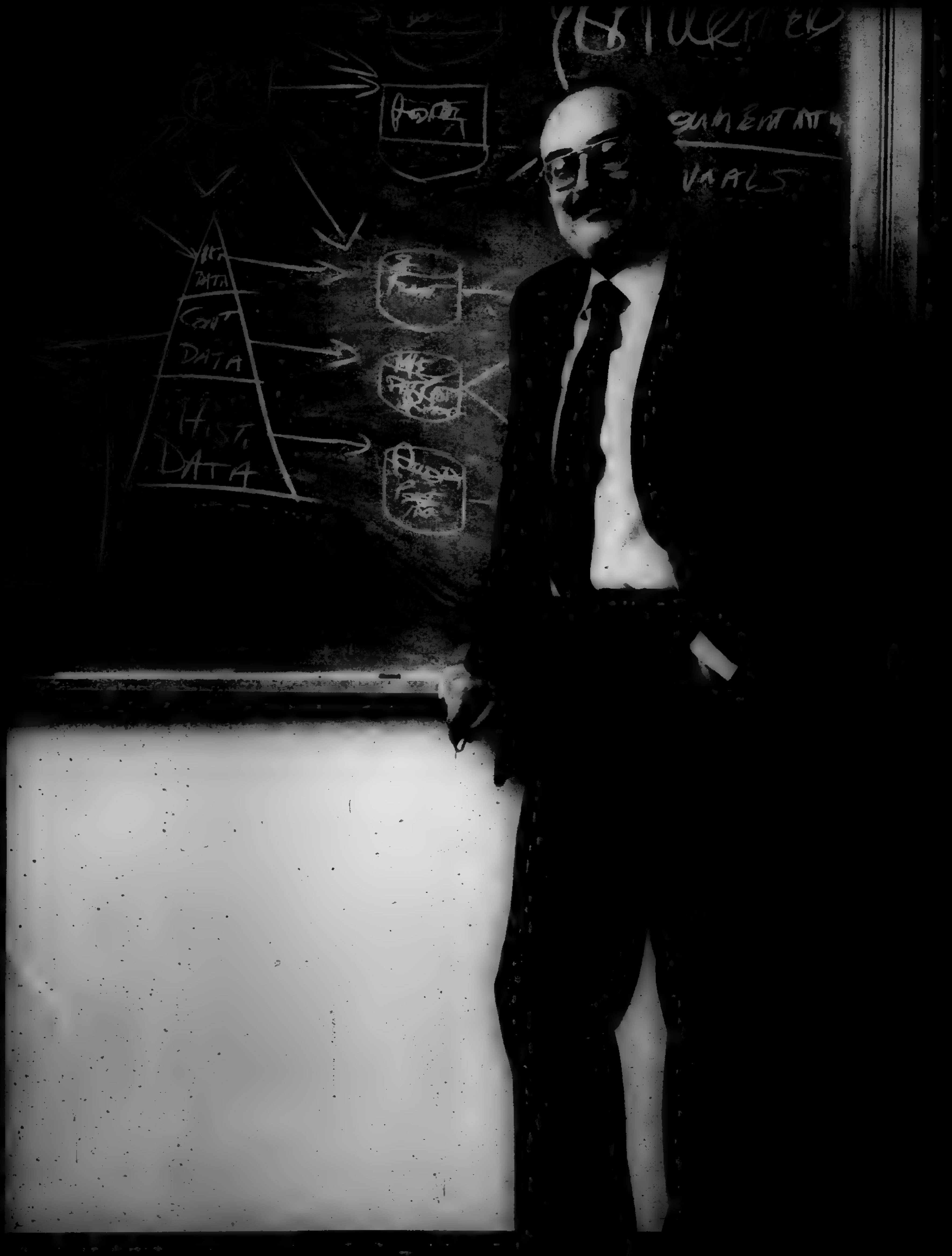
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Responsibilities Interconnected

Users, DP Must Share Package Implementation

By Betty Brodie
Special to CW‡

It is a fact of life that vendors will not hold your hand and lead you through a successful implementation. You and your DP people have to plan and execute it yourselves.

You also cannot expect your responsibilities to end once you install that package. This five-step plan outlines the interconnected DP and user responsibilities for installing and using an application package.

The first step in any implementation is thorough, complete planning. The users first supply business objectives. Then DP people work with users to decide what hardware and software configurations will support the objectives. Because the user base is expanding and diversifying, acquiring a single package can affect a number of user areas as well as the DP department.

A package has to be simple enough to be usable, but robust enough to make its use worthwhile. It may require ongoing education and training throughout installation, testing, operation, tailoring and maintenance.

Basically, the application package addresses three tasks: it provides means for capturing data, tools to manipulate the data and access to the data so that it can be presented in forms that are of value to users. Only the user community can judge whether an implementation is successful.

To users, the performance and throughput qualities of the package are issues. Packages need to fit together as components of a strategic information systems plan. Users seldom care about technical aspects of application software; instead, they are concerned with the form and timeliness of the information it provides. Data processing people's plans support access to and analysis of information, prepare for changes and modification and supply user education and training.

	Planning	Compatibility	Installation	Access	Feedback
Users	Define business objectives Establish performance criteria	Identify user requirements Specify interfaces	Document user procedure Sign off on tested system	Identify access tools	Provide feedback
Data Processing	Determine hardware and software configuration Plan information-systems environment	Define inputs and outputs Manage interfaces	Document operational procedures Control test process Prepare physical environment	Provide access tools	Manage changes and updates

Source: Arthur D. Little, Inc.

Application Package Implementation Responsibilities

During the second step of implementation, DP people define the package's inputs and outputs to assure compatibility with current systems and to enable future expansion. At the same time, users identify what they want from the specific system.

This study of compatibility assures that the package fits together with others or stands on its own. Clear definition of inputs and outputs from the application provides a path for future modifications and integrations, even if users and the DP department presently agree that the application is a stand-alone system.

Another aspect of compatibility concerns the interfaces between manual and automated systems. If the package supports only a limited range of the total functional requirements, interfaces between automated and manual procedures have to be identified and clarified. Users and DP people must agree in order to remove any misconceptions and set proper expectations about what the package will and won't do.

The DP department plans to maintain an integrated system in the long term while preparing single application package support plans for the short term. After a package is installed, the users need to be kept up to date with well-documented, timely enhancements and news releases.

It is critical that the DP department examine the integration between applications in order to recognize, document and manage all interface points. Only in this way will it be possible to maintain data integrity and prevent storage of redundant data.

Integration has to be soundly engineered. It should be designed to make maximum use of computing resources while supplying the data required for input to the application package.

Application interfaces provide pathways to channel data between applications and promote the development of valuable, believable information. The key is to identify the users who create or generate the needed data and to have one responsible data source. This data can then be available for other users and user applications.

For DP, installation means preparing the necessary physical environment to enable the application package to run properly. This preparation may require additional hardware, storage, terminals or printers. It may mean installing communication lines or upgrading facilities. In addition, the application package may depend on some new system software or require technological expertise. This portion of the process is simplified if compatibility issues have been resolved in the planning process.

Installation also concerns defining

(Continued on SR/24)

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Support Needed for Management Software

By Anthony J. Viscomi
Special to CW‡

There are many project management software packages on the market, each with its own bells and whistles, input formats, terminology, screens, reports and some with graphics. However, no matter which one you choose, it will not contain the most essential elements for success.

First, and most important, realize that project management software is not project management. It is not an almighty planner, and it most certainly will not control. In short, it will not manage.

On the other hand, project management software is an effective tool in a complete and comprehensive program of project management. It is most effective where senior management is committed to planning, managing and operating a finely tuned organization. This applies to all types of projects.

How many times has good project management software been installed in organizations that are poorly managed, or lack even reasonable control and where management has provided no support or direction? How many times has this resulted in further dissatisfaction?.

Far too often systems are sold and bought as solutions. They are installed and users are brought on-line. Shortly thereafter management comments, "but our projects are still over budget and behind schedule."

Systems are tools. Project management software is a tremendous tool in the hands of a skillfull planner or dedicated manager.

This sounds apparent, in fact, to some it may seem ridiculously obvious. There are still those who believe, or at least manage their organizations as if they believe, that project management software is a cure for poor management techniques and an undisciplined organization.

Consider several steps before implementing a project management software package.

- Examine your existing organization.

Search in detail to reveal the obvious and subtle objectives, strengths and problems. Determine these on a behavioral level, as well as in product related areas. Analyze how projects are managed now. Perhaps they're not. How are priorities determined? How are project conflicts resolved? Who estimates and schedules manpower? Most important, solicit feedback from various levels of the organization. Ask for improvements and solutions. Find out if your organization lacks project management, or project management goals.

- Adjust the organization to achieve project management goals.

If you find planning skills are weak, then you must educate planners. This might be the time to examine your work-order system, work breakdown structure or standard methodology, or possibly this might be the time to start using one. When this has been done, software can be implemented in a well defined, documented and functioning project management environment.

An organization that is loosely structured and lacks existing management mechanisms will not benefit from a project management software system.

During implementation of project management software, management participation and direction are keys to success. This is where most organizations strike out. Project planning and management must begin from the top down if project management software is to be properly utilized.

Directives must also begin

(Continued on SR/24)

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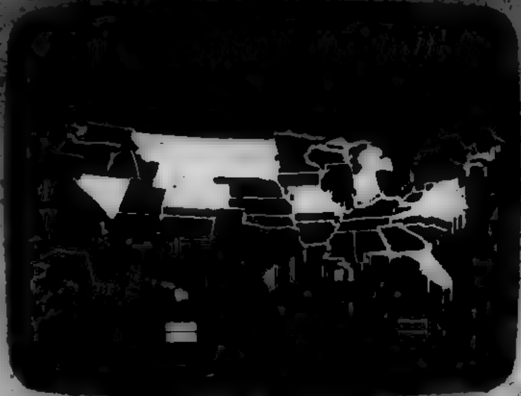

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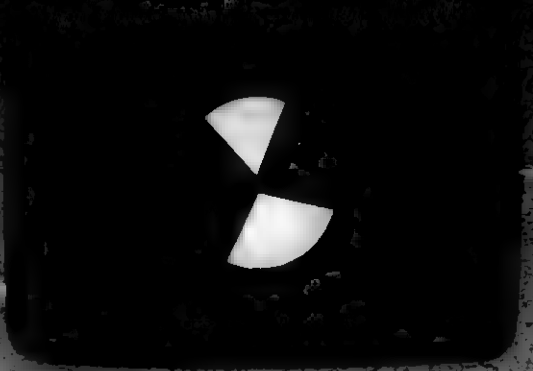

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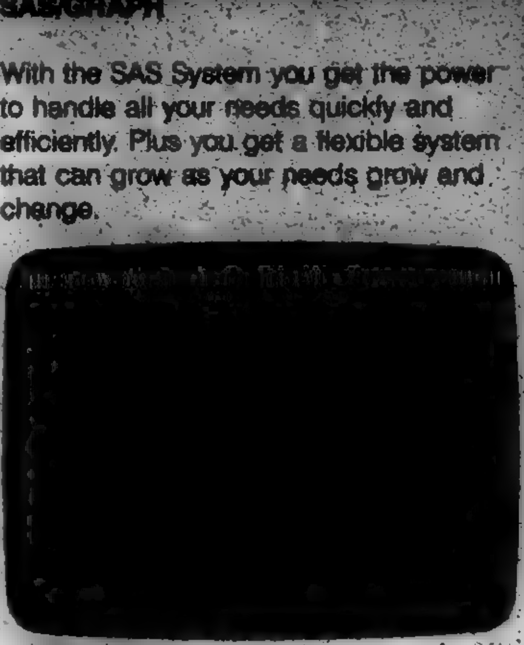

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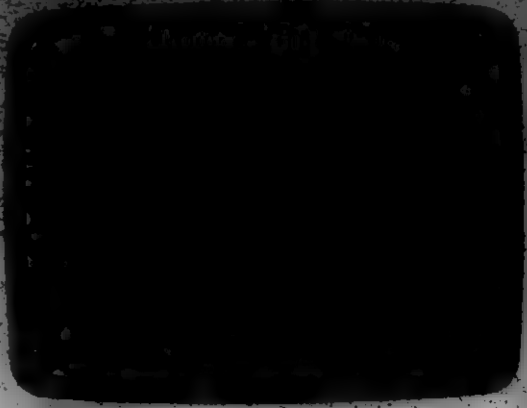

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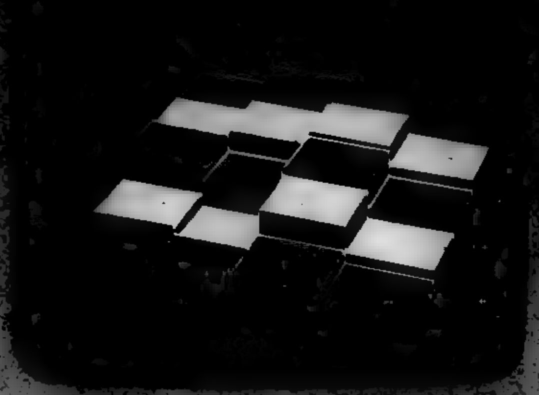

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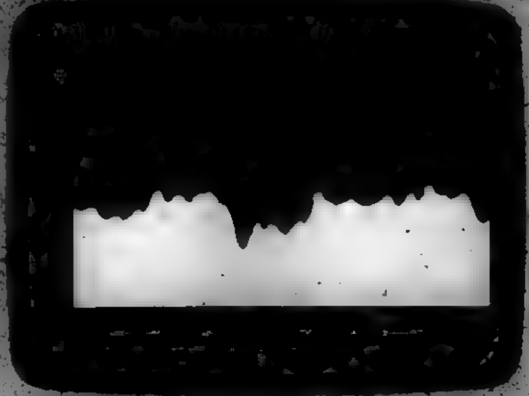

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Users, DP Must Share Implementation Tasks

(Continued from SR/20)

both DP operational procedures and user procedures. DP may have to "fit in" data backup or report generation and distribution. Users who have previously identified their needs for the package now have to match their working procedures with the package requirements. Together, users and DP people test packages to see that they perform acceptably. Only after this joint testing is completed successfully can installation be considered complete.

In the fourth step of implementation, users direct and DP provides. The users' major concern — access — includes all of the users' ways to work with data stored in the system. Access can consist of queries, reports, graphical presentations and/or "what if" questions.

DP supplies software tools to enable these accesses. Often, these tools are part of the application package, but they may also be separate access capabilities supplied by DP.

Users may have specific requirements — for example, on-line, interactive applications — or special timing requirements. Response time needs to be rapid enough so that a user's train of thought is not broken by operating the application. Using function keys instead of line-by-line entry assists in this area.

Users require initial training in the use of the application package. But once the application is learned, they may want to use shortcuts to reduce the interactive process. Multilevel help may meet this need, or the package may require continued interaction with training people until the users become comfortable with handling data entry or screen access.

In the final step of an implementation, users provide feedback about the system and DP people respond with changes. Users issue change requests, reminders and assessments of performance. The DP department controls and manages changes and ensures consistency within the whole system. The DP department must be prepared for change and remain positioned to deal with it since users will continue to determine successful application package use.

Software support is needed to keep the application package up to date. Most packages can be modified to accommodate particular business methodologies or to incorporate additional features. If changes are to be made, they must be made to the source code; however, no individual should make independent changes.

Some modifications may be very costly and time-consuming; they may not be worth the effort for the value they provide. Unless changes are well managed, they can be trouble spots.

In summary, installing an application package is more involved than just making the software available to users. Responsibility must be shared between DP people and users.

In your implementation process, you should:

- Plan appropriate hardware and software to meet users' business objectives.
- Integrate new and existing systems to ensure compatibility.
- Prepare both physical environment and procedures to support application installation.
- Establish appropriate user access.
- Use feedback to manage change.

Brodie is a senior member of the Information Systems Section of Arthur D. Little, Inc. in Cambridge, Mass.

Project Packages Need Support

(Continued from SR/21)

at the top. In one large organization the chief executive officer (CEO) addressed a pilot group of project leaders prior to a training session on their project management software. He clearly stated the corporate dedication to planning and managing and noted that all promotions would be based on the successful managing of projects. In fact, this CEO began his career at that company as a project leader. This is how credibility is established.

One important aspect of the implementation is the education of users. Training classes, understandable documentation, internal user groups and departmental coordinators are necessary to ensure the full and profitable use of your project management software.

In summary, it is necessary to consider the basics. Project management software is not a substitute for good management and skillful planning; however, when properly used, it is a powerful tool helping combine budget overruns, slipped dates and limited resources.

Viscomi is a client manager with International Systems, Inc. in King of Prussia, Pa.

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Complexity Depends on Application

Package Installation Requires Careful Planning

By Peggy LeMoine
Special to CW‡

You have met with user departments as well as upper management, mutually assessed your needs, appraised the offerings of a multitude of vendors, done cost/return studies, made your decision and your new application software has arrived.

Now you can get down to what the whole thing has been all about — installing your new system.

Or can you?

Is the research part of your task over or has it just begun? The answer varies with the type of application you are installing, the degree of integration desired with existing systems and the amount of planned enhancements to the new system.

Applications packages can be classified in the following ways, according to the degree of integration and enhancing desired:

Load and Go Systems.

Unless you have just installed your first computer and this is the first system you are installing, you will not be lucky enough to have one of these.

Word processing packages sometimes fall into this category because the problem of integration often concerns the hardware only. User departments primarily are first concerned with storing documents, retrieving them electronically and increasing the accuracy and productivity of the clerical staff. Mailing list capabilities and other WP-related tasks that require using the existing data base often are not required.

If you have selected a WP package that has file handling and report generator capabilities, it may be necessary to redefine the files using its facilities. This is often a relatively simple task that involves stepping through various menus and procedures that will prompt for record definitions, field names, element lengths and pictures. File definition and setup can be done by clerical staff in user departments. If programmers need to reformat existing data, it should require only simple conversion programs.

Install With Changes and No Integration.

Now here is a system the DP department can really get its teeth into. This system involves existing code, documentation, menus and procedures that require only a few finishing touches. There is no interaction with existing systems and no two-year production backlog. The system requires just one programmer and maybe an analyst to interact with the user department. An easy task — with the application up and running before you know it.

Or is it? Is the documentation as promised? Or is it sketchy, requiring analysis of base source code before changes can be made?

Narrative documentation that is separate from the code may not cover actual programs in enough depth to allow your staff to analyze the system in an acceptable manner. Source code may have to be studied and the interdependency of each program determined before any changes can be made.

This can seriously impact the time needed to get the system up and running.

Install With Integration and No Changes.

Changes and enhancements require definition and guidance from the user departments with the analyst interpreting user needs for the programmers. Integration requires far more participation from the user departments and more time and effort by the analysts to determine how existing procedures and data will be impacted by the new system. If the new package is from the same vendor and has been designed to go with existing installed software, programming changes theoretically should not have to be made.

The possibility of integration without any programming changes is remote, however. Even in adding applications designed to be part of a total system by the same vendor, you may find inherent problems in the new application. It may not have the level of detail provided in the base system.

Pressures of the marketplace preclude long lead times for products. Software producers and vendors provide the heaviest demand modules first.

For the construction segments of the market, payroll and related government and union reports might be offered first, followed by accounts payable and job costing. In distribution, inventory and accounts receivable are the "hot buttons."

(Continued on SR/26)

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What to Do When the New Package Arrives . . .

What do you do when the new software package arrives?

The first step is to review and reevaluate the system.

- Is it truly load and go? If there is even the most remote possibility that the new system will interact with existing systems, data elements should be reviewed for compatibility.
- Are changes needed? Now is the time to make them. Review and schedule as necessary. A short delay in installation now can save time and money later.
- Will the system be integrated with existing software? If immediate integration is necessary, are the systems truly compatible? Are data elements the same length and type, and are features in the existing system replicated in the new applications? If not, this system needs not only integration, but changes.
- All points of the system should be reviewed in depth to determine that desired features are available. The best way to do this is to get the system up and running. Not only will this make management happy, but the users are sure to find any shortcomings.

Application review and comparison before the package comes in-house is the ideal. The reality is that it is unlikely that all points will be covered until the application is actually being installed and the end users have a chance to review the programs and procedures by working with the system. Errors in code and deficiencies in design are often not apparent from the demonstration runs prepared by the vendor. The best review and assessment comes from utilizing the system.

If possible, insist that the vendor give you a period of time in which to review and, if necessary, reject the package. This will ensure that you can assess the system under the most stringent conditions.

This is not always a viable option, so it is then even more important that all major points be covered in the in-house review. The system is yours, whether or not further review shows that it is truly what you want. Failure to prepare for system deficiencies, or correct them, is worse than not installing the new system at all.

Getting Ready For Installation

(Continued from SR/25)

In both instances, if the detail is computerized, it is relatively simple to extract figures for the general ledger, so this might be the least item in demand.

Software houses, responding to these various demand levels, would produce the general ledger package last, almost as an afterthought, and might not build the features demanded in the earlier systems.

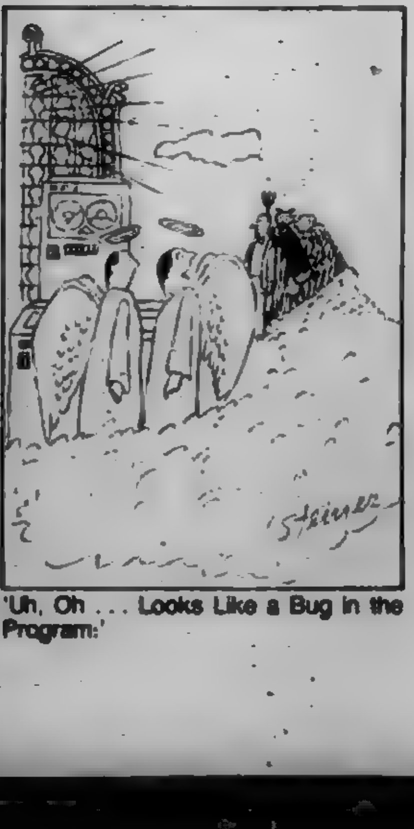
Install With Integration and Changes.

Even with vendor-integrated applications, changes are sometimes necessary to conform to modifications made in previously installed modules or to enhance the base system.

The ideal system utilizes a single data base with repetition of user function for ease of learning and has user-defined parameters for the maximum number of functions possible. It is doubtful if anyone has achieved these lofty principles, but every management information system should have these as the ultimate goals.

Integrating a package can require almost as many resources as a "scratch" in-house system. The most basic functions will be in place and should require only minimal programming changes, if any, to accommodate changes and enhancements. Otherwise, you have picked the wrong system.

LeMoine is vice-president of finance for Swengel-Robbins, Inc., a pipeline construction company located in Scottsdale, Ariz.



'Uh, Oh . . . Looks Like a Bug in the Program.'

Software Integrates All Systems

Phoenix Package Manages City Finances

PHOENIX — Like many Sun Belt cities, Phoenix has benefited from an influx of people and business in recent years. As the city grew to become the ninth largest metropolitan area in the country, officials began to look for a large computer system and application software to better plan, control and report the city finances.

A request for proposal developed in July of 1981 specified compatibility with a large Honeywell, Inc. system and state-of-the-art data base and communications techniques. The targeted starting date was early December 1981 with an implementation date of July 1, 1982.

Functional requirements included the adoption of a new and expanded accounting code structure, a base budget system, management reporting, detail audit reports and balancing features, on-line inquiry and input capabilities, improved accounts payable functions and an increased level of supportive detail data, according to Michael Norman, Phoenix project leader for the Financial Management System (FMS).

Norman's team planned a "Detail Requirements Review/Planning" milestone, including training, software package installation and test, systems tests, forms and procedures development, start-up and implementation and a postimplementation audit.

Peat, Marwick, Mitchell & Co.'s Famis package was selected in September from three bids submitted. Review sessions, geared to understanding the Famis package, were conducted during October and November 1981. Detail modifications and enhaneements were defined and tagged either "mandatory" or "desired," according to priority.

The city refined the project organization to include a steering committee, project director, project manager, project consultant, user project leaders and a management information systems (MIS) project leader.

By December, a software conversion effort was under way to modify IBM CICS programs to Honeywell Idsii/DMIV data base program and files. In many cases, logic rewrites were required, which turned out to be more difficult than expected, Norman said.

Meanwhile, the project team was wrestling with scope, objectives and priority issues. As requests for modifications and enhancements increased, "we jealously protected the base-line package from any but the most essential modifications," Norman said. "All enhancements and lower priority modifications were assigned with separate resources and moved out of the July 1 critical path."

The most significant "enhancement" was the issue of integration, Norman said. The city of Phoenix had 12 automated systems that would interface with, and provide input for, the financial software package. The question was whether the interface would be a conversion of old to new codes — either a "full interface" requiring all originating systems to be modified to input and process the new financial codes, or some type of a compromise between a purely back-end conversion and full integration.

The issue of integration was independent of the software package both functionally and contractually, Norman noted. Yet upper management had originally envisioned a fully integrated system in the initial implementation.

With advice from Janett Smith of Peat, Marwick, Mitchell and after resource and objectives identification and analysis, a decision was made in December to fully integrate all current systems with Famis. The July 1 implementation target date remained unchanged, although the degree of effort increased from six to 24 full-time employees to modify the 400-plus programs and achieve a totally integrated FMS.

In January, as the IBM/Honeywell conversion was nearing completion, the city revised its project plan and staffing. The MIS staff was organized into five teams with senior staff responsible for specific and discrete tasks. Detail plans were developed and reviewed with each team, then summarized for the project team into a number of key deliverables or tangibles.

By March, Famis had been converted to Honeywell, and a data base technology and the basic software had been tested. User training and working sessions continued, and forms changes and data entry procedures were defined. Over 100 forms were revised and reprinted.

(Continued on SR/30)

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Firm Learns Value of Backup

LONDON — In choosing software packages, support and service often take a backseat to the search for flexibility and functionality. But users shouldn't neglect to focus on support and service.

United Medical Enterprises, Ltd. (UME), a London-based company operating internationally in the health care market, learned this lesson the hard way. The firm initially purchased an accounts payable subsystem from a UK vendor firm and the company was having "after-the-sale, how-do-we-operate-it blues."

The fault did not lie with the initial purchasing decision, but with the problems incurred once the system came in-house. The transition was anything but smooth, and left UME's DP professionals and users with a good, solid system without vendor backup, according to David Williams, DP manager for UME.

Williams explained it this way: "After an extensive look at all the software products in the UK, we settled on this accounts payable subsystem. The system proved difficult to operate. This was surprising to me because I thought we had purchased the best system available in the UK."

Williams still feels the system itself is good, but "the people who came to install it were not up to expectation. So much so, that I began to doubt their ability."

UME then made the decision to suspend implementation with this particular vendor firm. At that point, UME needed an accounts payable system and needed it fast. It had already exhausted software resources in the UK and, because time was of the essence, it couldn't begin another lengthy evaluation process.

Williams attended the 1982 annual Hewlett-Packard Co. users group convention in San Antonio, Texas. "While there, I learned HP's General Accounting Package had been developed by Collier-Jackson, Inc., a Tampa, Fla., firm.

Williams called a Collier-Jackson marketing representative. "Because we knew exactly which parameters we needed, I realized from the phone conversation Collier-Jackson's FPS/3000 would meet 80% to 85% of our needs," he stated. "But I couldn't rely on a sales pitch alone, so I made immediate plans for me and our disbursements accountant to make an on-site visitation."

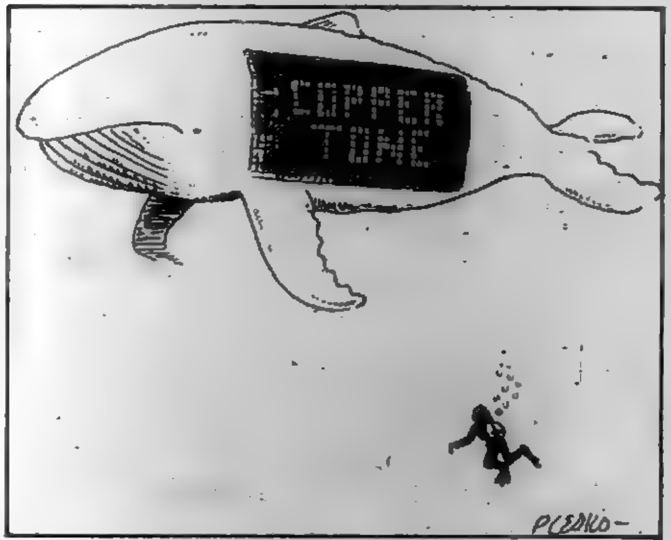
Decision to Purchase

UME made a decision to purchase Collier-Jackson's accounts payable system during the initial visit. The solution to its problems included systems education, maintenance and support.

UME was undergoing a complete staff change in its accounts payable department. No parallel run would be permitted because the company stopped all input into the old system, paid its outstanding invoices and shut the old system down.

Collier-Jackson's on-site installation team not only had to get the system on-line and new people trained, but also had to rebuild UME's confidence in software vendors at a time when the old adage, "Let the buyer beware," was up front in the minds of UME's DP professionals and users.

For a new computer system, the implementation period was remarkably fast, Williams said.



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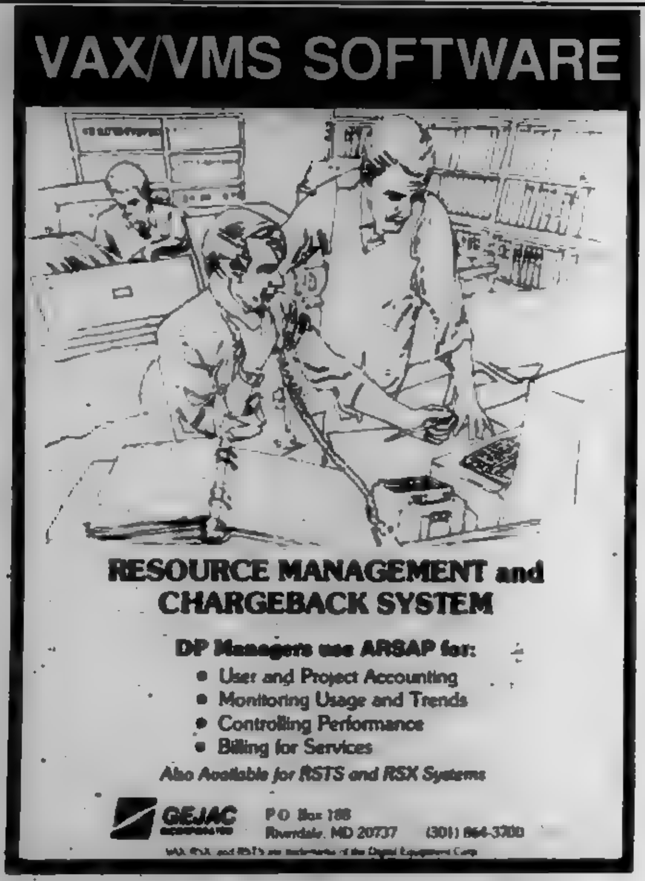
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Recently, the Merlyn Corporation completed the industry's first exclusive study* on eight available ADS software systems. And this study clearly confirms what Cincom users already know. MANTIS is decidedly the winner.

Among the three most widely used systems—MANTIS, DMS and UFO—MANTIS *led every user satisfaction category:* productivity enhancement, on-line performance, ease of learning, ease of use, documentation, support and reliability. And in the most important category—"Overall Capabilities"—MANTIS was again the winner.

User satisfaction? 33% of DMS users said they would *not* recommend their system to others. Among UFO users, 6% would *not* recommend theirs. For MANTIS users, not one single user said no.

Further evidence of MANTIS' superiority is the overwhelming industry acceptance. In only 18 months since its introduction, MANTIS has gained 11% of the total ADS market share. That's a substantially higher growth rate than all of the other seven systems studied.

But while we're very pleased to be the runaway winner, we're even more pleased that MANTIS is becoming the industry standard for on-line programming. 84% of MANTIS users develop 91-100% of their applications with the system. Only 67% of DMS users reported such high usage. With UFO, the figure plummeted to only 48%.

These are merely the highlights of the conclusive Merlyn Study. But the findings are clear. When it comes to application development systems, MANTIS is in a class by itself.

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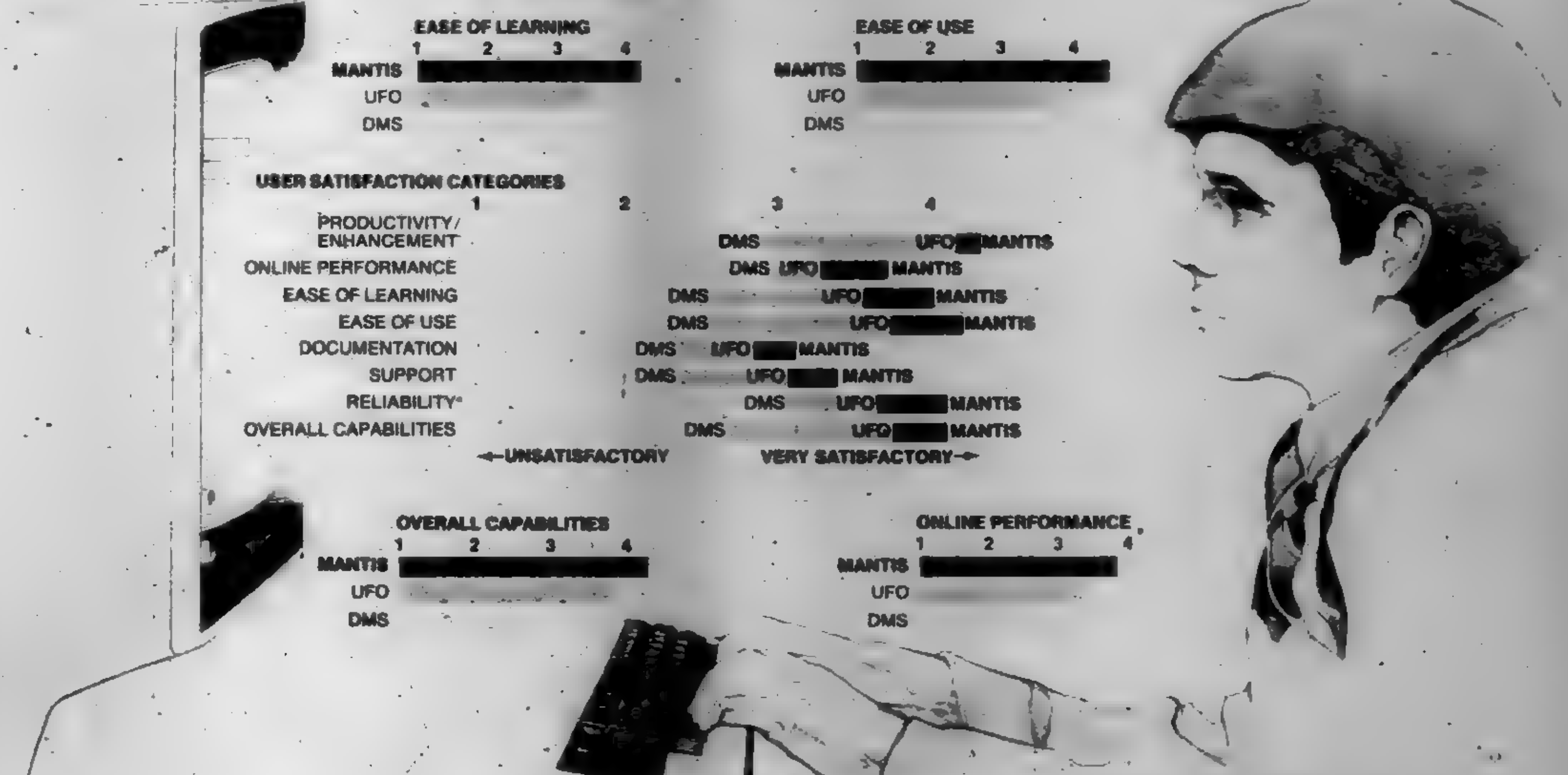

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Manufacturer Profits With Accounting Package

OSHKOSH, Wis. — "Anybody's box can add, subtract and crunch numbers," Patrick Esslinger of SNC Manufacturing Co., Inc. here said. "What a buyer needs to ask is: 'How much effort will be involved in modifying this company's software so it will do things the way *we* want to do them?' "

As Esslinger sees it, users are now much more aware than they used to be, recognizing that the software the manufacturer delivers with its machine, or the software that it purchases elsewhere to run on the new system, is tailored so it is more or less suitable for everybody. "It's the 'more or less' that's the Catch-22," he said. The process of adapting the programs to meet the company's specific requirements may take months and can be the most frustrating part of the process.

The answer, according to Esslinger, is to make the question of software flexibility a major factor in the computer purchase decision.

SNC Manufacturing produces customized electrical transformers, especially for use in the control of computers and medical equipment. Started in 1946, the company now has 250 employees, divided between the main plant in Oshkosh and a second production facility in Emmetsburg, Iowa.

In June 1980, SNC purchased a Basic Four Corp. System 610 from Management Assistance, Inc. and a software package called Profit from Computer Methods. The main reason for the latter selection, according to Esslinger, was that Profit software

(Continued on SR/34)

Phoenix Grows With Financial Package

(Continued from SR/27)

"As May drew closer, our pace became more intense," Norman continued. All but the high-impact and most beneficial enhancements were deferred so as to maximize resources available for the base-line Famis and integration effort.

One of the enhancement objectives was the development of a budget system to replace the former preparation and monitor budget system. Also, approximately 15 reports, a communications security module and five inquiry screens were added. This was accomplished with separate resources justified individually and operating outside the path of the integration/base-line software implementation, Norman noted.

By June the city was system-testing the software and most of the interfaced systems. Slippage had occurred in a few of the current systems to be modified and integrated and in the accounts payable subsystem of Famis. Some problems were related to fine tuning the data base and to increasing file sizes that were originally underestimated. "We were overwhelmed with high-volume test results, but worked with the users to review specific results based upon defined discrepancies," Norman said.

Recognizing that testing could continue indefinitely, the project team determined that all critical test results had been reviewed and approved. The Steering Committee concurred and the FMS project was implemented July 5, four days behind target.

There were very few application program errors at implementation, few training or input problems and modifications to the current system appeared to be complete and effective, Norman said. "This was a result of Peat, Marwick, Mitchell and our staff's diligence," he said. "There were some anxious moments in July and August, such as delays in shaking down some interface programs and processing times that exceeded one shift. However, the implementation generally occurred as anticipated and planned."

The DP staff remained until October, developing additional reports and budgetary enhancements. The entire project achieved a variance of within 10% of its planned vs. actual staff and cost.

"In my opinion, the greatest advantage to purchasing and implementing a software package is that it encourages modifications to take a lower priority to the implementation date; hard decisions are forced. The greatest danger is to underestimate a software package implementation effort — to gloss over the requirements and objectives, to minimize resources required and to underestimate the desired modifications and enhancements. Packages are a double-edged sword, result-oriented, but so easily underestimated," Norman said.

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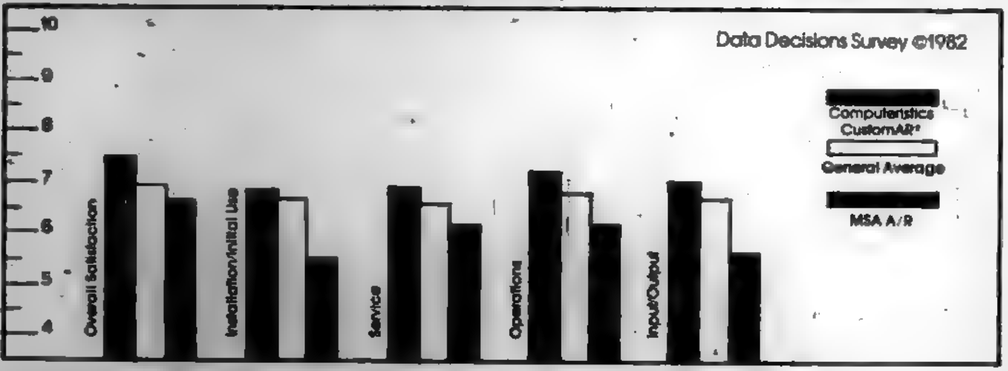

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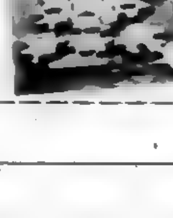

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Food Chain Chooses In-House Package

SUNNYVALE, Calif. — Add Disneyland and Disneyworld together. Divide the sum into neighborhood amusement parks complete with computer-driven characters, video games and dozens of children's rides. Offer pizzas, a salad bar, beverages and an assortment of hot sandwiches.

What do you have? Chuck E. Cheese's Pizza Time Theatres, established by Atari, Inc. founder Nolan Bushnell. About 200 outlets already dot the U.S., with additional stores opening at a rate of two per week.

The corporation is mushrooming so rapidly that since incorporation in 1977, it has expanded to 7,000 employees, outgrowing its Bay Area headquarters nearly once every year. Yet it recently faced the prospect of picking a new information processing system that would stand up for five years or more.

"We had reached a crossroad," John Impson, Pizza Time's vice-president of manufacturing, explained. "We had been using two sources — Xerox [Corp.] Computer Services for on-line processing for our manufacturing and distribution data while a local service bureau provided processing of our financial matters, mostly on a batch basis.

"Unfortunately, the service bureau could not keep pace with our needs. Three to four weeks often elapsed from close of month to delivery of corrected key reports important to us and to our financial department."

Late in 1981, the company invited bids for a new, combined service. The request stressed the importance of application software that could be run initially as a service and then transferred to in-house hardware.

According to Impson, system inte-

(Continued on SR/38)

System Eases Changes for Manufacturer

(Continued from SR/30)

could be modified.

SNC previously had been using a system that was dedicated to handling accounting chores only. The firm had recognized a need for installing a computer system for production control as well.

Citing examples of Profit's flexibility, Esslinger explained that its files have been set up with open fields, so that if the user has to hold an extra piece of information, the open field already exists. SNC was concerned with the time that was being taken for order processing. To understand where the delay were occurring, the company added a capability for tracking each order through the system to the software program, recording in whose hands a particular order was at any moment, how long each person had it and so on.

Another important change was the inventory package. For tax reasons, the company operates on a "last in first out" basis, and the process of modifying the software from the more common "first in first out" was simple to do. "I think with most other software packages," Esslinger explained, "that kind of change would have been an enormous problem, the kind of situation where you get to wondering if maybe it's easier to change your business practice than change your software."

SNC's original system, the Basic Four System 610, offered 96K bytes of main memory, two 35M-byte disk drives, four terminals and one 300 line/min printer. From the time it was first installed, the system provided the company with added capability for scheduling and monitoring production and integrating the accounting and job-control functions.

To ensure a smooth transition to the world of computers, SNC established a computer steering committee to explore the field and select a system. This committee was made up of the company's top-level managers, which created a means of getting involvement and support from every department. The existing staff was trained to use the new system and, according to Esslinger, "people were enthusiastic because they saw it would make their work easier."

In the two years since installing the original system, SNC has upgraded to a Basic Four System 730. The removable-pack disk drives were converted on-site to units with 75M bytes each, a total increase of 80M bytes of memory. The main memory was increased in increments to the present 288M bytes. The number of terminals has been increased to 16, including two terminals used for word processing as well as data processing.

"Another feature of this system is that it can be upgraded so easily. We've already doubled the capacity, and we can upgrade still further from here — all on-site."

The Profit software has produced some advantages that SNC had not expected. For example, the firm now uses the system for performing selective marketing analysis. "We crunch through the sales data and find what types of transformers are selling the best. Then we go through the customer data base to find similar types of customers who might be interested in buying that same type of equipment," Esslinger said.

In addition, the company designers have simplified the product line by having the system review the engineering data to discover transformers with similar design functions that could be combined.

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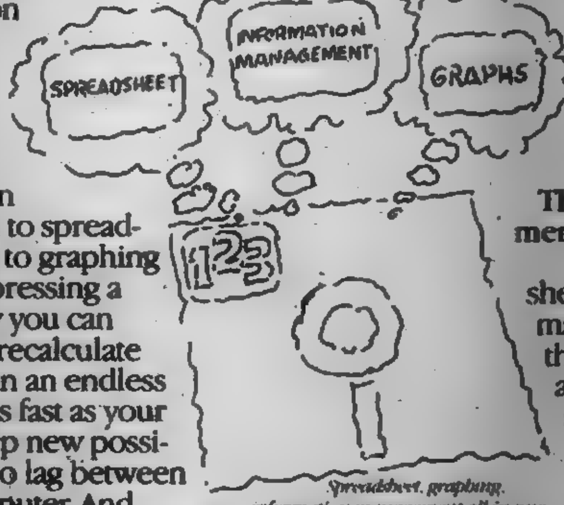

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Food Chain Motivated to Integrate

Chuck E. Cheese

(Continued from SR/34)

gration was one of the most significant user requirements requested of the software supplier. "For example, efficient inventory management is vital to our profit picture," he noted. "Yet when we had separate financial and manufacturing systems, we found it impossible to resolve differences in inventory records."

About one-half of the Pizza Times are company owned; the others are franchised. But virtually all follow similar merchandising.

After deliberation, Pizza Time let a contract to Xerox Computer Services for the Xerox Manufacturing System, an integrated package of manufacturing, financial, distribution, marketing, engineering and procurement functions. The software is compatible with all IBM 370, 4300 and 30 series computers and operating systems.

Load Expected to Triple

For three years, Pizza Time used the Xerox Computer Services on-line service consisting of six major application programs: accounts receivable, cost planning and control, inventory management, order entry and invoicing, sales analysis and material requirements planning. But the load on the integrated system was expected to triple when financial services were added.

Communication with Xerox's Los Angeles data centers was accomplished with three Xerox 1350 minis, 26 Xerox 1340 terminals and four slow-speed line printers, according to Steve Merchant, Pizza Time's management information systems director.

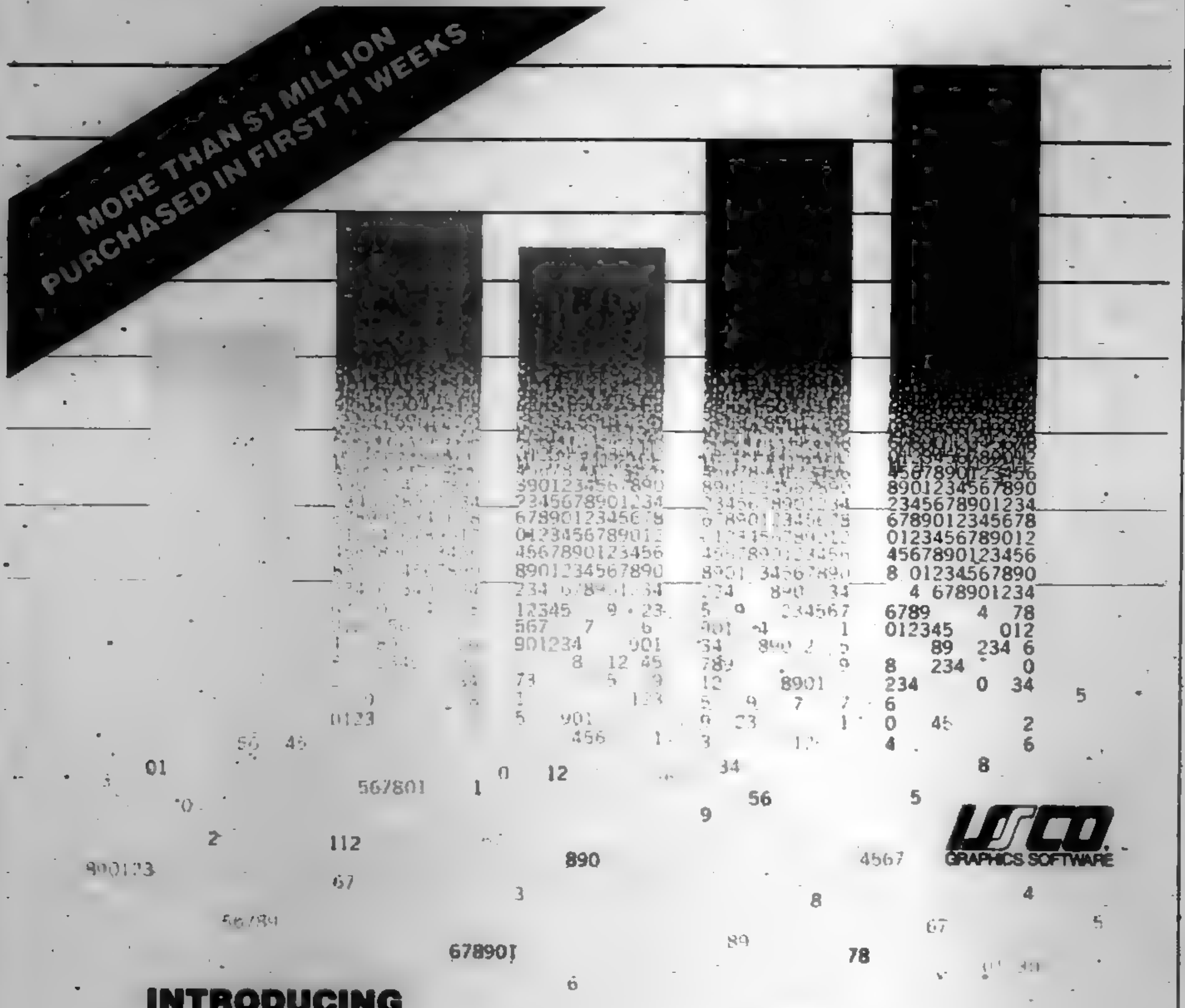
"Under our new contract with Xerox," Merchant explained, "they are providing the new Xerox Manufacturing System with procurement management and master production scheduling, as well as fully integrated financial systems for general ledger, accounts payable, receivables management and fixed assets."

By mid-February 1983, Merchant was expected to have his IBM hardware installed. The mainframe selected was an IBM 4341 Model 11, with 4M bytes of memory. Peripherals will include three 820M-byte Model 3375 disk drives, two 3420 tape drives, one 3203 1,200 line/min line printer, one 3705 communications controller, four 3274 communications control units and 40 3278 and 3279 terminals serving four different company locations.

Merchant's department is also responsible for the timekeeping and other functions of a point-of-sale system in each company-owned store. To poll and process store data, Merchant uses a Digital Equipment Corp. PDP-11/24 system.

"With this approach, we can move the Xerox software in-house with a minimum of risk," Merchant said. "And the Xerox software can move across IBM product lines, so we will be able to stay with the same software even if we change processors."

Admitting that Xerox Computer Service was not the cheapest proposal considered, Impson ventured that system integration and future expandability had been weighed at least as heavily as short-term payback. "If we continue to grow at our present rate, we may have problems by 1985 or 1986," he said. "But they'll be hardware problems, not software."



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Manages Personnel Information for 30,000

PMS Package Ups 'People Productivity' for Firm

SAN FRANCISCO — A software package is helping the Bechtel Group of Companies manage its most valuable asset — people — during this difficult economic time.

According to Sidney H. Simon, manager of personnel information systems and procedures, the firm's central personnel department has "set the standards for the company" and ensured that the "personnel function has the tools to do the job."

The package the firm is using is Tesseract Corp.'s Personnel Management System (PMS), which was implemented under Simon's direction on an IBM 3033, Bechtel's internal computer.

Bechtel has progressed from a centralized data capture and reporting personnel function to decentralized updating and reporting. The firm has eliminated the filing and retrieval of approximately 36,000 documents, freeing people to perform more interesting and productive jobs, Simon explained. In the process, the quality, timeliness and availability of personnel information has reached an all-time high.

It is a real benefit to "obtain information close to its source and have information where it needs to be," Simon said, adding, "that means the decentralized division personnel organizations are directly responsible for their information."

Before PMS

Before PMS, the automated personnel system ran weekly updates, and all personnel information for the nearly 30,000 worldwide Bechtel employees was processed by central personnel. Fifteen full-time clerical people were responsible for receiving the information from the divisions, preparing it for keypunching, auditing error reports and making the corrections the following week.

The old system provided monthly reports. "The timeliness and accuracy of information was totally unreliable," Simon said. Many operating divisions would send personnel changes near the end of the month. If there were errors in the input, the information could not be corrected until the following week. However, reports were still generated at month-end so correct data might not appear on the reports until the following month, he explained.

Today, most personnel information is input by the operating divisions. "We want to collect the information as close to the source as possible," Simon reported.

The central personnel clerical staff has gone from 15 full-time employees to six employees who have numerous job responsibilities, only one of which is to maintain this personnel information for the centrally processed Bechtel divisions.

The operating divisions had reservations about decentralized processing, Simon said. They believed that it would mean additional responsibilities and staff. "We have proven that there have been no additions to anyone's decentralized staff for either reporting or data entry. Instead, job content has been enriched through the use of terminals rather than typewriters," Simon said.

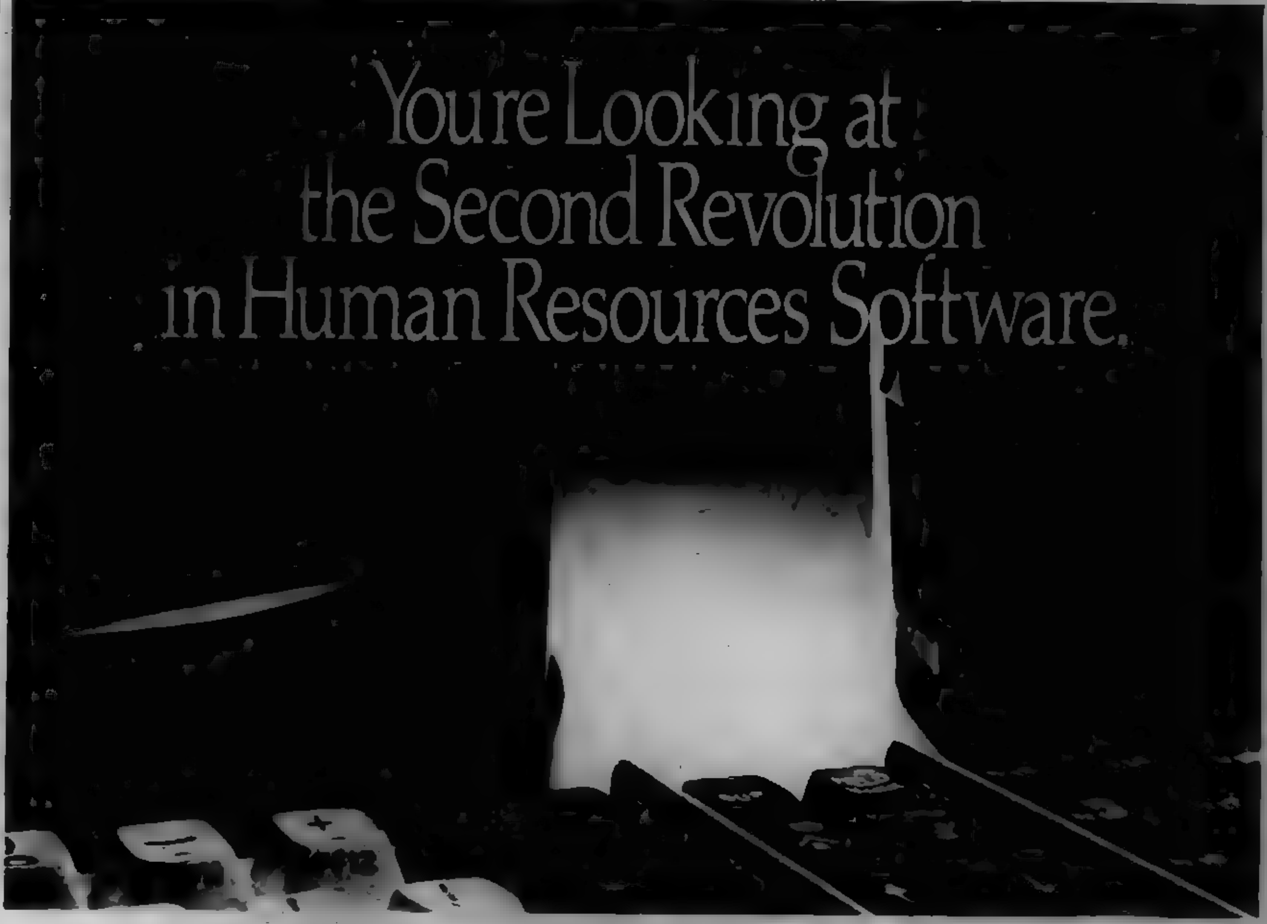
Since his department is responsible for personnel procedures as well as the PMS, when the decision to decentralize was made, Simon's department prepared the operating divisions. "We reviewed their existing procedures, then showed them how their procedures would and should change to do the job better using the system. We were able to identify one-half of a person here or one-quarter of a person there to perform the specific functions," he said. It took less than two days to train people to perform the necessary personnel functions in PMS.

Central personnel maintains control of the system and serves as a single source for companywide personnel information. Only this department can access the entire Bechtel employee file. Simon's group determines what information can be read and updated by each user of the system, so decentralized divisions only have access to their employees' information.

Updating employee information has been streamlined from what it was before PMS. "In the old days," Simon explained, a clerk had to go to an employee's file, extract the document from the last action update, have the change made on the document, obtain the necessary approvals and send the document to central personnel where information would be updated weekly.

Simon described today's updating procedures this way: "When an oper-

(Continued on SR/40)



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Firm Strikes Oil With CPU, Accounting Package

OKLAHOMA CITY, Okla. — What does it take to achieve a successful installation of a software package on a newly acquired CPU?

At Clements Energy, Inc. (CEI), an oil and gas exploration and production company here, the three key factors were "the dedication and teamwork of the implementation project personnel; the proven performance of the hardware and software; and the "excellent communications maintained" between the CEI and the software vendor.

Contracts were signed in February 1982 to purchase a Hewlett-Packard Co. HP 3000 Series 40 computer and Petroleum Software Systems, Inc.'s (PSS) Integrated Petroleum Accounting System. CEI and its parent company, Nerco, Inc. of Portland, Ore., had conducted an extensive requirements study and mutually agreed this would be the best combination to meet the needs of the growing company, senior systems analyst Shirley Handley explained.

"Organization of the implementation project team and planning the strategy became a logical extension of the cooperative spirit that had prevailed during the requirements study," Handley said. CEI had been using an outside service bureau to process accounts payable, joint interest billings, accounts receivable and general ledger for about a year. The firm had been less than satisfied with this service, and other areas it had hoped to automate were still using manual systems.

CEI management recognized the need for DP expertise from the corporate management information systems staff, and CEI personnel were highly motivated to participate in the implementation to assure an accounting system that would work well and allow optimum control of schedules, she explained.

The scope of the project and a very aggressive schedule was dictated by management, Handley recalled. The priorities were to convert the service bureau applications as quickly as possible, to automate the manual revenue distribution process and to phase in expanded accounting capabilities. Nine comprehensive accounting modules were to be up and

(Continued on SR/42)

PMS Package Improves Productivity of Personnel

(Continued from SR/39)

ating division wants to process an action, it prints a document with the current information then and there. It makes whatever changes it wants to, gets them approved and inputs these changes to the system. The division doesn't print another turnaround document until the next action is required. The result is you are never going to the file to get a document or putting one back in the file for next time — the system is really used as a file cabinet."

For Bechtel, the prime benefit of PMS "is improved performance of the personnel function." Bechtel's future plans include greater use of PMS.

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Firm Handles Contracts With Project Manager

ST. LOUIS — A project management package on a minicomputer helped J.S. Alberici Construction Co. here handle more than $800 million in new contracts in 1982.

One of the largest general contractors in the country, Alberici uses T and B Computing, Inc.'s Track 50 project management system, which runs on Prime Computer, Inc. 32-bit minicomputers.

After a thorough investigation of many systems by a special Alberici task force, the Prime/Track 50 combination was found to offer the most effective solution.

The Alberici installation was configured with a Prime 250-II with 2M bytes of memory, 300M-byte and 96M-byte disk drives, 1,600 bit/in. magtape, California Computer Products, Inc. (Calcomp) and Zeta 4-pen plotters, Calcomp digitizer, terminal workstations, printers and extensive digital communications equipment.

System's Challenge

The system's challenge was to aid project management in a successful and growing organization where employee productivity was already high and business practices innovative. Results have been extremely beneficial, according to Gene Novacek, manager of Alberici's Management Information Systems Department.

"The system has to have the flexibility to let us extract only what we need from an extensive bank of project information. All too often, management gets flooded with too much information, which clouds the decision-making process. A high degree of organizational and summarization power is also necessary to present the information in a consistent, understandable format. The Track/50 Prime combination gives us this and more," Novacek explained.

Alberici has been able to meet the challenge of an important industry trend — combined cost and scheduling of project management systems. Controlling large-scale building projects means the company may be responsible for overseeing as many as 250 subcontractors with monthly billings as high as $40 million; and often, there are many large-scale projects going on at the same time.

"Getting subcontractors to agree on a monthly invoice amount was tough enough, let alone trying to get them to work with us as a team," Novacek said. "Voluntary information from subcontractors can be very valuable in projecting time and month problems. Our procedures actually help to kindle a team spirit among all parties and maintain that spirit over the course of a project. The by-products of this effort are 'meaningful' schedule projections, cash flows, manpower and resource requirements, not to mention valuable historic data."

"The accuracy and timeliness of our information means project managers and engineers can be more effective in preventing problems before they occur, thus creating a more controlled project environment to everyone's benefit," he added.

Terminals, printers and even graphics plotters are often installed on-site at large construction jobs. Prime's communications capabilities and the Primenet networking facility are being used for remote accessibility. The 2780/3780 emulator and remote job entry workstation facilities are also used to link the Prime 250-II to an IBM 4331 used for payroll, gen-

(Continued on SR/46)

Alberici's Novacek compares status data against milestone schedules.

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Oil Firm in the Black With CPU, Package

(Continued from SR/40)

running by year-end.

Meanwhile, lease-records personnel were concentrating on organizing manual records in preparation for implementation of a major lease records module to support management of an inventory of more than 5,000 leases.

CEI constructed a computer facility, installed the HP 3000 and completed all off-site education by April 23. Key project personnel spent four days in mid-May at the PSS offices to complete a 50-page questionnaire that was to become the single most important piece of documentation.

"Listed in one small binder were all the decisions that made our system unique from any other PSS customer," Handley said. "The ball was now in the PSS court, as it built all the necessary system-control tables and methodically checked the results of the tailoring with the same test data we had seen demonstrated in our training classes."

The petroleum software systems package was installed on CEI's computer on June 23, and the installation accountant spent two days reviewing the results of the acceptance testing with CEI's personnel.

The next milestone on the critical path was an August parallel for the service bureau applications. "Not only did CEI make its August deadline, but the parallel went so well that those applications moved into production on the in-house computer as of September," Handley said.

Revenue distribution completed a test cycle, duplicating a full month's manual checks, and went into production in October. New capabilities continued to be phased in through the remainder of the year. At year-end, 85% of the accounting processes were in production, Handley noted.

A great deal of behind-the-scenes planning went into reducing effort to the bare-bones minimum necessary to achieve the desired result, she said.

The implementation approach included a philosophy toward program changes vs. a project enhancements log, file custodians and file conversions, responsible users, the test account, shakedown testing and the PSS Phone-In Consulting Service.

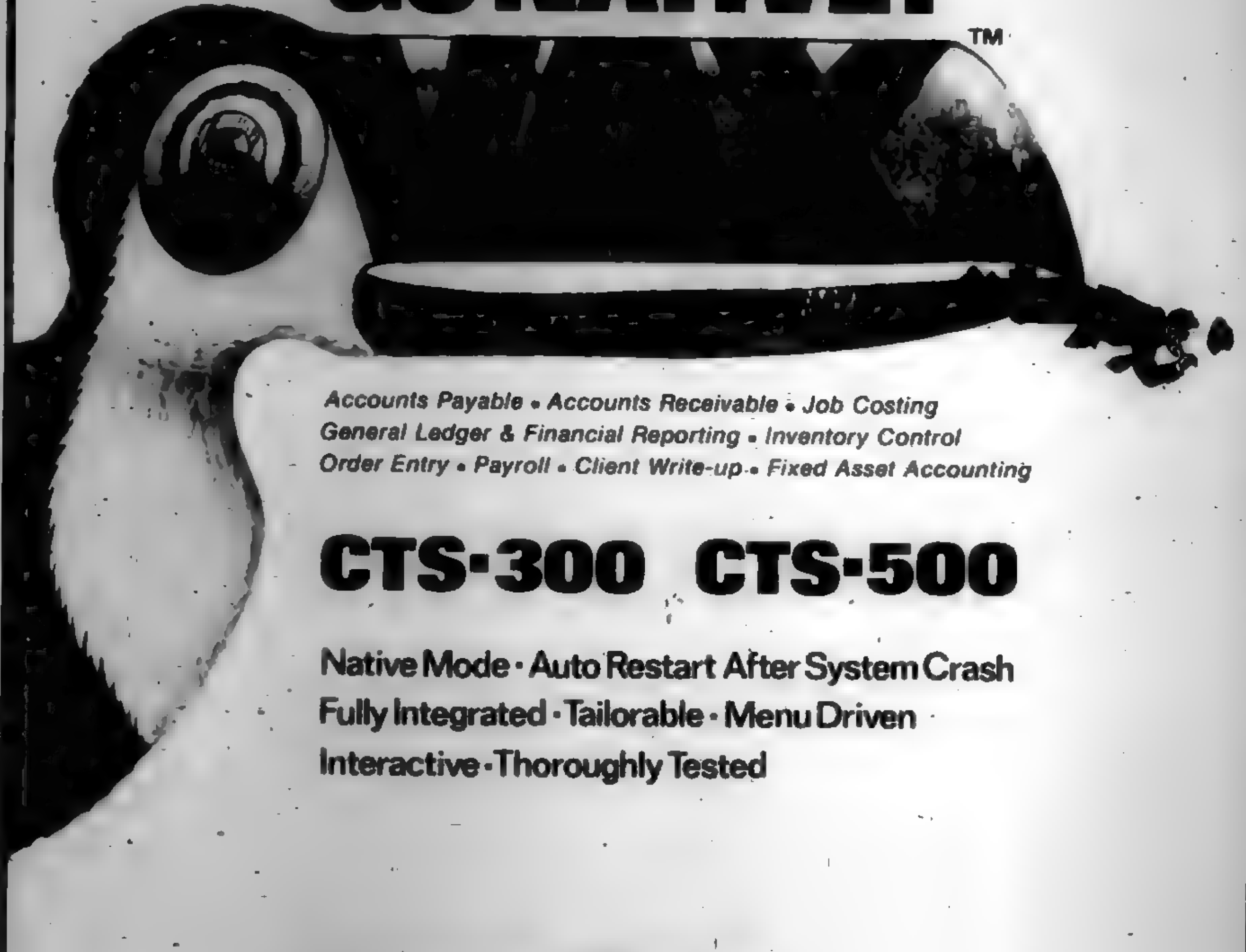
'As-Is' Basis

Because DP production systems were desired in the least amount of time, management made a decision to implement the software as closely as possible to "as-is." The minor modifications that were required were accomplished by PSS with fast turnaround times, either under warranty or within the provisions of its program product support agreement, Handley reported.

An appropriate user was assigned to be file custodian for each file required, having responsibility for his data being ready to use by an assigned due date and also for preserving the integrity of that file's ongoing maintenance in the production environment.

The vendor's acceptance testing proved that the tailored software installed on the CEI computer had worked with PSS test data, Handley said. When the structure was installed for live data processing, an identical test environment was created. DP people were assigned to do "shakedown testing" in the test account with representative samples of live data.

"By the time jobs were moved into the production account, there was a high degree of confidence that they would operate correctly," Handley explained.



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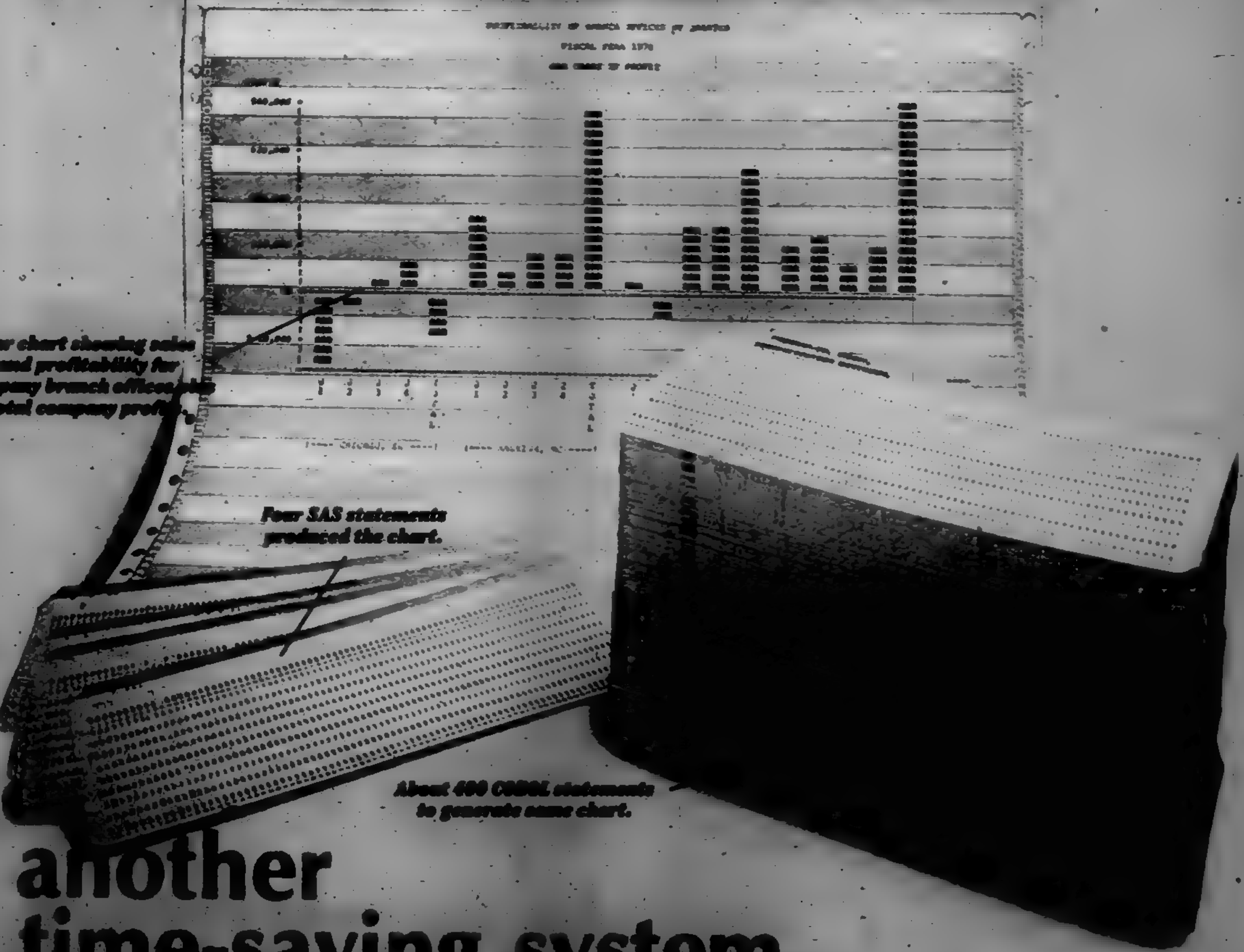
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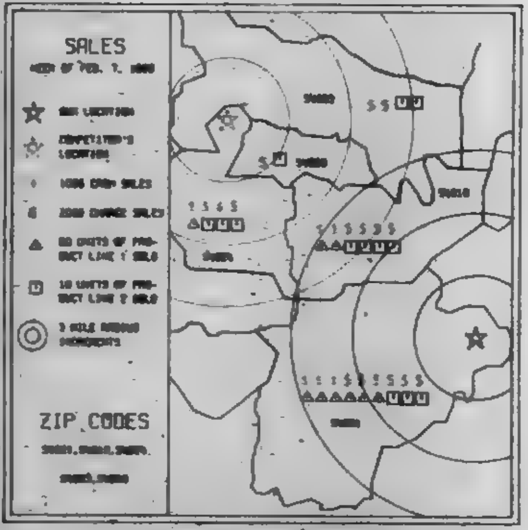

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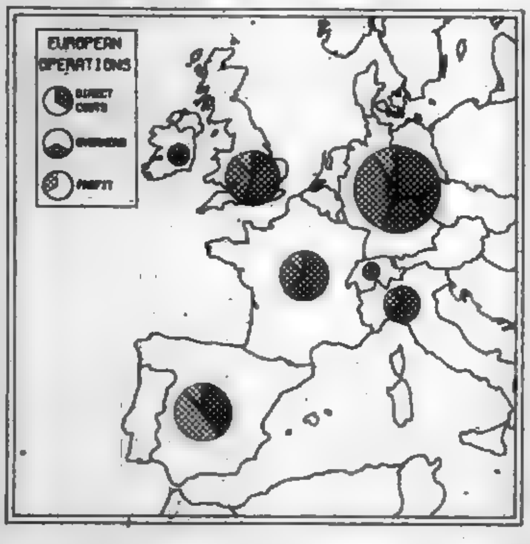

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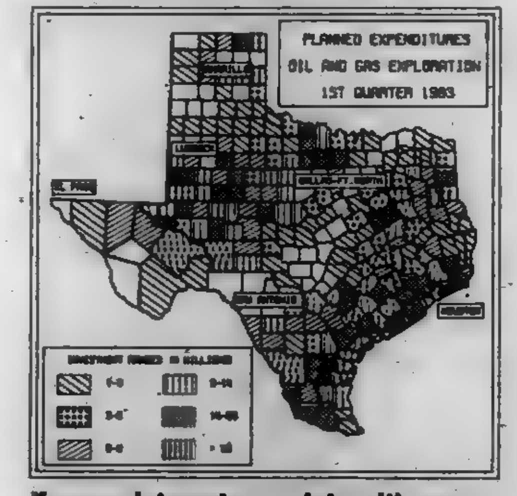

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Tracks $30 Million Worth of Parts

Engine Firm Saves With Distribution System

COLUMBUS, Ind. — Sometimes packaged software does not provide the best solution to an organization's DP problems.

For example, when Cummins Engine Co. here decided in 1978 to establish a bonded warehouse in Mechelen, Belgium, to handle its spare-parts distribution operations serving Europe, Africa and the Middle East, it was faced with a dilemma.

In order to operate such a warehouse efficiently within the European Economic Community (EEC), a highly sophisticated on-line computer system would be needed which could maintain accurate records of the arrival and shipment of 14,000 different types and sizes of parts to and from various nations both within and outside the EEC, thereby maximizing the duty reduction benefits stemming from bonded warehouse status.

Other requirements of the system included automatic currency conversion and the ability to invoice in five different currencies, a system for tracking import licenses and letters of credit, the ability to generate invoices in real-time and a general ledger system that could, among other things, report in both dollars and local currencies. A wide variety of other capabilities were also needed, related to basic distribution management functions such as inventory control, order fulfillment, sales analysis, planning and forecasting.

Extensive research had revealed that no such system existed, and the company had neither the resources nor the time to create such a system itself.

A specific company task force had spent two years establishing specifications for the system. That group then spent almost a year evaluating existing packaged distribution application software in both the U.S. and Europe without finding a system that even came close to what was needed.

In-House Study

Simultaneously, another group at Cummins had conducted an in-house study of the possibility of converting the batch system used to handle the company's domestic engine and parts distribution operations to an on-line, internationally oriented distribution management system.

According to Paul J. Linner, Cummins' manager of system development, "The numbers associated with converting our domestic system to international real-time operation, both in terms of man-hours and dollars, were staggering. In addition, due to other more pressing corporate projects, we did not have the available resources in-house to complete this task in time for the planned start-up date of our European distribution/warehouse center.

"We might have had to postpone or even cancel our plans if the data processing manager of one of our subsidiary companies hadn't recalled hearing about a 'turnkey' on-line-software/hardware distribution system developed by a Lexington, Mass., company, Distribution Management Systems, Inc. [DMS].

"Although DMS' software/hardware system didn't have all the international 'bells and whistles' we were looking for, it did have an on-line distribution management capability with many of the basic features we were seeking," he said.

Therefore, in late 1978 a contract was signed with DMS for two of its DMS-1000 software/hardware systems and the Digital Equipment Corp. PDP-11 minicomputer the systems run on. The first system was installed in three stages at the warehouse in Belgium beginning early in 1979. A second system was delivered to Cummins' Columbus headquarters for software support and system testing, Linner recalled.

At that point, Linner moved to Belgium for one year to coordinate the various software implementation phases, to establish procedures and to train the Belgian personnel that would be operating the system. Meanwhile, the DMS systems and software staff worked closely with Cummins' systems people in Columbus to create the additional application and system software that would give the basic DMS system the new functions required in the specialized EEC bonded warehouse environment.

As a result of the joint effort, Cummins' bonded warehouse/distribution center in Mechelen went into full operation early in 1980 and has been functioning successfully ever since, Linner added.

According to R. Kent Petersmeyer,

(Continued on SR/46)

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Firm Tracks Parts With Distribution System

(Continued from SR/45)

Cummins' director of international parts business, the benefits to the company of a computer-based bonded warehouse operation with the EEC have been "considerable."

As he explained, the 14,000 different parts and components stocked at Mechelen fall within 27 EEC tariff classes with duty rates ranging from 6% to 16%. Some 60% of these parts are produced by Cummins' plants in the UK, which is a member of the EEC.

Therefore, those parts can be shipped to the Belgian warehouse free of-duty, no matter where they are ultimately delivered. However, 40% of the parts stored there are produced in the U.S. These U.S.-made parts would normally be tariffed at the time of their entry into Belgium, regardless of their ultimate destination, Petersmeyer explained.

By operating a bonded warehouse and providing the Belgian customs authorities with detailed computer-prepared reports on the arrival and shipment of all parts that pass through the warehouse, Cummins is able to avoid paying duties on U.S.-made parts when they arrive in Belgium, as other U.S. and non-EEC companies must do.

The company therefore only pays duty on those U.S-made parts that are delivered within the EEC and only at the time those parts leave the warehouse. In addition, Cummins never has to pay duties on U.S.-made parts transshipped to Africa or the Near East.

"Considering that we moved some $30 million in parts through that warehouse last year and expect to increase that volume throughout the remainder of the century, it's not difficult to understand that operating the warehouse in a bonded manner contributes greatly to both the cash flow and profitability of our international parts-distribution operations," Petersmeyer observed.

"However, without our internationally oriented on-line distribution management system, we would never be able to track the flow of parts and produce the detailed reports necessary to achieving those financial benefits, nor would we have been able to achieve many of the other operational efficiencies that have contributed so much to the success of that Belgian warehouse/distribution center," he added.

Package Handles Firm's Contracts

(Continued from SR/41)

eral accounting, labor and cost system applications. The Prime also is used as a base for eight word processing stations.

"I helped evaluate 20 systems before Alberici decided on the Track 50 product," Novacek said. "It was exactly what we needed. Others were 'too canned' or 'not canned enough'; one did not allow any room for change, the other required too much work and DP skill to operate."

Alberici customized and assured flexibility by adding Info, a relational data base management system developed by Henco Software, Inc. of Waltham, Mass.

The integration of Info and Track 50, both running under Primos, Prime's multitask operating system, allows Alberici to tailor its presentation of information to individual requirements.

Alberici Vice-President Bill Pemberton, in charge of the company's Building Division, said, "This system really helps my project managers get a handle on current status and problems and, more importantly, on projected problems. The reports they look at now provide meaningful, concise, organized information that summarizes and provides an excellent picture of 'what is' and based on that 'what is,' what might be, whether good or bad. Now, managers can actually 'control' the successfulness of a project."

"Manual charts were often outdated before they were complete, and some systems' graphics were so complicated to use that they were untimely," Novacek explained. "With Track 50's graphics module and Info/Prime's power and ease of use, our charts are accurate, immediate and clear. Areas needing special attention are clearly identified; information is consolidated into small, easy-to-handle, reproducible charts."

Track 50 on Prime is designed for interactive batch operation. It will prompt users in three degrees of detail to accommodate different proficiency levels.

"There is actually some psychology to our report customization," Novacek said. "There are people who get a little nervous working with computer reports. The more manual and friendly the report, the more successful it is."

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When Choosing a System

Posing Questions Helps to Define Your Needs

By Curtis R. Beckman
Special to CW‡

Use a question-and-answer process to formulate your choice of application software and involve everyone concerned with the project in the decision. That is the approach the Housing Authority of Oakland, Calif., took recently when we purchased an application package.

The original question we asked was: Could we substantially improve the capability of our present DP system and save money in the process?

This question led to more specific requirements: greater response from the system in accomplishing hour-by-hour work, more up-to-date information on authority functions, accessibility of information by all departments, speedy retrieval and reduction of direct data processing expenditures.

Implementation Steps

The next phase was to develop implementation steps. These included system requirements and operating characteristics, plus a request for proposal (RFP) for an evaluation methodology.

Responsibilities were delegated to the DP department under the supervision of the authority's DP Steering Committee. The authority's Board of Commissioners approved the plan conceptually before the development and reviewed and approved each phase after completion. A consulting certified public accountant firm assisted in evaluation, and the city attorney's office performed legal reviews.

The data processing staff proceeded by drafting present and future system scenarios for each major operating unit of the authority. The present scenario served as a description of the point of departure and as a measure of progress. The future scenario described new methods of operating in accordance with the overall objectives — but without any cost or technological constraints.

Next came discussions of the plan with responsible managers. Suggested refinements were incorporated and the system's relationship defined. Finally, the consolidated drafts with the summary of current data processing costs were presented to the authority's DP Steering Committee for consideration.

Three Decisions

Three decisions resulted from the review. The first was to make the transition process the basis for the RFP. The key was to request proposals based on how to make the transition rather than for specific equipment.

The second decision was that a maximum constraint on spending was also needed. We agreed that five years was a reasonable system life cycle and that we should constrain spending to the same amount as the projected spending assumed for the present system.

The last decision was to recommend that the Board of Commissioners approve further development of the project. Following the board's approval, the authority began incorporating the system scenario in an RFP and developing the evaluation methodology. The committee used the information already collected on the existing system and added bid instructions to write the RFP document.

Assign Weights to Criteria

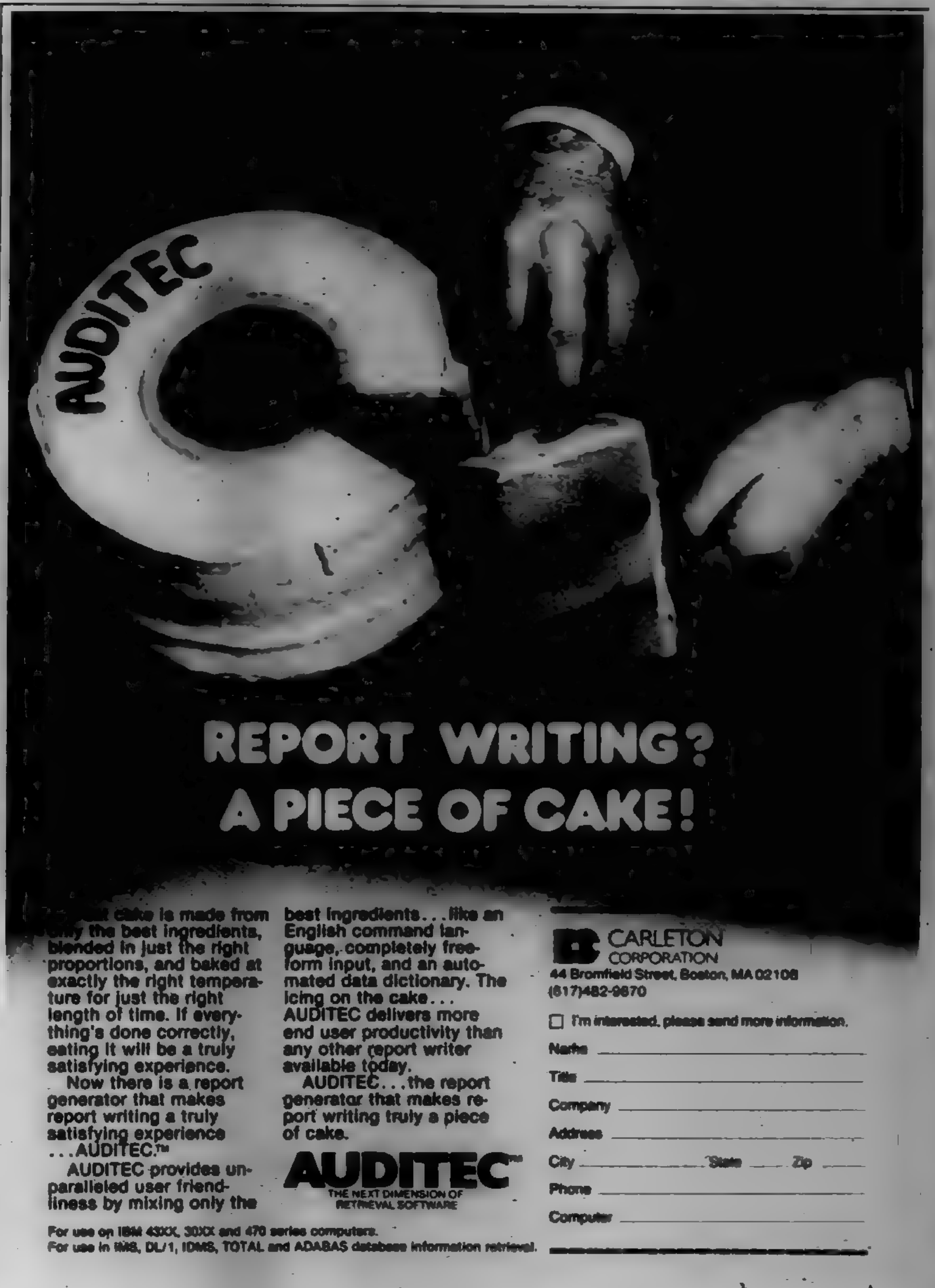
It's important to evaluate the proposal objectively. We assigned weights to the criteria according to our needs. Our needs were primary applications, 20; conversion, 5; management and training, 5; other applications and support, 5; costs, 25; maintenance, 10; and contractual relations, 10. The remaining 20 points were for hardware.

Using this list, the DP staff and our management consultants identified subcategories to be used in evaluating vendors' responsiveness. Related questions were developed and subtotals of weights were allocated to each category.

Related questions involved potential expansion possibilities, vendor training and support, maintenance agreements, references, financial standing and qualifications of systems designers, analysts and programmers. It is vitally important to investigate thoroughly the potential vendor.

Next, we devised a proposal evaluation work sheet that provided space for entry of answers obtained from each submitted proposal. This list was included in the RFP for the benefit of the vendor.

(Continued on SR/48)



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Insurance Firm's Investment in System Pays Off

LONG GROVE, Ill. — Sometimes a company has to spend money to save money.

By making the investment in Policy Management Systems Corp.'s Policy Management System (PMS) package to automate commercial automobile and workers' compensation, the Kemper Group, headquartered here, feels it will save at least $2 million gross in operating expenses the first year. But even with 33 branch and eight division offices handling commercial auto and workers' compensation, Kemper is just beginning a long-range plan. When PMS Version VII is implemented, automating commercial property lines, Kemper estimates that savings will triple to $6 million per year.

For the 13th largest property and casualty insurance company in the U.S., writing $800 million in annual commercial lines premium, commercial automation was a massive effort. But Kemper's installation was completed in 16 months.

Honest Approach

"We took an honest approach in introducing PMS," Dale Johnston, manager of Kemper's PMS installation, said. "If we had tried to sell automation as 'pushing a button and watching the system do the work,' we would have been asking for attitude problems. Instead, we took a low-key approach and plainly told our users that Kemper needs automation to stay competitive over the long-run."

Al Clement, division operations officer at Kemper's New England Division, added, "We spent a good deal of time telling our division users what PMS was, and more important, what PMS was not."

The surprise was that the Kemper people were not only ready for automation, but were excited about it as well. In Johnston's view, the change in attitude over the years is remarkable. "Kemper has had automation in some form since the '50s. When we implemented our earliest systems, we had predictable staff turnovers in some offices. People did not give automation a chance. But today, users are surpassing our expectations in accepting the challenge to make automation successful."

Although accepting automation seemed inherent in Kemper's field force, management nurtured the attitude with deliberate care. For pride of authorship, Kemper named its PMS production system Polaris, which stands for Policy Automated Rating and Issuance System. Users think of it as Kemper's system with programs provided by Policy Management Systems. But beyond encouraging the attitude, Kemper thoroughly trained employees to use PMS.

A six-member team at the Kemper home office was responsible for creating the training materials for the installation offices. After attending classes sponsored by Policy Management Systems, the team worked full-time for over a year to develop and implement Kemper's training materials. Two videotaped presentations to introduce the system, an intensive two-week training course and a comprehensive operator's guide were among the training materials.

(Continued on SR/50)

Posing Questions Defines Needs

(Continued from SR/47)

As time progressed, we needed to divide further the phases, such as initial screening of proposals, selecting two proposal finalists and further evaluation of the finalists. After the initial screening, the committee reviewed each proposal, answered the questions and compiled the answers on the proposal evaluation work sheet.

The final stages involved scoring each subcategory individually by members of the DP staff, averaging the scores and multiplying by the weight assigned to each subcategory. The sum of all the extended scores ranked the proposals in order of responsiveness to the qualitative requirements of the authority.

For the last step, we evaluated cost by developing five-year cost projections and comparing them with the projected five-year costs, assuming the status quo. The two highest scoring proposals became the finalists.

The two finalists made a one-day capabilities presentation/demonstration and answered specific issue questions. These finalists were then rescored using the same methodology, and the new average pointed to the most responsive finalist. If quality had not matched costs, we would have computed cost per qualitative point, with the lowest cost per point being the highest rated proposal.

Beckman is manager of data processing at the Housing Authority of Oakland, Calif.

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Handles Membership Services

Educators Group Chalks Up Growth to System

BURLINGAME, Calif. — A software package designed specifically for nonprofit institutions is enabling 14,000 California educators to make their voices heard in an effective and organized fashion.

The Association of California School Administrators (Acsa) is a group of educators who have joined together to support mutual career goals and interests. Special projects organized from Acsa's Burlingame headquarters here include a continuing education program, a publication-distribution clearinghouse and political activities to encourage high standards for the more than four million California students.

Formed in the late 1970s, Acsa has grown rapidly. It now comprises 18 regional districts with many local chapters in each region. Originally, a computer service bureau handled Acsa's membership mailing and administration. But the service bureau's batch-oriented environment required extensive paperwork and limited Acsa's membership service flexibility.

Accounting Problems

Preparing mailing lists and tracking membership dues were only a few of Acsa's membership accounting problems. According to Robert E. Lowe, Acsa director of management information services, "Delays of up to a full week for simple mailing lists were not uncommon. Greater limitations of our accounting system restricted our ability to provide other services requested by our members."

To cope with the delays, Acsa recently purchased a Wang Laboratories, Inc. VS80 system and the Software for Nonprofit Association Processing (Snap) system developed by Data Direction of Oakland, Calif.

Nonprofit organizations obtain operating expenses by collecting fees for products and services. But unique accounting problems are created by multiple membership rates, optional benefits and different payment schedules.

For example, six different Acsa membership fee structures exist for a variety of categories. Each membership category receives different publications and privileges and may pay for the optional services by different methods. Snap is an "open item" accounts receivable, accounts payable and general ledger system that allows Acsa members to select from a mix of billing methods.

"A school administrator can pay his membership fee via payroll deduction and pay cash for his family life or group life insurance," Lowe explained. "Our members really enjoy this unique convenience."

Other services include insurance options, a credit union, legal assistance and discounts for popular products and activities, Lowe said. Snap can track as many as 10 separate billing items.

Data base capabilities included with Snap allow up to 30 unique characteristics for each Acsa member to be logged and identified, a spokesman said. Acsa tracks member backgrounds, size and types of schools, job classifications, years on staff, publications received, professional seminars attended and other interests, such as a talent for political lobbying. These characteristics can be analyzed as part of a geographic, regional, district or chapter profile.

"We can prepare almost any selective search of our membership data base that we want," Lowe said.

Acsa also uses Snap to coordinate distribution of its weekly newspaper *EdCal*, monthly magazine *Thrust*, a catalog of resource information and other special bulletins. "Address changes used to take one month with the service bureau," Lowe said. "With Snap, morning address changes are applied to the afternoon mail."

Consolidating Monthly Reports

Monthly reports have also been consolidated, Lowe said. Careful analysis of membership needs reduced the number of regularly generated reports from more than 50 to five. "Snap lets us make special reports on an 'as needed' basis instead of by default," Lowe said.

Acsa also uses the Snap Conference Subsystem to maintain accurate registration and reservations for conferences and workshops. For a typical event, Acsa may have 400 members attending 10 different workshops with a capacity of 40 per class, Lowe said. Snap ensures that all classes are filled equitably on a first-come, first-served basis. Lowe said the association also recognizes

(Continued on SR/50)

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Educators Chalk Up Improvements to System

(Continued from SR/49)

significant cost savings from having precise hotel and restaurant reservations. "It gets expensive to have the caterer prepare 50 dinners at $7.50 apiece and then have only 30 show," he said.

Using Snap's planning and post-event tracking capability, Acsa has recently implemented an in-house mini university in which members earn college credit for administrative classes.

Participating members reach simple milestones as they progress through the training program, and Acsa follows up on class attendance with on-site visits to school districts.

Acsa also takes positions on issues affecting public education. In last November's state elections, the organization supported a proposed $500 million bond issue to provide capital outlay for construction or improvement of public schools and opposed a proposed constitutional amendment that created a textbook loan program for private school students. By informing and motivating its 14,000-plus membership, Acsa takes some credit for successfully prevailing on both issues.

According to Lowe, successful campaigns on these two issues alone has justified the entire cost of Snap.

Wangnet communications software now connects Acsa's Sacramento, Calif., lobbying staff with the Burlingame headquarters. Immediate news on legislative actions is transferred over this link for use in weekly publications.

Firm's Investment in System Pays Off

(Continued from SR/48)

In groups of 12, two or three people from every branch office took the course to learn how to use PMS. A PMS test system was rigged so that the master file would present policies for renewal, audit transactions and other activities during the course of the class. In two weeks, the users learned to operate PMS with respect to new business, renewals, changes, audit transactions, inquiry transactions — every business transaction that is likely to occur in day-to-day operations.

Kemper's system is very close to the PMS base system. The modifications and interfaces with Kemper-produced systems were kept to a minimum. But even so, before crossing the nation to implement the system, Kemper had to secure program code for each branch office. For nine months the system was tested for every state behind the scenes. As each division office was installed, testing was concentrated for the office's primary states.

The first Kemper office to install PMS was the Summit, N.J., branch in the Mid-Atlantic Division. Lou Vozza, division operations officer, wanted to be first for two reasons: "We needed to cut expenses and we saw PMS as the way to do it. I see automation as the way of the future and I just wanted to get into it early."

After Kemper's home office assisted with the first installation, the divisions implemented their other offices.

Value to Underwriting

Paul Clark, Empire Division operations officer, and Nick Tkachuk, Central Division operations officer, commented on the system's value to underwriting. "Before we implemented, I was worried about underwriters adjusting to the system," Clark said. "I started with an extreme and told underwriters not to pull any files. They've learned to rely on PMS and only pull files when it is absolutely necessary."

Tkachuk continued: "The on-line quote capability has been a tremendous help in underwriting. The casualty underwriters are using the system with such success that the property underwriters are anxious to get a taste of PMS with Version VII."

Johnston commented that the training was costly and the implementation plan meticulous, but as a result, each office began processing on a new and renewal basis on the first day it had the system installed.

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Problems That Confound Personnel Data Bases

By Richard W. Iverson
Special to CW‡

Applications packages that create an information data base with many users can deteriorate in the eyes of the users without the management information systems (MIS) staff knowing about it. The data base that most easily annoys its users is, probably, the human resource data base — a mixture of personnel, payroll and benefits information. The functions can change quickly, and the users tend to vary in sophistication.

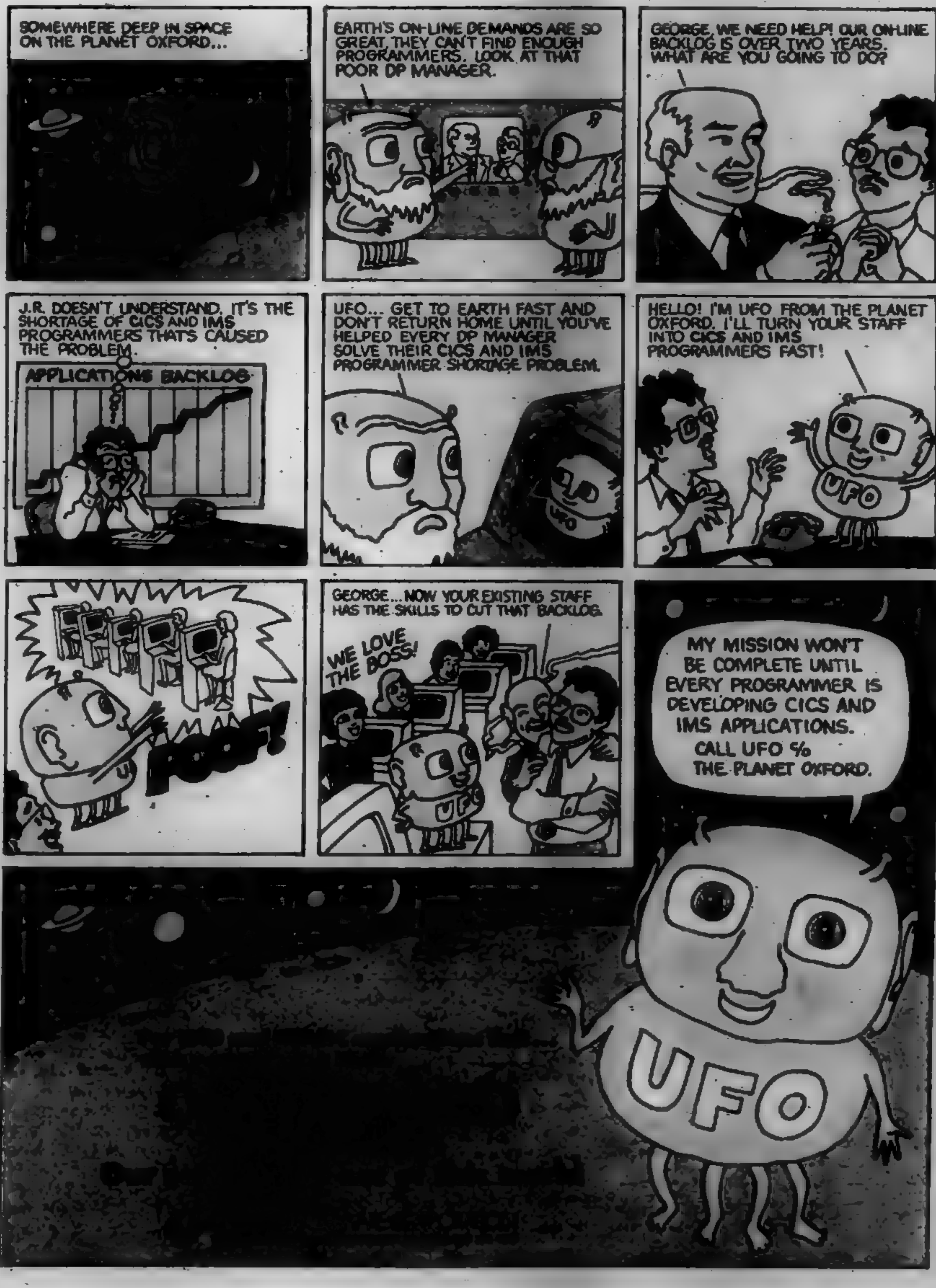
We can assume that there is a group responsible for human resource systems, a human resource information center, which usually is located in personnel. Along with each standard is a description both of symptoms that indicate a problem is present and of specific audit steps that can be taken to examine the problem.

There are two types of error: data that was wrong when it was entered and data that became wrong because it was not updated.

Though most systems have edit criteria to screen incoming data, errors do slip past the edit routines because wrong data can be legitimate. These errors can be caught by tightening the feedback loop. If the person who submitted the data could see what it looks like after being processed by the computer, most mistakes could be detected quickly. The principal means for doing this is a turnaround document such as an employee profile.

The error that results from out-of-date information can best be treated

(Continued on SR/52)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Keep Careful Watch Over Personnel Data Bases

(Continued from SR/51)

by examining where the delay occurs. Sometimes the manager neglects to send in a profile or other change document. This can be corrected by training, communications, documentation or a procedural change that ties the submission of profiles to what the manager wants, such as a salary increase for the employee.

The scope of information in the data base needs to be reviewed at least annually: Do the people who use the system have the information they need to do their jobs? If not, how feasible is it for the system to supply the necessary data?

Symptoms of a problem with data base accuracy and completeness include:

- Incorrect data on reports.
- Mismatched information when personnel data is compared with other data.
- People continuing to maintain old records.

Audit steps you can use are:

- Review audit trails for number of errors and determine how quickly the errors are corrected.
- Run searches for missing data.
- Determine feedback process. Does it cover all of the data? Is it regularly applied?
- Interview the functional managers in personnel to see how they want to use the system and why they may not be using it that way anymore.
- Interview senior management to determine how their needs can be better met.

Before the advent of human resource systems, periodic reports were part of the routine drudgery of the personnel department. Personnel staff kept its fingers crossed that head-count figures would not be too different from those produced by payroll or other departments.

Symptoms of a problem with standard reports include:

- No one complains if the reports are missed one week.
- Complaints from senior management that they did not know what was going on despite having been told about it on a report.
- Piles of paper in the center for human resource information.

Audit steps you can use are:

- Review a list of all standard reports, their control frequency and distribution. Do people know why they are used?
- Determine whether a newly hired person receiving periodic reports gets an explanation of them.

The ability to extract information easily from the human resource data base may not be widely known within an organization. Evidence of this is the uneven distribution of report requests. Most organizations do not use data effectively.

Symptoms of a problem with ad hoc reporting include:

- Only people in the data processing department write reports because the report writer is so complicated.
- Not many reports are requested each month.

Audit steps you can use are:

- Review the number of ad hoc requests run each month and determine the source. Are they mostly from within human resource? Do other parts of the organization request reports?
- Determine the nature of the requests. Are there business problems in the organization that could be better handled with information from the data base?

Personnel staff have different degrees of involvement with the system. Those directly responsible must have some understanding of how the system works technically. These people should be able to make the revisions needed to meet "impossible" requests.

Symptoms of a problem with staff knowledge include:

- Complaints about lack of service from the human resource information center.
- Documentation on system was supplied by the vendor, but never modified.

Audit steps you can use are:

- Determine whether the human resource information center staff knows how to interpret reports produced by the system.
- Ask whether searches are logged. Are costs of operating the system known? Are error rates satisfactory? Is there any formal training for a new person?

There are two kinds of policies involved with a system. One set governs the operation of the system itself and the other is made up of normal personnel policies that are implemented with the aid of the system.

Whether a system is administered effectively is partly a function of the clarity of the policies, procedures and documentation. But in many organizations, the question is one of

(Continued on SR/54)

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Software Fits System/38

Finance Package Shoulders Firm's Accounts

BERKELEY, Calif. — Finding the right software package becomes even more of a challenge when there are few offerings for your particular hardware configuration.

Jeff Kohr, controller at The North Face here, found that although the IBM System/38 has been available since 1980, very few comprehensive software systems had been developed to meet the unique design concepts of this system. The North Face, which manufactures and markets outdoor equipment such as tents, backpacks and clothing, leased a System/38 in March of 1981.

"Most of the four or five software packages we found either did not take full advantage of the System/38's data base capabilities, had been converted from other systems or were not written in RPG-III. We chose Lawson Associates, Inc.'s General Accounting software because all of the programs met our accounting needs and were developed for the System/38," Kohr said. Lawson Associates is a Minneapolis-based software company.

"We looked at many companies that were trying to sell software that was not finished. If you have an immediate installation deadline and the software is not completed, it can throw off your entire schedule," Kohr said. "Ken Holec, from Lawson, was able to demonstrate its software, and we had a chance to see how it worked."

Kohr feels that Lawson's accounting software embodies the company's philosophy — providing good, basic, easy-to-modify software that does not contain a lot of extras that most companies do not need and probably never will. "It is good, user-oriented, well-documented software that works," he added. Initially, Kohr was concerned that distance would pose a problem during the installation and implementation of the software.

Kohr is pleased with the support from Lawson. "Most problems are handled over the phone," he explained, "and on-site installation and training are included in the package price. We have had someone from Lawson here twice since we installed the software to install modifications and iron out some problems. Distance has been no problem at all," he maintained.

"No packaged software is perfect," Kohr explained, "and I would be wary of any vendor that said its software was completely 'debugged.' The System/38 is still relatively new, and its capabilities are just being explored. Minor bugs are a fact of life, but a good vendor should be able to correct bugs quickly and efficiently. Lawson has been very accessible in terms of correcting any problems that have developed. That accessibility helped tremendously in the system implementation."

Kohr felt the most effective way for The North Face to use the System/38 was to install packaged software for the accounting functions. Purchasing packaged software would allow the company's in-house DP staff to concentrate on developing and refining the company's manufacturing and distribution systems.

"With North Face's internal resources and Lawson's capabilities, we felt that it was best to purchase packaged accounting software so that our staff was not working simultaneously on two independent systems. We didn't feel that either system could be delayed," Kohr said.

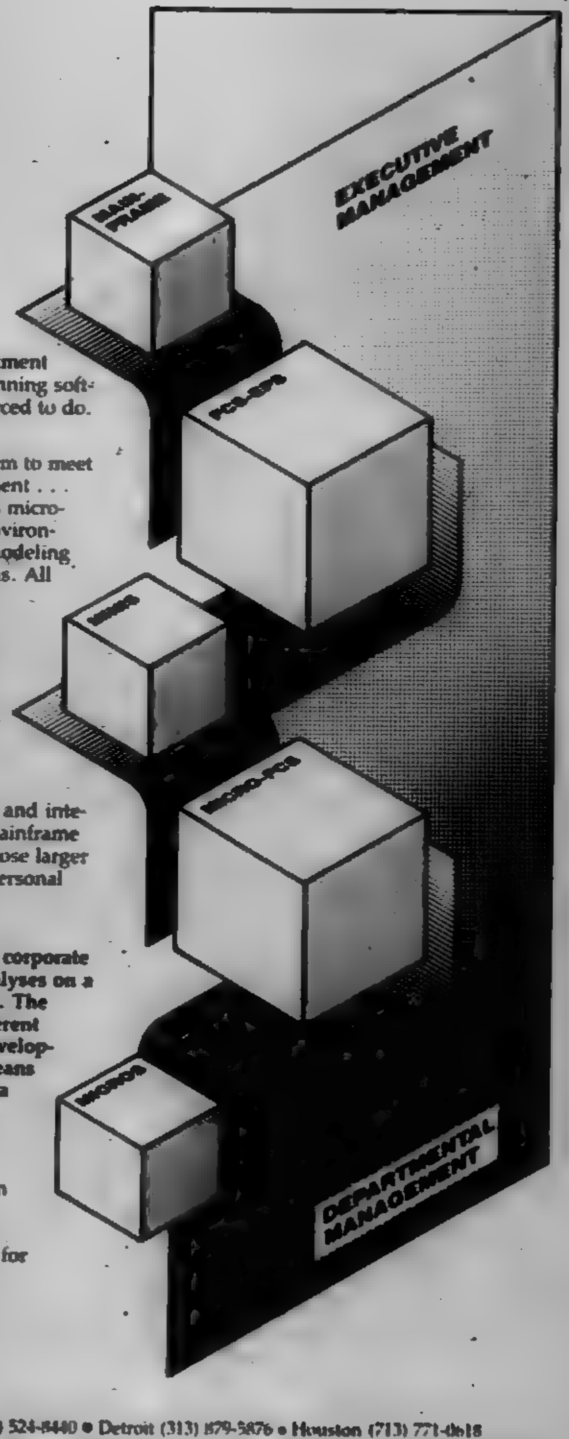
In early February of 1982, The North Face began working with Lawson. By the end of the month, Lawson had installed complete Accounts Payable and General Ledger systems. Lawson's Fixed Assets system is being installed and its Payroll system was installed last June.

"Everything went smoothly during the installation process. In fact, we asked Lawson to convert our General Ledger and Accounts Payable master files prior to installation," Kohr said. "With our limited internal resources, we felt that it was the best use of both our time and the software to have the company that developed the programs convert the data that would ultimately be used in the system."

One of North Face's most important needs was immediate delivery. In January of 1982, North Face experienced a common, potentially disastrous problem with its computer — the disk drive failed and some data was lost.

"We were more than two months behind in our accounts payable and needed to get caught up quickly. With Lawson's help, we closed five months of accounting periods in 2½

(Continued on SR/55)



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Personnel Data Bases Need Careful Planning

(Continued from SR/52)

their presence or absence rather than their clarity.

Symptoms of a problem with policies, procedures and documentation include:

- Everything falls apart when the system developer leaves.
- Inconsistent application of policies because the procedures are not spelled out or are not changed when new circumstances arise.

Audit steps you can use are:

- Ask someone in the human resource information center a question that requires reading the documentation.
- Determine when the documentation was last updated and who is responsible for changing it.

Forms and reports are still integral parts of the flow of necessary information. The customary means for providing data about an individual is the profile — a preprinted form that displays relevant information and is used as a turnaround document.

How smoothly the updating process works depends on the manager's desire to complete the form, his understanding of how to complete it and the difficulty of entering approvals for the form's data into the system.

Symptoms of a problem with paper flow and consolidation of forms include:

- Complaints about out-of-date information.
- Reports are late, illegible, voluminous and unread.
- The forms are too difficult to enter into the system directly.

Audit steps you can use are:

- Collect copies of all forms used with the system. Are forms that receive wide distribution well designed and easy to read? How many forms could be eliminated with modification to a profile, procedure or report?
- Trace the flow of key forms. Are forms handled in a timely fashion? Do delays degrade the information in the data base?

Efficiency is the total amount of machine resource and people resources, including the time of the users required to produce the desired result.

When modern on-line data base systems run into problems of excessive waiting, the on-line input and/or the on-line data retrieval can be unhooked from the data base. The input may still be entered on-line, but would be held for batch update. Retrieval could also be on-line, only against an extract of the data base rather than the data base itself.

Working with day-old data is not a problem for most personnel and payroll departments. Some software packages make this "unhooking" easy, while others require extensive programming.

Symptoms of a problem in technical operations include:

- Chargebacks are eating up more of the budget.
- Users are frustrated over slow response time.

Audit steps you can use are:

- Review costs of operating the system.
- Compare the trend of costs of systems with volumes of input, retrieval and other transactions.
- Analyze size of master files and table files and determine what, if anything, can be purged. Can systems be made more efficient by handling parts in a batch mode?

Most of the flack around a human resource system results from friction between the human resource information center and any of three groups with which it interacts: data processing, personnel and line units.

The human resource information center and the data processing department lean on each other. The human resource information center is dependent on DP for technical understanding and operational support. DP is dependent on the information center, as it is on users in general, to justify its existence.

Symptoms of organizational problems include these remarks:

- "They make everything a hassle."
- "Basically, they're arrogant."
- "They take forever to do anything."

Audit steps you can use are:

- Ask if anyone involved with the system has said this and about whom.
- Interview the system's key users to determine how helpful and knowledgeable the human resource information center staff is. Ask human resource center staff what its users are like.

In summary, only periodic audits that apply generally accepted standards can assure that a data base continues to provide maximum benefits to the organization.

Iverson is president of Iverson Group, Inc., a New York-based human resource system consulting firm. He was cofounder of Insci, which specializes in human resource applications.

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Food Firm Find Handles Shipping Rates

ENGLEWOOD CLIFFS, N.J. — The reorganization of its transportation system by product orientation led to the need for two rate-handling software packages for CPC International, Inc. here.

CPC International is a corporation with 31 manufacturing plants in North America that handle its two major business segments: branded grocery products and corn wet milling.

The transportation department has been actively involved in the establishment of computerized systems to reduce and control the transportation costs since the early '60s, John J. Clement, the firm's director of transportation explained.

In 1964, a Transportation Information Program system was implemented to control the utilization of a fleet of more than 4,000 railroad cars through a trip forecast time, along with a semiautomated routing program that included mileage allowance accounting.

Since the enactment of the Motor Carrier Act of 1980 and the Staggers Rail Act of 1980, freight rates have lost much of their predictability and stability from the standpoint of anticipated lead time before change. This has created a sense of immediacy for shippers and a need to catalog, look up and update rates on a very short notice, plus the ability to immediately communicate the changes to users.

"We realized quite early that the new re-regulated transportation world was going to mean a new transportation organizational approach. We would have to structure for greater flexibility for price negotiation," he said.

"We have to be able to react immediately to take advantage of potential cost-savings opportunities.

"There is no doubt that reorganizing our transportation department by product orientation is the most effective way for CPC to now deal with its carriers and to obtain the least costly transportation prices," Clement said.

In 1971, CPC installed a semiautomated rail tariff rate-maintenance system (only for corn products) with the cooperation of an outside-rate maintenance firm. "Under the regulated rate environment in the 1970s, this inside/outside cooperative service approach worked very well. Today, with deregulation creating an atmosphere whereby negotiation of rates is between the shipper and the specific individual carrier, we must arrive at and distribute current rate information within hours, not days or weeks," he said.

By 1980, corn products was online with a newly developed internal Business Administration Order-Entry System using on-line CRT terminals tied into a major Honeywell, Inc. Executive central processor.

Next the firm looked toward automatically integrating a computerized rail and motor-rate data base into this new on-line system.

In October of 1981, CPC contracted with Transportation Concepts and Services of Metuchen, N.J., to install its Compu-Rate II and Compu-Rate IV software packages and began on-site implementation and training.

Compu-Rate II creates, maintains and distributes large volumes of rate data; Compu-Rate IV, when provided with CPC's internally generated shipment data, retrieves applicable rates from the rate files of Compu-Rate II and calculates the lowest applicable freight charges for application to bills of lading and/or sales invoice records, he said.

Package Found For System/38

(Continued from SR/53)

months using multiple entries," he said.

"All the systems were completely documented and ready for installation. Cost justification was no problem. We have been able to handle a larger volume more quickly without adding to our staff in any way. The software has good audit trails, which should make our audit firm happy," Kohr said.

The North Face has one of the largest System/38 installations on the West Coast and the system is used almost 24 hours-a-day, Kohr said.

Because of its extensive use of the system, Kohr feels that North Face has pushed the system to its limits and has been generally satisfied with the results.

"The System/38 is basically a good, sound machine. I like the concept and the way it operates. We may have had more problems than most companies because we use the system so much. I think IBM solved a lot of problems when it brought out Release 3, and we are looking forward to upgrading to the Model 7," he said.

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For Scientific Programs

SEL Introduces Line of 32-Bit Minis

By Ed Scannell
CW Staff

FORT LAUDERDALE, Fla. — Gould, Inc.'s SEL Computer Systems Division took the wraps off a series of middle-range 32-bit minicomputers that, according to Whetstone benchmarks, run scientific programs an average of 50% faster than similarly configured Digital Equipment Corp. VAX 11/780 and 11/782 systems.

Software-compatible with the company's low-end 32/27 line and high-end 32/87 series, the 32/67 family consists of the 32/6705 and 32/6750, which both process 1.7 million Whetstone 1 instruction/sec, and the 32/6780 that performs 3 million Whetstone 1 instruction/sec. This compares with the 11/780 and 11/782 Whetstone ratings of 1.2 and 2.0, respectively.

The three systems, which run under SEL's recently released version of the Unix operating system, cost between $120,500 and $170,000, depending on the configuration chosen. All three systems will be available in June, the company said.

Besides the three 32-bit systems, SEL also announced it is forming a new marketing group called Distributed Systems. The group will sell products primarily to the engineering and scientific markets that will complement the company's existing product lines. The first products will be brought to market before the end of this year, a spokesman for the company said.

Unlike most producers of minicomputer systems, SEL attributes the processing speed of its new systems to hardware, not software. While enhancements made to Unix and SEL-developed MPX operating systems contributed to the three systems' Whetstone ratings, the company claimed that innovative hardware is largely responsible for those scores.

One of the hardware components the vendor said is an industry first is the 32K-byte dual cache memory that has separate 16K-byte banks for data and instructions. Dave Lowry, product manager of the 32/67 family, said it is this type of cache orga-

(Continued on Page 56)

The Gould 32/67

HP 3000 Users Get Disk Drive

WESTLAKE VILLAGE, Calif. — A disk drive system offering increased storage and performance as well as proprietary cache options for Hewlett-Packard Co.'s Series 3000 Models 30, 33, 40, 44, 60 and 64 computers has been introduced here by Qualex Technology, Inc.

The Series 4000 is available with either 410 or 820M bytes of formatted data on a 10½-in. Winchester-type fixed disk drive, the vendor explained. It is packaged in a single cabinet that can house two drives. Qualex's cache options include a choice of four internal storage configurations, providing hit-rates of 80% to 90% on most frequently accessed data, the vendor claimed.

Pricing on this series starts at $25,000 for the initial 410M-byte configuration, with add-on drives priced from $22,650. Further details may be obtained from Qualex at Suite 110, 31220 LaBaya Drive, Westlake Village, Calif. 91362.

Why Introduce 8-Bit Business Systems?

Analysis

In the past few weeks, two major microcomputer manufacturers — Tandy Corp. and Altos Computer Systems, Inc. — have released systems that appear to violate what is fast becoming the business systems rule: They are based on 8-bit, rather than 16-bit microprocessors. However, there is a method to their architectural madness.

While both firms are marking time until there is ample software for their 16-bit systems, they hope to use the new 8-bit entries to cash in on the increasing number of entry-level applications in the business marketplace.

"There is a lot of 8-bit software avail-

(Continued on Page 58)

Micro Incorporates Intel Coprocessors

PALO ALTO, Calif. — Information Solutions, Inc. has announced the Model 430 IPS, a microcomputer that incorporates Intel Corp. 8086, 8088 and 8089 coprocessors.

The unit is available with 128K bytes of random-access memory (RAM), which is expandable to 512K bytes. The system also features a detached keyboard with an IBM Selectric layout, cursor control, 10-key speed pad and up to six RS-232C serial channels for local terminals, printers and modems, the vendor said.

The unit supports up to four 5¼-in. Winchester disk drives and two double-sided dual-density floppy disk drives, the vendor said.

A basic Model 430 IPS uses Digital Research, Inc.'s MP/M operating system and costs $10,000 and up, the vendor said from 2205B Fortune Drive, San Jose, Calif. 95131.

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PC WORLD Day March 19 Program of Events:

Located in the Ballroom of the San Franciscan Hotel, one block from Brooks Hall, San Francisco.

9:30–10:30 a.m.
"Systems Software for the PC"
Panel members: Gary Kildall, President, Digital Research; Chris Larson, Director of Marketing, Microsoft; David Hughes, Independent Consultant; Syd Geraghty, President, Quantum Software; C.A. Irvine, Vice President of Engineering, SofTech Systems; Kearney Rietmann, Associate Editor, *PC World*.

11:00–12:00 p.m.
"The PC Phenomenon"
Panel members: David Bunnell, President and Publisher, *PC World*; Cheryl Woodard, Associate Publisher, *PC World*; Ron Posner, Chairman, National Training Systems; Portia Isaacson, President, Future Computing; Martin Alpert, President, Tecmar.

12:30–2:00 p.m.
"Second Generation Software"
Panel members: Mitchell Kapor, President, Lotus Development Corp.; Jeff Harbers, Associate Manager, End-User Division, Microsoft; Gilbert Hoxie, President, Context Management Corp.; Roy Folk, Division Marketing Manager, VisiCorp; Harry Miller, Associate Editor, *PC World*.

2:30–4:00 p.m.
"PC Multiprocessing, Networking, and Communications"
Panel members: Drew Major, Software Systems Manager, Novell Data Systems; Steve Pomeroy, Product Marketing Manager, 3COM; Steven Cook, Technical Editor, *PC World*; Phil Belanger, Omni Project Manager, Corvus.

4:30–6:00 p.m.
"PC Add-Ons—What Is Compatibility?"
Panel members: Rod Canion, President, COMPAQ Computer Corp.; Andrew Fluegelman, Editor, *PC World*; Dr. Robert Harp, Chairman of the Board, Corona Data Systems; Karl Koessel, Programming Editor, *PC World*; Steven Cook, Technical Editor, *PC World*; Martin Alpert, President, Tecmar.

The West Coast Computer Faire Is March 18, 19, 20

For pre-registration at a discount for 10 or more call Computer Faire (415) 851-7077. Registration at the door for 3 days including conference program and show is $15.

Don't Miss PC WORLD Day March 19

Attendance at PC WORLD Day events is free to all participants in the West Coast Computer Faire, but space is limited to the first 500 persons so please come early to ensure you don't miss PC WORLD's presentations.

Also, visit the PC WORLD booth at Brooks Hall. Booth numbers: 1127, 1129, 1131.

3M Adds Rigid Disk Module to Micrapoint II

ST. PAUL, Minn. — 3M Corp.'s File Management Division has added a rigid disk module to its Micrapoint II computer-assisted micrographic retrieval (CAR) system to expand capacity and improve throughput for users. The module is geared toward users with a volume of 10,000 entries per week.

The module contains a 70M-byte (unformatted) disk said to provide users with a net capacity of 40M bytes for record storage. Incorporated in the same floor cabinet is a streaming-tape, ¼-in. data cartridge system for backup.

Other features include a "delete and pack" operation to remove portions of entries to free up space, an archive-to-diskette operation to hold data removed from the rigid disk system and the addition of up to five remote terminals and a display printer.

The Micrapoint II with disk module and Essential Model 6000 reader printer cost $60,000. Software for the system and a program allowing current users to move existing diskette records to the rigid disk are included in the price, the vendor said from 3M, Department FM-83-7, P.O. Box 33600, St. Paul, Minn. 55133.

3M Corp.'s Rigid Disk Module

Interfaces Allow Controllers To Drive Plotter/Printers

ANAHEIM, Calif. — California Computer Products, Inc. has announced three interfaces that allow the firm's plotter controllers to drive electrostatic plotter/printers (EPP) manufactured by Versatec, Inc.

The Versatec EPP interface (Veppi) allows Calcomp Model 951 and 953 vector-to-raster controllers to drive any Versatec 8000 series or V80 plotter/printer as well as one Calcomp plotter, the vendor said.

The Versatec Translator Interface (VTX) enables up to eight Versatec or Calcomp plotter/printers (in any combination) as well as one pen plotter, to be driven by Calcomp 951 or 953 controllers, the vendor said.

The Versatec Plotter Control Logic (VPCL) interface allows a Calcomp 5000 series printer/plotter to look like a Versatec 8000 series or V80 series printer/plotter, the vendor said.

The interfaces cost between $2,000 and $4,000, the vendor said from 2411 W. La Palma Ave., Anaheim, Calif. 92801.

Winnies Aimed At Micro Mart

SANTA CLARA, Calif. — Memorex Corp. has announced two compact 5¼-in. fixed/removable media Winchester disk drives.

Called the 400 series, the drives are available in two models: the 410 with 5M bytes of fixed and 5M bytes of removable storage; and the 415, which offers 10M bytes of fixed and 5M bytes of removable storage, the vendor said.

Aimed at the desktop computer market, the drives are designed to provide an 8,000-hour mean time between failure and no routine maintenance is required, according to the vendor.

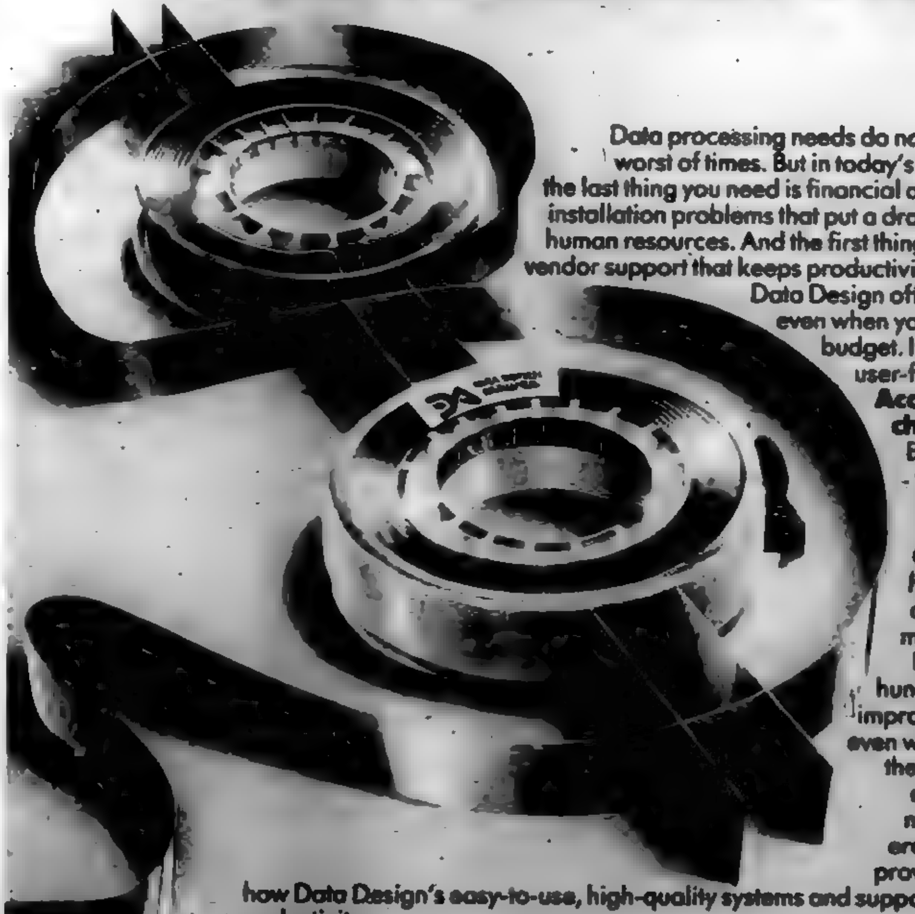
The 410 is available immediately and costs $1,400. The 415 will be available in July and costs $1,595. Both prices are for quantities of 500, the vendor said from San Tomas at Central Expwy., Santa Clara, Calif. 95052.

Epson Introduces Bidirectional Printer

TORRANCE, Calif. — A bidirectional dot-matrix printer that is said to operate at speeds up to 160 char./sec. has been introduced here by Epson America, Inc.

The FX-80 offers a software-selectable choice of elite or pica print spacing, Epson said. Users can also reportedly download special fonts from the host to the printer's memory. It provides 9-dot by 9-dot matrix characters with full descenders and is downward-compatible with the Epson MX series of printers, the vendor said.

This product retails for $699 and is available immediately, the vendor said from 3415 Kashiwa St., Torrance, Calif. 90505.



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Storage Line Released by 3R

WESTBORO, Mass. — 3R Computers, Inc. has added a family of storage devices to its product line that reportedly combine a diskette with a Winchester disk subsystem.

Called the Avatar TC10 Universal Terminal Converter, the system is intended for intelligent workstation users with large local data base requirements, providing up to 20M bytes of on-line disk storage, the vendor said. The design of this product is said to allow users to operate any Digital Research, Inc. CP/M-based application on any Avatar-supported CRT terminal.

The system includes a Zilog, Inc. Z80A microprocessor, three asynchronous serial ports and a Centronics, Inc.-type parallel printer interface, Prices for this series range from $1,995 to $6,095, depending on M-byte capacity from the vendor at 18 Lyman St., Westboro, Mass. 01581.

Digitizer Boards Unveiled

QUEBEC CITY — Two video digitizer boards have been introduced by Matrox Electronic Systems Ltd.

The VAF-512 and QVAF-512 (a Digital Equipment Corp. LSI-11-compatible version) are designed to work with Matrox's RGB-Graph and QRGB-Graph frame buffers to provide a complete Intel Corp. Multibus or DEC Q-bus 512- by 512- by 8-bit imaging system.

The units contain an on-board 10-MHz analog/digital converter for "grabbing" fields of video data with spatial resolution of 512 dots by 512 dots and with either 4 or 8 bits per pixel.

Prices start at $2,150 (U.S.) for a 4-bit unit and $3,150 for an 8-bit unit with delivery in four weeks from Matrox Electronic Systems at 5800 Andover Ave., TMR, Quebec City, Quebec, Canada H4T 1H4.

Billing System Targets Law Firms

TREVOSE, Pa. — Delta Data Systems Corp. has announced a turnkey billing and management system for law offices.

Incorporating the firm's D8000 microcomputer, the Legis legal information system can be used in law offices with between two and 50 members. The system includes Delta Data terminals, between 10M and 40M bytes of Winchester disk storage and dot matrix and letter-quality printers, the vendor said.

The Delta Data system uses the firm's Turbodos operating system, which is compatible with Digital Research, Inc.'s CP/M operating system, the vendor said. The system costs between $21,000 and $25,000, depending on the configuration, the vendor said from 2595 Metropolitan Drive, Trevose, Pa. 19047.

SEL Introduces 32-Bit Mini Line

(Continued from Page 51)

nization that puts all three systems in the two million instructions per second (Mips) category. "With cache hit-rates in the very high 90% range, the 32/67 line is capable of 2-Mips performance," he contended.

Other hardware components contributing to the systems' processing speed include an optional internal processing unit (IPU), which serves as a complement to the CPU and reportedly doubles the systems' performance, an optional floating point accelerator that can be attached to both the CPU and IPU, the Selbus synchronous bus that transfers data at 26.67M byte/sec and 16M-byte addressing capability.

The 32/6705's bare bones configuration consists of the CPU, an I/O processor, 8M bytes of main memory and a single cabinet containing rack space for additional disks and tapes. The 32/6750 basic configuration has the same features as the 32/6705, with the exception of 16M bytes of main memory and the ability to accommodate the optional IPU processor. The top-of-the-line 32/6780 features both the CPU and IPU as standard, with each processor having its own 32K-byte dual cache memory and 16M bytes of main memory.

The three systems are expected to be used in applications involving computer-aided engineering, simulation and in the exploration of oil and gas, the vendor said from 6901 W. Sunrise Blvd., P.O. Box 9148, Fort Lauderdale, Fla. 33310.

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Power Distribution System Unveiled by K/W Control

MIDDLETOWN, N.Y. — A Modular Power Distribution System (MPDS) said to fulfill changing computer room power distribution requirements has been introduced by K/W Control Systems, Inc.

The 415 Hz MPDS was designed to serve up to three separate computer loads from a single 75 kVA 415 Hz input, according to a vendor spokesman.

New CPUs can be added or relocated within the computer room without the need for any new wiring between the motor generator sets or paralleling system and the MPDS itself, according to the spokesman.

The MPDS costs $12,500 from the firm at R.D. No. 4, Box 114C, S. Plank Road, Middletown, N.Y. 10940.

Printer Prices Cut by $600

FORT LAUDERDALE, Fla. — Southern Systems, Inc. has announced a $600 price reduction for its Data General Corp.-compatible printer systems using the data channel controller.

New prices for data channel controller printer systems, typically used with DG's AOS operating system, are now $3,500 to $60,000, depending on the line printer speed required.

The firm's printers range from 55 line/min to 5,280 line/min. Print technologies include matrix, band and ion deposition. Southern Systems is located at 2841 Cypress Creek Road, Fort Lauderdale, Fla. 33309.

Design System Said to Save Engineers' Design Time

SUNNYVALE, Calif. — An interactive computer-aided engineering (CAE) design station said to cut engineers' design time by at least half has been announced by CAE Systems, Inc.

The CAE 2000, based on the Apollo Computer, Inc. Domain minicomputer and the Bell Laboratories, Inc. Unix virtual memory operating system, comes with dual Motorola, Inc. 68000 architecture, 1M byte of main memory, 16M bytes of virtual memory and 34M bytes of local Winchester disk storage, according to a vendor spokesman.

Prices range from $39,990 to $88,690, depending on options, the spokesman said. The vendor is located at 1333 Bordeaux Drive, Sunnyvale, Calif. 94086.

Altos Users Get Disks

SAN JOSE, Calif. — Almaden Systems, Inc. has announced the ASI-8000 series of Winchester disk subsystems for Altos Computer Systems, Inc. microcomputers.

Available in 6M- to 19M-byte configurations, the subsystems use a proprietary host adapter and firmware to permit the subsystem to be directly attached to the Altos processor.

ASI-8000 subsystems cost from $2,895 for a 6M-byte configuration to $3,695 for a 19M-byte configuration. The vendor is located at 6066 McAlbee Road, San Jose, Calif. 95120.

Controllers Out Alone

STAMFORD, Conn. — Digital Associates Corp. has announced that its printer controller/interfaces are now available for purchase as stand-alone products.

This line of controllers reportedly provides plug-compatibility with a range of computer systems including Digital Equipment Corp.'s VAX-11, PDP-11, LSI II and PDP-8 families and IBM's Series/1 and System/34 and System/38 computers.

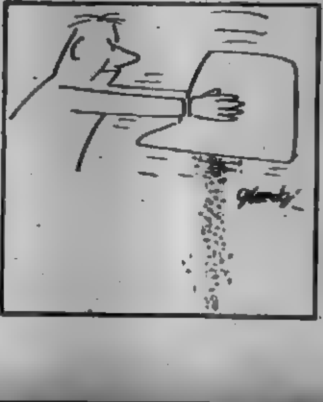
The controller/interfaces range in price from $395 to $2,500, depending on the system. Further details are available from the vendor at 1039 E. Main St., Stamford, Conn. 06902.

Analyzer Unveiled

ORANGE, Calif. — Wilson Laboratories, Inc. has announced the latest member of its family of dual-microprocessor peripheral analyzers.

The MWX-1000 provides fully automatic, semiautomatic and manual testing and analysis of interfaced drives and provides for the automatic logging of test results through a serial printer port, the vendor said. All functions of the drive can reportedly be tested, including bad track and/or sector locations, margins and timings.

The MWX-1000 costs $5,995, the vendor said from 2237 N. Batavia St., Orange, Calif. 92665.



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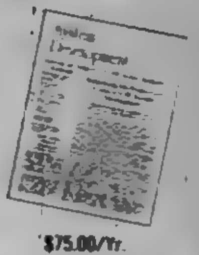

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	LA120 DECwriter III KSR	2,295	220	122	83
	LA120 DECwriter III RO	2,095	200	112	75
	LA12A Portable DECwriter	2,150	206	115	[illegible]
	VT100 CRT DECscope	1,695	162	90	61
	VT101 CRT DECscope	1,195	115	67	43
	VT125 CRT Graphics	3,295	315	[illegible]	119
	VT131 CRT DECscope	1,745	167	93	63
	VT132 CRT DECscope	1,995	190	106	72
	VT18XAC Personal Computer Option	2,395	230	128	86
TEXAS INSTRUMENTS	TI745 Portable Terminal	1,595	153	85	58
	TI765 Bubble Memory Terminal	2,595	245	136	93
	TI940 CRT	1,795	172	96	65
	TI785 Portable KSR 120 CPS	1,795	172	96	65
	TI787 Portable KSR 120 CPS	2,195	211	117	80
	TI810 RO Printer	1,695	162	90	61
	TI820 KSR Printer	2,195	211	117	80
LEAR SIEGLER	ADM3A CRT Terminal	595	57	34	22
	ADM5 CRT Terminal	645	62	36	24
	ADM32 CRT Terminal	1,165	112	65	42
C-ITOH	CIT-101 CRT	1,525	147	82	55
	CIT-161 Color CRT	2,675	257	143	97
	CIT-427 Color Graphic CRT	3,095	297	165	112
TELEVIDEO	910 CRT Terminal	[illegible]	62	35	24
	925 CRT Terminal	850	82	46	31
	950 CRT Terminal	1,075	103	57	39
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	Letter Quality 7725 KSR	3,195	307	171	115
GENERAL ELECTRIC	2030 KSR Printer 30 CPS	1,195	115	67	43
	2120 KSR Printer 120 CPS	2,195	211	117	80
EPSON	MX-80 F/T Printer	[illegible]	71	42	27
	MX-100 Printer	[illegible]	86	48	32
TIMEPLEX	E8000 4 Channel Stat Mux	1,525	147	82	55
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Method to Madness Seen in 8-Bit-Based Systems

(Continued from Page 51)

able and a relatively small amount of 16-bit software — especially 16-bit software that requires a true 16-bit machine," Jon Shirley, Tandy's vice-president of merchandising, said. "The number of packages in that market [16-bit] can almost be counted on a couple of hands.

"For this reason, I think the 8-bit market will remain reasonably alive for another few years," Shirley observed.

He added that owners of small businesses "really don't care" whether their systems contain an 8- or 16-bit chip, as long as it solves their accounting and inventory problems.

Early in January Tandy delivered a C language, a version of Microsoft Inc.'s Basic interpreter as well as Microsoft's multiuser Xenix operating system.

Mike Skelton, marketing director for Altos, agreed with Shirley that the 8-bit system will continue to thrive — at least for the next two or three years — in the business market.'

"There are a number of people out there that are completely satisfied using 8-bit software and have absolutely no need to go to 16-bit. What we are doing with this product [the 580-10] is extending the life of our 8-bit products for another two or three years. With multiuser capability and a hard disk, it is as state-of-the-art as a [Zilog, Inc.] Z80 system can be," Skelton asserted.

Both vendors realized they would have to come up with more than just another 8-bit, single-user, floppy-disk-based system if they were going to distinguish themselves in the business marketplace. For that reason, Altos equipped its 580-10 with a 10M-byte hard disk and multiuser capability, while Tandy has also made a 12M-byte hard disk available for its TRS-80 Model 12, as well as a six-slot card cage that allows it to be upgraded to a 16/32-bit system.

"There is no doubt that a 16-bit system is better equipped for multiuser applications. When you start adding lots of users, you degrade the efficiency of the system. But with only three terminals, our system can handle it. The only problem your get into is if you have a floppy-based system where you have a very slow access time to the data, but we have the hard disk," Skelton noted.

Reduced Access Time

Skelton said the company has not only added memory capacity to the 8-bit system by adding a hard disk, but has made it a viable multiuser system by reducing its CPU's access time to the hard disk from 150 nsec to 90 nsec.

"If we were a start-up company, we would rather come out with a [Motorola, Inc.] 68000-based system running 16 users rather than a Z80 product. But you have to understand a large percentage of our sales is still 8-bit and we have a lot of accounting, word processing and financial packages available," Skelton said.

The biggest problem facing 16-bit computer systems, which is proving to be a boon to 8-bit processors, is the lack of an adequate library of 16-bit programs.

One 16-bit system that has helped prolong the life of 8-bit systems in the business market because of its lack of software is Tandy's own Model 16. While the dual-processor system could draw on the large existing base of Z80-compatible software immediately, the higher level languages that would allow development of 68000-compatible application software and permit the system to use its multiuser capabilities were not made available for almost a year after the system was introduced.

On May 18th, *Computerworld* launches its first communications satellite . . .

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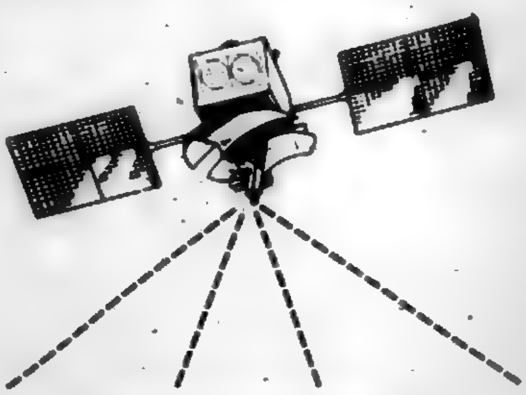

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NYC Pleased With WP System Evolution

By Bob Johnson
CW New York Bureau

NEW YORK — Sophisticated applications and advanced office automation equipment rarely come to mind when one thinks about a large city municipal agency. Normally, shops outside of the private sector are thought to be at least five years behind the times. There is a glaring exception, however, one which originates from the largest user area in the country — New York.

The Department of General Services' (DGS) Division of Financial Management and Administration (DFMA) for New York maintains a Wang Laboratories, Inc.-based word processing and DP operation that the agency claims serves some 350 users with 70 terminals, encompasses three buildings, has a nine-terminal WP training center and saved one of its divisions over $40,000 alone last year.

What started in 1979 as a stand-alone WP system procured to do sorting, has evolved over the years into a heavily used text editing, DP and now communications system. Growth from 1979 to 1981 at the DFMA has continued through Wang System Models 20 and 30, OIS Systems 130 and 140 and now a VS 100. The agency said that configuration increases in terminals and peripheral equipment rose at a rate of 30% every six to 10 months.

According to the DFMA's director of WP management, Dean Plummer, the combination of user-driven capacity needs, a clear career path outlook and a positive push from the DGS' Commissioner's office prompted a swift upgrading of the systems. "The users became addicted to the system once it was in use. The people who took to it began to brag about how it helped and word of mouth spread. And of course, the creatively lazy types saw that it was better to do things on the Wang than on a typewriter," he said.

Plummer added that the former commissioner of the agency who was in charge at that time also contributed to the acceptance of office automation by refusing to read any output which was not produced on the in-house systems.

The DFMA's goals, according to Plummer, revolve around integrating the Division's DP environment so that any record of data could go into WP, record processing or a data base management environment and be absolutely transparent to the user, "We want the user to work stand-alone and be buffered from downtime, but at the same time we want the economy of scale so that we can offer printing features (laser and band), telecommunications to link us with other city systems and user-friendly DP features," he commented.

The DPers wishes are beginning to take shape. Currently, the DFMA has a configuration centered around a Wang VS 100

(Continued on Page 62)

Wang Offers WP Packages

LOWELL, Mass. — Wang Laboratories, Inc. is now offering versions of its list processing and spelling verification software on the entry-level OIS 105-1 and OIS 115-2 word processing systems.

OIS Small List Processing (OIS-SLP) allows the user to create a file, add new records, modify and delete selected records and merge documents.

The OIS Small Spelling Verifier (OIS-SMspell) is said to allow users spelling verification of a word processing document with a 30,000-word master dictionary.

OIS-SLP is available for an initial license fee of $500 and an annual license fee of $60. OIS-Smspell is available for an initial license fee of $500 and an annual license fee of $60 from Wang Laboratories, One Industrial Ave., Lowell, Mass. 01851.

Management Console Targets Small WP Shops

ATLANTA — Lanier Business Products, Inc. has introduced a management console for small word processing centers, specialized departments and small hospitals.

The Lanier Supervisor directs work flow as it comes into the station from a variety of input stations or through the user's own telephone. It distributes the work evenly among the vendor's endless-loop recorders. It is available for $2,495 for the console only.

Also introduced is the Super-Vision IV, a management console designed to manage work flow in word processors and specialized centers. It is available for $10,995 for the console only.

Lanier is located at 1700 Chantilly Drive, N.E., Atlanta, Ga. 30324.

WP Software for Unix Updated for Unistar

SAN DIEGO — Callan Data Systems, Inc. has announced that the Computer Methods, Inc. word processing software package designed to run on computers running Bell Laboratories Unix operating system will now run on Callan's Unistar desktop system.

Easytype features letter generation, global search and replace, mail display and automatic pagination. It also chains documents together through horizontal and vertical scrolling with print spooling capabilities. It is available for $595.

The vendor also announced that Ada, the Department of Defense-sponsored high-level programming language, will also run on Unistar. It is available for $3,500. More information is available from Callan Data Systems, 2637 Townsgate Road, Westlake Village, Calif. 91361.

E-Mail Aid Out for IBM 3270's

LONG BEACH, Calif. — LaBayne & Associates, Inc. has introduced an electronic mail package said to extend the existing IBM 3270 or compatible terminal and utilize full-screen capability. It runs within a computer network operating under IBM's DOS, OS and CICS software.

EMS is designed for users with dispersed locations.

The package is available for $4,500 with a 30-day free trial. LaBayne & Associates can be reached at Suite 210, 12535 Seal Beach Blvd., Seal Beach, Calif. 90740.

Sperry Offers OA Consulting

BLUE BELL, Pa. — Sperry Univac is now offering a free office automation consulting service to users of its Sperry Link Office System.

The Sperry Consulting Group (SCG) will aid users in tailoring the office system to their needs, a vendor spokesman said. The skills represented in SCG are those of consultants offering analysis of user needs, cost justification, strategic planning, decision support, system security and network planning.

Sperrylink is an integrated office system for medium-size to large organizations.

More information is available from Sperry Univac, P.O. Box 500, Blue Bell, Pa. 19424.

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Gemini System Gets File Searcher

NEW YORK — An electronic file software package for its Gemini office automation system was introduced by Syntrex, Inc. here last week.

The Electronic File Room (EFR) is capable of finding any kind of data within an electronic file by building an index to every document in the file and using every word in the document, according to Syntrex.

The company explained that any document can be retrieved by naming a few words that were used in the text. The EFR searches across the electronic file hierarchy as well as file rooms linked together by local-area networks, Syntrex said. It can also search based on criteria not contained in the text.

Another feature of the EFR is a no-fail system with built-in duplicate monitoring. All incoming information is recorded on separate hard disks connected to each half of the package. If a malfunction occurs, operations are transferred to the good half and a built-in Service Genie automatically dials a Syntrex service center.

The EFR is immediately available and is priced at $3,900. More information is available from Syntrex at 246 Industrial Way W., Eatontown, N.J. 07724.

Sanyo Offers FAX Product

NEW YORK — Sanyo Business Systems Corp. has introduced a facsimile machine that reportedly is compatible with all other facsimile machines and that transmits in as little as 20 seconds.

The Sanfax 825 also features automatic answer, automatic speed/mode selection and automatic paper cutting. The automatic size reduction scales copy down from 10 in. to 8½ in., and the document feeder transmits stacks of up to 30 documents.

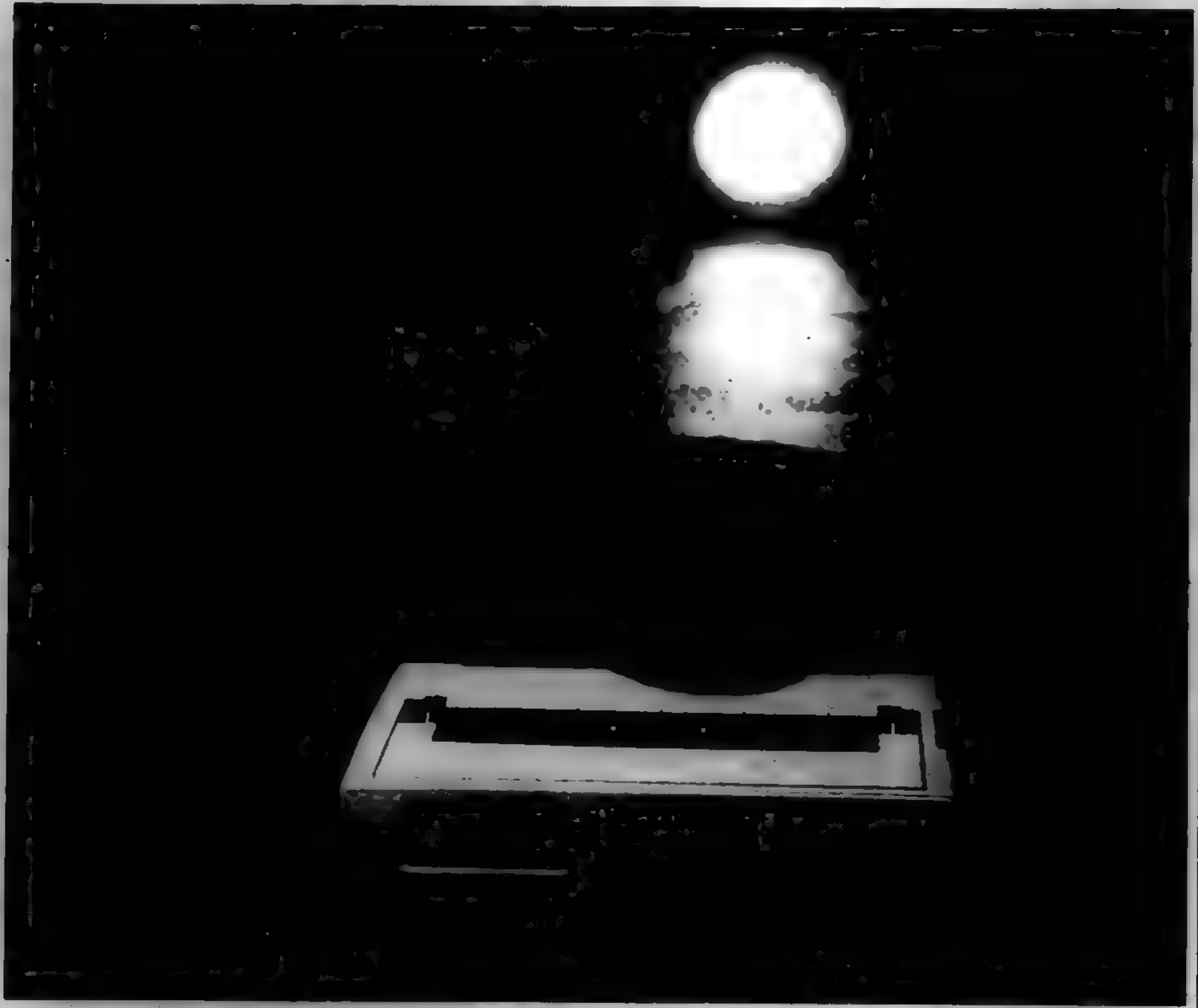
The facsimile machine is available for $7,500 from Sanyo Business Systems, 51 Joseph St., Moonachie, N.J. 07074.

City Updates WP System

(Continued from Page 59)

CPU with 3M bytes of core storage and 300M bytes of removable disk storage. The shop also has three telecommunications lines: one is hooked up to the city's central IBM mainframe at the Division of Computer Services (DCS); another accommodates batch transfer processing over Manhattan Cable TV data transfer lines — the DFMA noted that the use of the cable TV lines will save the city nearly $100,000 in fiscal year 1984 — and the last connects to a financial data base. The DFMA is also two-thirds of the way through the installation of Wangnet local-area networks, Plummer said, which will eventually link all of the agency's three buildings.

Two Wang band printers for local printing and two LPS-12 laser printers connected to the system at the DCS are also part of the system, Plummer noted. Additionally, an OBM Corp. optical character recognition device is now being used for hand written numeric recognition of payroll applications and the tracking of a bus-stop guide application that the DFMA said fit well into the system's WP and communications capabilities.



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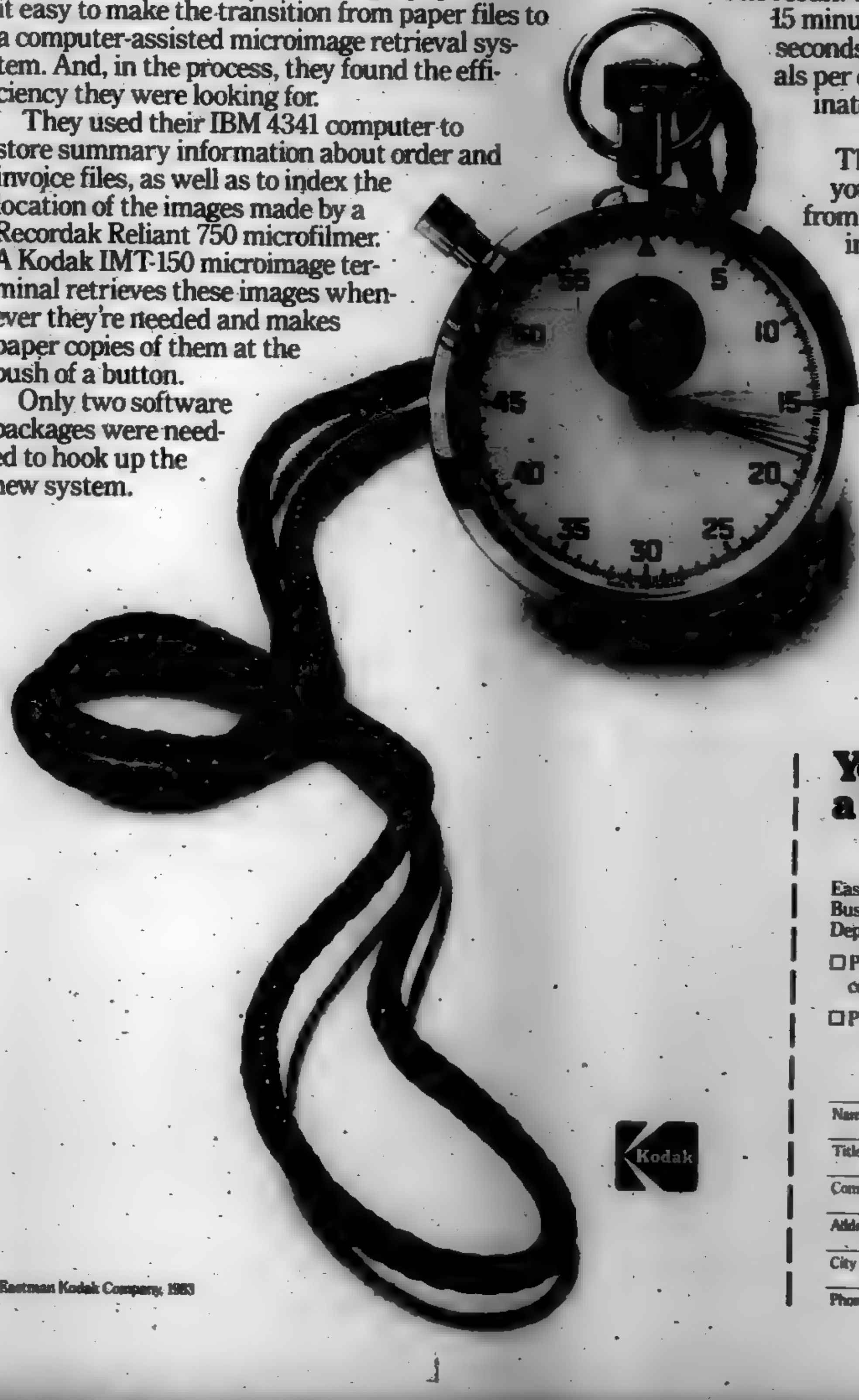

This manufacturer of typesetting equipment found it easy to make the transition from paper files to a computer-assisted microimage retrieval system. And, in the process, they found the efficiency they were looking for.

They used their IBM 4341 computer to store summary information about order and invoice files, as well as to index the location of the images made by a Recordak Reliant 750 microfilmer. A Kodak IMT-150 microimage terminal retrieves these images whenever they're needed and makes paper copies of them at the push of a button.

Only two software packages were needed to hook up the new system.

The result? Lookup time was slashed from about 15 minutes with the old manual system to 10 seconds or less for each of 100 to 200 retrievals per day, and misfiling was virtually eliminated. Their 40 five-drawer file cabinets were gracefully retired.

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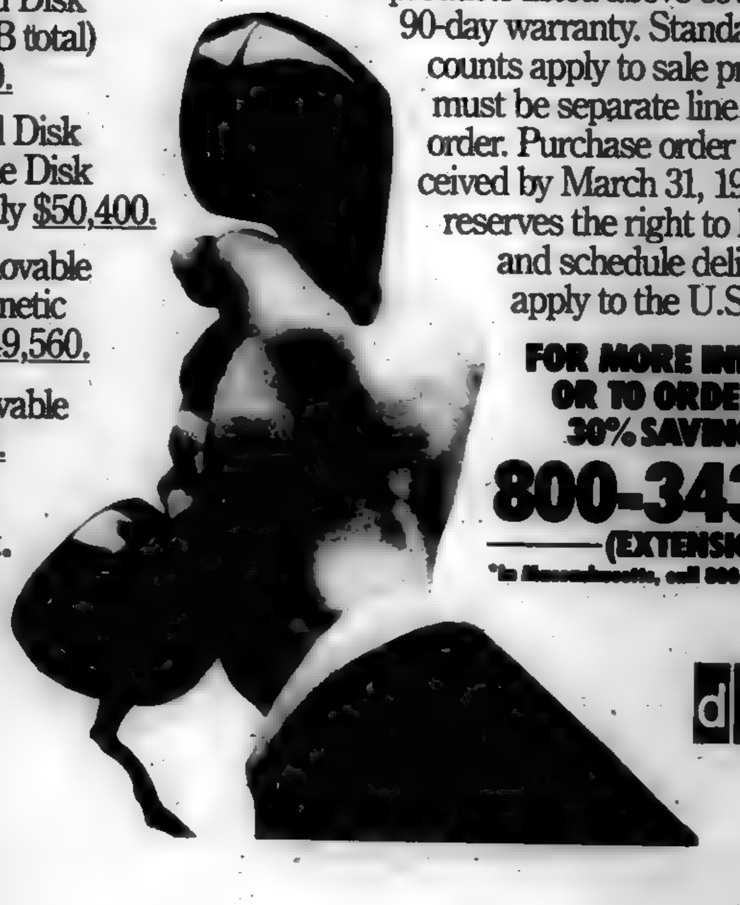

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For New CAD/CAM Strategy

Perkin-Elmer in Pursuit of OS Experts

By Bill Laberis
And Lois Paul
CW Staff

WALTHAM, Mass. — Perkin-Elmer Corp. is hunting for IBM OS experts as it prepares to sail a new tack in its long-range computer-aided design and manufacturing (CAD/CAM) strategy.

With what company officials promise will be "a major and important announcement" in late April or May, PE will begin to drift away from an IBM host-based CAD/CAM environment to one anchored solely by PE 32-bit minis.

The key to this change in long-term strategy lies in PE's ability to convert more of IBM's CAD/CAM applications to run under PE's operating software.

Barry Rosenbaum, director of PE's recently formed CAD/CAM group, said in an interview last week, "Our approach will be to take advantage of the fact that almost all the [CAD/CAM] software written in the world runs on IBM.

Independent Strategy

"Our new strategy is to become more independent of an IBM host system in the CAD/CAM environment," Rosenbaum continued. "We want to be able to go to a user and say, 'Hey, you don't need a host. We can give you everything you need.' "

Rosenbaum stressed that PE will continue to offer enhanced support for the legions of PE's minis operating in IBM host-based shops. But he also strongly hinted of PE's future CAD/CAM orientation with his claim that "only about 10% of the [CAD/CAM] users really require a big host to do business."

PERKIN-ELMER

"And for those users requiring a host-based CAD/CAM system, Rosenbaum said PE "fully intends to come up with our own host system, one that will be based around our own multiprocessors."

PE has been competing in an IBM CAD/CAM environment since the '70s, Rosenbaum said, when Lockheed Corp. converted its Cadam software, formerly run on IBM machines exclusively, to run on PE systems. Lockheed has 55 PE processors running Cadam, and PE began marketing the package about a year ago, Rosenbaum said.

Cadam essentially allows much of the actual CAD/CAM processing to be accomplished by the PE machines, with the IBM mainframes serving to maintain a data base of drawing files.

But with its recent advertisements in search of OS support specialists, PE is looking to expand its Code Compatible Machine, which Rosenbaum described as

(Continued on Page 72)

IBM's Program Restrictions Get Mixed Reviews From Vendors

By Bill Laberis
CW Staff

WHITE PLAINS, N.Y. — The vendor community jury may be out for a while more before a consensus is reached on IBM's recent announcement that it will restrict or eliminate program materials from certain of its licensed programs.

Some vendors contacted last week said the policy change will have little or no affect on current or future operations, while others expressed a sense of foreboding that IBM is flexing too much muscle over independent software vendors, particularly system software houses.

But everyone contacted agreed on one point: The full impact of the IBM an-

(Continued on Page 76)

Lee's Theory C Boosts ATS

Shop's Terms Keep Employees

By Marguerite Zientara
CW Staff

FREMONT, Calif. — Hundreds of dollars in monthly cash prizes, a presidential open-door policy and clearly stated career paths have pushed turnover below 10% at Advanced Technical Services, Inc. (ATS) here.

These and other attractions are manifestations of what ATS President and Chief Executive Officer Huey Lee calls his Theory C school of management. Based on common sense and the Golden Rule, Theory C underlies all activities at ATS, which provides printed wiring board assembly and manufacturing services for electronics firms here in Silicon Valley.

"Repetition of microtasks often leads

(Continued on Page 70)

Huey Lee

Micros, ICs Prod Software Design

By Robert Batt
CW West Coast Bureau

The proliferation of microcomputers in large corporations and the growth of the information center are the main forces propelling the strategies of leading software vendors in 1983.

This conclusion was reached from a series of telephone interviews conducted recently with major software houses around the nation.

(Continued on Page 66)

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Court Upholds IBM-Transamerica Decision

SAN FRANCISCO — A federal appeals court has upheld a lower court decision that exonerated IBM of charges that it violated antitrust law as charged by Transamerica Corp.

Transamerica's former computer leasing wing had charged that IBM had monopolized the computer and peripherals markets, using predatory pricing to drive out its competition.

The appeals court ruled it would be difficult to distinguish between predatory pricing and legitimate price cuts designed to meet or beat the competition. This ruling upheld one reached by a district court judge in 1979, handed down after a 120-day trial ended in a hung jury.

Micros Prod Software Vendors

(Continued from Page 65)

Outlining the problem facing vendors, John Cullinane, president of Cullinet Software, Inc., formerly known as Cullinane Database Systems, Inc., explained: "The twin dilemma of the '80s for data processing will be to reduce the applications backlog and to support users via the information center concept."

John P. Imlay Jr.

The requirements to implement this concept are demanding, Cullinane said. "By definition, the information center should provide direct access by all decision makers to pertinent information. The obstacles have always been that the software available and thought to be user-friendly does not have direct access to the production data bases. And quite frankly, those same languages lack sufficient power," he added.

In an attempt to solve these difficulties, several software vendors are developing decision support systems that they hope are comprehensive enough to meet the requirements of the information center concept. They plan to do this by supplying more on-line products and by providing integrated support for those personal computers that are now infiltrating large corporations.

John Imlay, chairman of MSA, Inc., said a major focus of his company's efforts this year will be to provide a combination of micro and mainframe software. "The personal computer has become a workstation, of which there will be 35 million by 1990. Users are looking at mainframe software as a source of data to be accessed by middle managers as well as DP professionals. At the same time, DP needs to retain some control over the transmission of data from a mainframe to a micro."

At McCormack & Dodge Corp., the emphasis is on providing two-way access linking micros and mainframes. In addition, the company claimed it is spending a lot of time and money developing generic software code that will perform typical functions common to many applications.

"Micros are going to be everywhere doing everything, particularly in large companies. At the same time 70% to 90% of business applications require the same software application functions," noted Jim McCormack, chief executive.

According to Jack van Kinsbergen, president of Boole & Babbage, Inc., support services are going to be vital to the success of software companies in the '80s. "The information center will require huge data centers and it is important that the user can plan and predict what demand in the data center is going to be. For users to do this they need more sophisticated tools than are now currently available. Users are going to demand ever greater support because with everybody going on-line, there is a demand for faster response times."

Van Kinsbergen said Boole & Babbage will concentrate this year on its new Information Resources Planning and Control product, reportedly designed to provide both a capacity planning and performance management capability.

John Cullinane

Merritt M. Lutz, group vice-president at Informatics General Corp., agreed that support services are going to be vital to overall success.

"Successful companies will have the ability to develop strategic products, that is, products that users can rely on," he said. "The choice of software is now as strategic a decision as the choice of hardware, and the sophisticated user is looking for long-term solutions to his problems."

Lutz said a key part of Informatics' strategic planning is to create data bases that are relevant to individual entities within a corporation.

Prime Discount Schedule Out

NATICK, Mass. — A hardware discount schedule is the backbone of the Authorized Distributor Program introduced recently by Prime Computer, Inc. The program was designed to blend Prime's former value-added remarketer, dealer and system builder channels into one cohesive distributor network.

The program enables system houses to expand vertical market penetration by reselling their applications software on the company's line of 32-bit systems.

"We intend to strengthen our relationship with current Prime resellers, expand our distributor network and deepen our market penetration," a spokesman said.

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CSC Goes to Trial May 16 on Bribery Charges

By Jake Kirchner
CW Washington Bureau

ALEXANDRIA, Va. — A federal judge here has set May 16 as the date for the trial of Computer Sciences Corp. (CSC) and five former and current employees charged with bribery and overbilling in connection with a large federal time-sharing contract.

The trial on the October 1980 indictment was delayed two years after presiding Judge Richard L. Williams dismissed the charges on procedural grounds. Most of the 57-count indictment was later reinstated by a federal appeals court, although more serious charges against CSC of bribery, racketeering and conspiracy were thrown out.

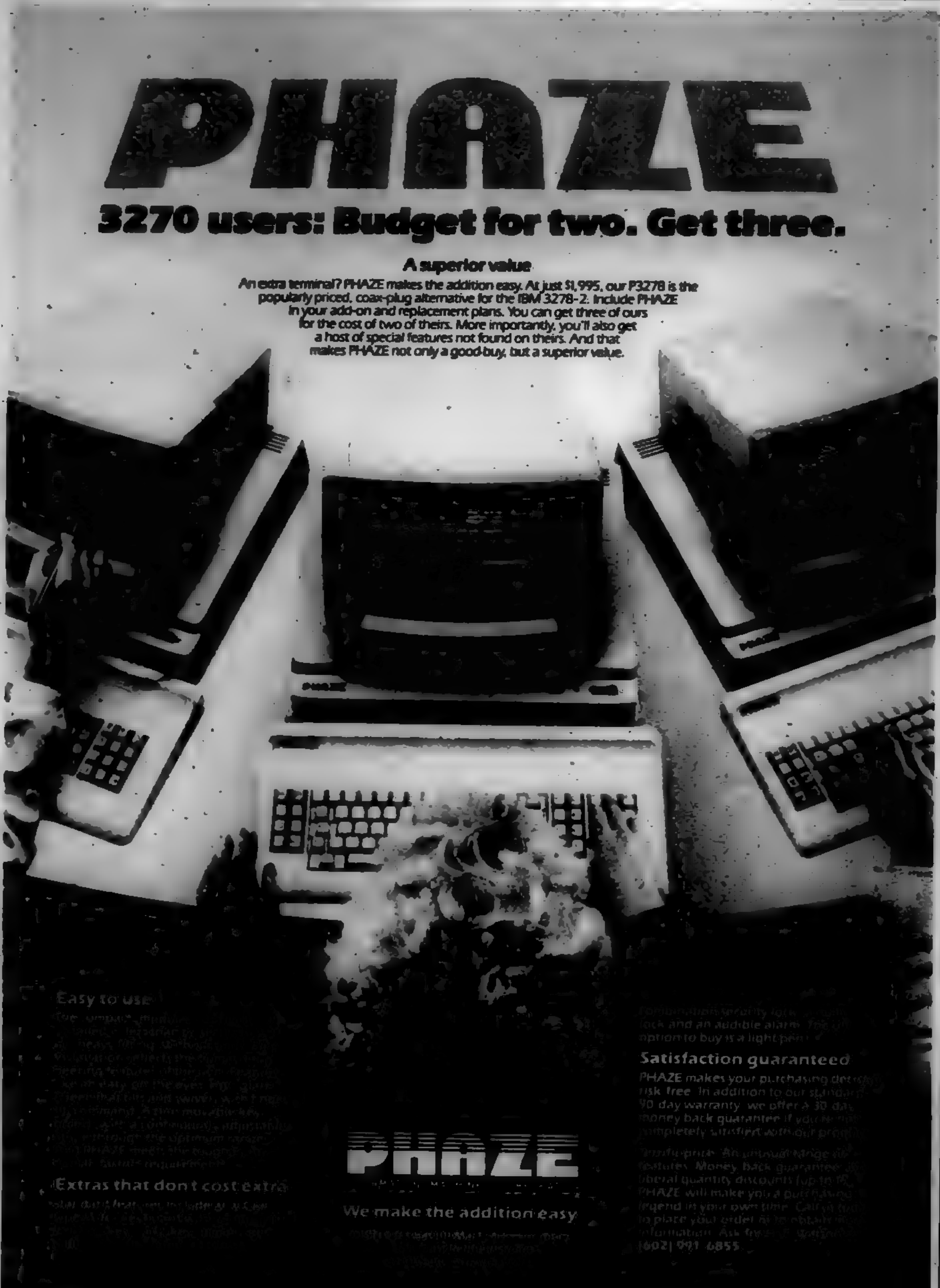
Those counts and charges of wire and mail fraud in connection with billing the government remain against the firm's employees: John W. Luke, former president of the company's Infonet Group, which obtained the contract, and Infonet employees Thomas A. Marti and Norman W. Derrick. Other defendants are former CSC employees Erwin L. Allen, one-time Infonet vice-president, and Peter C. Loux, former CSC branch manager. Also indicted on these charges was Herbert G. Blecker, president of Icarus Corp., a Maryland subcontractor to CSC on the Infonet contract.

CSC must defend itself against lesser charges that it fraudulently overbilled the government as part of its National Teleprocessing Services Contract, which brought CSC more than $100 million between 1972 and 1977.

The original indictment said the defendants conspired to bribe James C. Lindsey, a General Services Administration contracting officer, who allegedly gave CSC employees inside information on the contract bidding in return for $34,000 and a job with a separate corporation set up by CSC to hide the fact the firm was Lindsey's real employer.

In addition, the indictment charged the defendants with billing federal agencies at a higher rate for time-sharing services than paid by Infonet's commercial customers.

According to information obtained by the Justice Department during its investigation of the Infonet contract, CSC went to great lengths to hide the rate difference. A former CSC-retained attorney said that this allegation included a CSC decision not to defend itself against an unrelated lawsuit after Infonet's Allen realized the action might disclose the firm's billing practices.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ATS' Founder Lee Practices What He Dreamed

FREMONT, Calif. — It was 30 years ago that Huey Lee emigrated penniless from China to California.

He enrolled at San Jose State University, where he received a bachelor's degree in electronic engineering. He then studied biomedical engineering and digital system design at the University of Santa Clara, while working toward a master's degree in business administration there.

Prior to founding Advanced Technical Services, Inc. (ATS) in 1977, Lee worked for several Silicon Valley electronics firms, in addition to inventing and marketing medical electronics devices with his wife, May, a medical technologist.

"When I was an employee, there were a lot of things that I was telling myself, if I were the employer this is what I wanted to do," Lee recalled.

Market research studies Lee undertook in graduate school alerted him to the need for electronic manufacturing firms, so he founded ATS. "When I started the business, here in Silicon Valley, talent was very hard to find," Lee explained.

"I was looking for a method from which I could obtain and acquire the talent as well as keep the talent," he added.

"I did a very extensive survey on the personnel management of many companies and put that together with my personal experiences.

"In addition, I read a lot about Theory Z and I found out that really there aren't too many secrets in this personnel management business."

"All I have to do is use my common sense, treat people the way I want to be treated myself, put myself in their shoes and think that way.

ATS Working Conditions Attract, Keep Employees

(Continued from Page 65)

to low morale, absenteeism, poor quality control and high turnover," Lee pointed out. Taking aim at these problems, Lee translated the Golden Rule — "Do unto others as you would have them do unto you" — into working conditions he hoped would attract and keep workers.

Much of Lee's theory — which he concedes "sounds simplistic" — comes from his two years on the assembly line in the early days of ATS. Although he was the company's founder, with only five employees in 1977 Lee found himself jockeying between assembly and management jobs.

But it is not only assembly line workers who are said to benefit from Theory C. ATS now employs 300 people who reportedly gain from Lee's experience and empathy.

For example, Lee assigns top priority to listening to employees. "People can knock on my door anytime," Lee said. "If I'm with a client, I'll get back to the employee as soon as possible."

Open-Door Policy

"An open-door policy gives employees a direct pipeline to the top — for discussing suggestions, grievances or personal problems," Lee said. "They're reassured that someone will listen to them — and act, if necessary."

Does such a policy cause bad feelings when an employee goes over the head of his immediate supervisor? "No," according to Lee, "because I instruct my managers to be open to that type of situation. As long as the problem is solved, that's what we're interested in; we're not interested in pointing fingers.

"Workers are told to go through the chain of command and to come to me only if they get no satisfaction," he added.

"And our basic management training includes three months of 'boot camp,' when trainees work side by side with assemblers, so they know what the issues really are."

Other Examples

Other examples of bottom-up communication include quality circle meetings and employee-management group discussions.

Furthermore, in a labor-intensive industry like electronic assembly, the key to profits lies in motivating people to maintain good attendance and produce quality work.

To that end Lee has developed an incentive program in which he gives away about $50 monthly to five or six employees with perfect attendance and to three "Employees of the Month," who are judged on "cooperation, attitude and performance," he explained. Attendance has increased by 20% to about 90% since the program started, he noted.

In addition to general meetings, ATS schedules special meetings for high-level executives and for lower management. Management totals about 25 people.

ATS has also established a point system for evaluating employees. Those who excel receive four raises a year.

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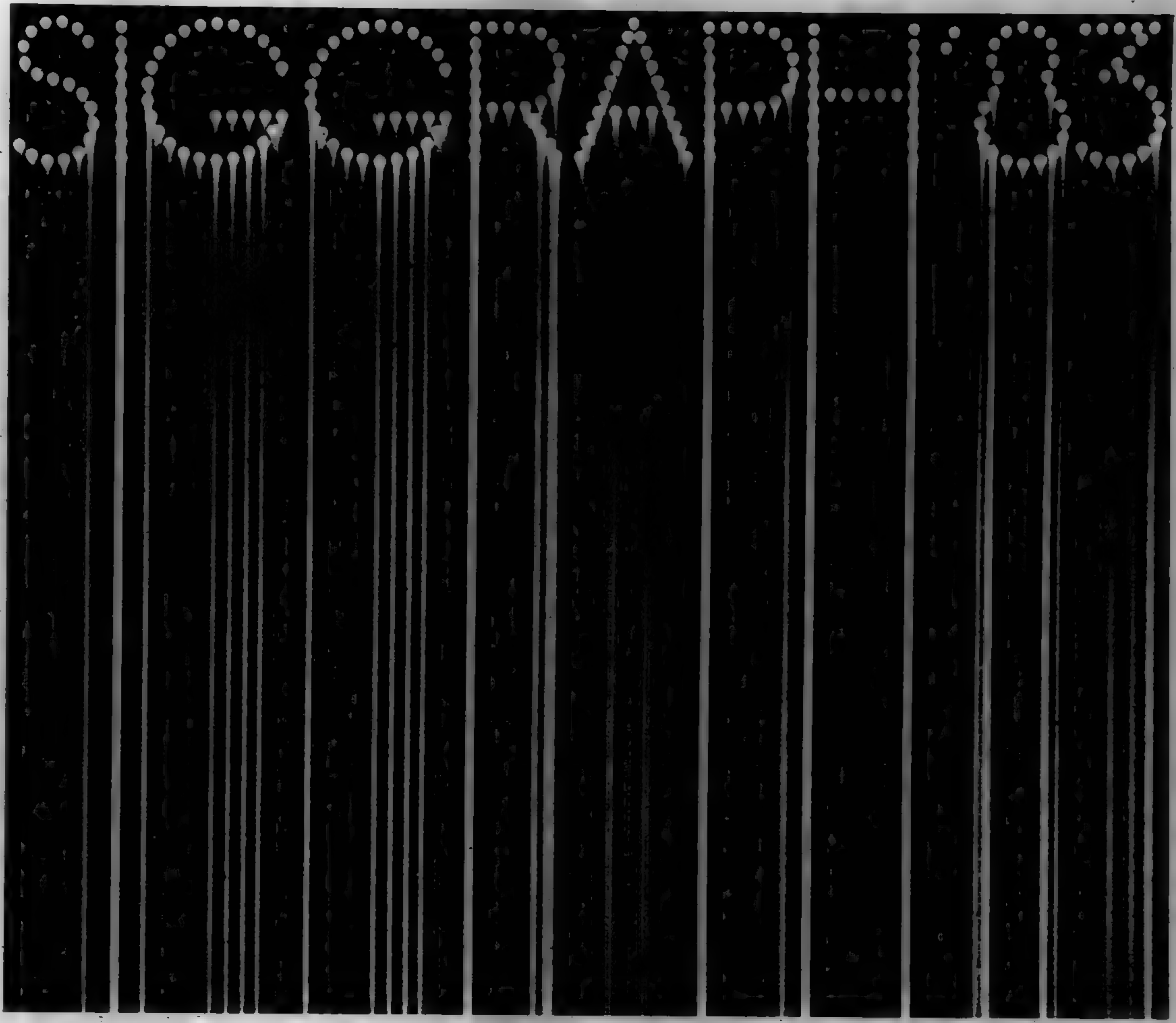

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Geared to Small Business

DEC Retail Outlets Renamed

MERRIMACK, N.H. — The Digital Equipment Corp. retail computer outlets have been renamed Digital Business Centers and recommitted to "developing computing solutions exclusively for small businesses and professional offices," the company announced.

The 25 stores will now, among other things, be used to demonstrate DEC's VAX-11/730 and PDP-11 minicomputers. The first cities targeted in the effort include Miami, Baltimore, Cherry Hill, N.J., and San Antonio, Texas. The centers will offer general accounting solutions for small businesses and professionals and will target vertical industries.

In addition to the minicomputer demonstrators, the centers will carry a line of printing devices, accessories, supplies and tailored software packages, DEC added.

Tymnet Announces Expansion Plan

SAN JOSE, Calif. — Tymnet, Inc., a subsidiary of Tymshare, Inc., has announced an expansion program that reportedly will extend local phone-call access to its public packet data communications network from an additional 150 U.S. cities.

Thus by midyear, users in more than 400 U.S. cities will have local access to Tymnet, according to the firm. The expansion will also provide additional access ports in existing cities and increase the number of high-speed ports by upgrading local-access facilities.

Local availability of data services reportedly will be extended to most locations with populations of 85,000 or greater.

National Semi, DTS Deal on Hold

SANTA CLARA, Calif. — The Antitrust Division of the U.S. Justice Department wants to see more information on both companies before it will approve the intended acquisition of Data Terminal Systems, Inc. (DTS) by National Semiconductor Corp.

Because of the Justice Department request, National Semi has announced that it will extend its offer to purchase 4.3 million shares of DTS stock until March 7.

This marks the second time since the acquisition announcement of last month [CW, Jan. 24] that the government has asked for more market and company information.

PE Eases IBM Out of Strategy

(Continued from Page 65)

firmware emulation of certain portions of an IBM instruction set.

Rosenbaum said the software emulation will not make plug-compatible machines out of PE processors, as the PE machines will not run under IBM's operating systems and will not support IBM-compatible peripherals.

'Screwing Around'

Speaking of PE's ongoing software conversion effort, Rosenbaum said, "It turns out that all the screwing around that we do when we attempt a conversion usually involves some strange usage of the IBM operating system by the applications program. I basically want OS experts to figure out what the applications program is trying to do and to figure out how we solve that problem on our own system. This is altogether different from our current strategy, which is to be anchored to the IBM host."

Thus, PE appears to be positioning itself to compete more effectively and independently in what is a burgeoning CAD/CAM marketplace.

A recent study of Predicasts, Inc., a Cleveland consulting firm, estimated that the CAD/CAM applications market will grow by 41% annually throughout the early '80s and that the 4,600 installed CAD/CAM systems in place at the end of 1981 will blossom to 190,000 in 12 years [CW, Oct. 18].

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Over Possible Trade Wars

Futurist Paints Bleak Picture

By Jake Kirchner
CW Washington Bureau

With the growing sentiment in the U.S. and abroad for increased trade restrictions aimed at protecting native industries, the outlook for American DP and telecommunications vendors and users grows bleaker every day. One industry executive, Charles P. Lecht, sees nothing good resulting from this possible trade war between the U.S. and its trading partners.

Among other likely effects of a high-technology trade war, there would be a drastically diminished American influence in the world's computing community, predicted Lecht, president of Lecht Sciences, Inc. and former chairman of Advanced Computer Techniques Corp.

"In the computer manufacturing area, one thing you might note," he said, "is that virtually 100% of all the [million instructions per second (Mips)] being used in the world are being used on computers of American manufacture and/or design ... The only viable products in companies such as ... [ICL Ltd., Olivetti Co., Toshiba Corp.] and NEC are all ... of American manufacture and/or design. So insofar as increased trade isolationism [is concerned], all that will do is stimulate a trend away from that and it will hurt the American manufacturers ... I'd say that within five years it will start to hurt us enormously. In the short term, it will aid our manufacturers to be able to ... purvey their systems in America like a controlled substance."

Even though some U.S. firms, notably IBM, derive as much as 50% of their revenues from overseas operations, Lecht said they could make up in U.S. sales the revenues they might lose if foreign markets are closed to them in retaliation for a closed American market.

"What [U.S. firms] see is the handwriting on the wall, anyway, because new, modern processors are clusters of chips from heterogenous machines." This means, he explained, that "a product of Toshiba's orginal design, [for example], will in the future be able to run IBM programs," and, therefore, "the main impediment to switching to a computer which is of radically different architecture has been eliminated — namely, the need to convert.

"When the new processors emerge, like the Japanese fifth-generation computer, and that computer will run programs of foreign origin through emulation or even conversion, the motive not to buy the local system vanishes. You might say 'How the hell can they run it through emulation? It would never be as fast as with native code.' You might notice that the cost of modern computer systems is increasingly in the peripherals and not in the CPUs; therefore, many Mips may be wasted to provide emulation that looks like a virtual speedup without increasing the price of the computer materially at all."

According to Lecht, in a few years the CPUs in systems such as the IBM 4300 line will account for no more than 10% of the total system price. "So even if you double the Mips, it still wouldn't be 20% of the [total] cost ... This now will allow a company like [Fujitsu Ltd. or Siemens AG] to create processors that are much more powerful than they announce. And that extra power can be used to emulate foreign machines, machines in fact that previously gave [users] nightmares because of conversion problems."

Lecht added that this development is inevitable, no matter what the trade situation and reiterated that U.S. firms are well aware of this — a fact that will make it easier for them to support trade barriers, although they now fervently espouse free trade. "I think they are going to have

(Continued on Page 78)

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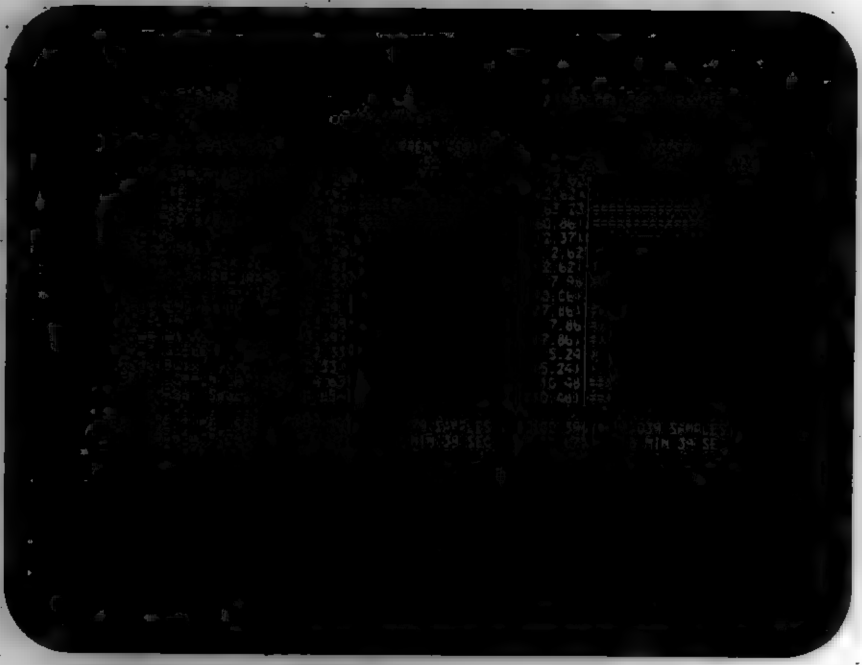

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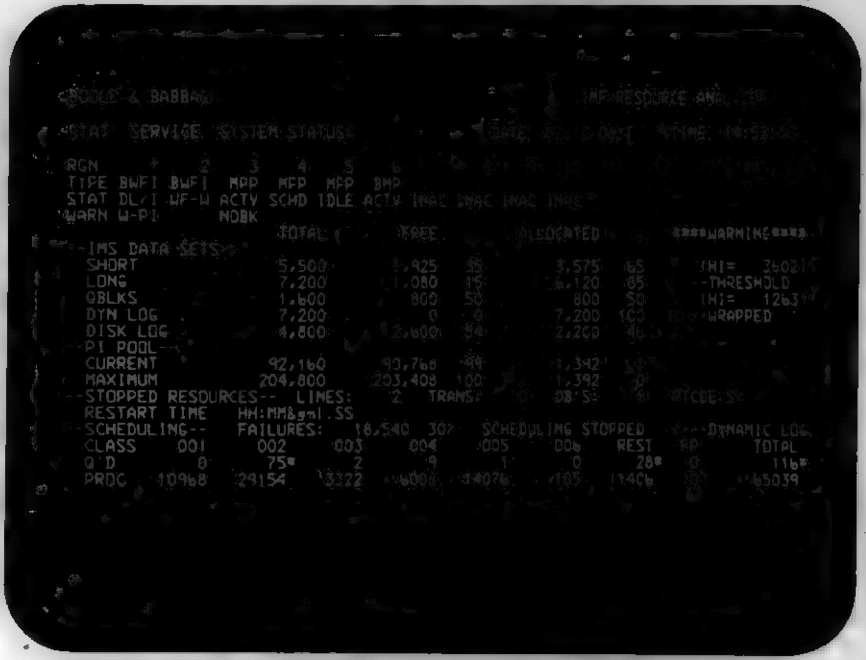

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 RGN     1    2    3    4    5    6
 TYPE BWFI BWFI  MPP  MPP  MPP  BMP
 STAT DL/I WF-W ACTY SCHD IDLE ACTV INAC INAC INAC INAC
WARN W-PI       NOBK
                          TOTAL        FREE          ALLOCATED       ****WARNING****
--IMS DATA SETS--
   SHORT                  5,500       1,925  35         3,575  65     (HI=   3602)
   LONG                   7,200       1,080  15         6,120  85    --THRESHOLD
   QBLKS                  1,600         800  50           800  50     (HI=   1263)
   DYN LOG                7,200           0   0         7,200 100    --WRAPPED
   DISK LOG               4,800       2,600  54         2,200  46
--PI POOL--
   CURRENT               92,160      90,768  99         1,342   1
   MAXIMUM              204,800     203,408 100         1,392   0
--STOPPED RESOURCES--  LINES:    2  TRANS:     DB'S:          RTCDE'S:
   RESTART TIME   HH:MM&gml.SS
--SCHEDULING--    FAILURES:    18,540  30%  SCHEDULING STOPPED  <---DYNAMIC LOG
   CLASS     001      002      003     004     005     006    REST   RP      TOTAL
   Q'D         0      75*        2       9       1       0     28*    0       116*
   PROC    10968    29154     3322    6006   14076     105    1406    0      65039
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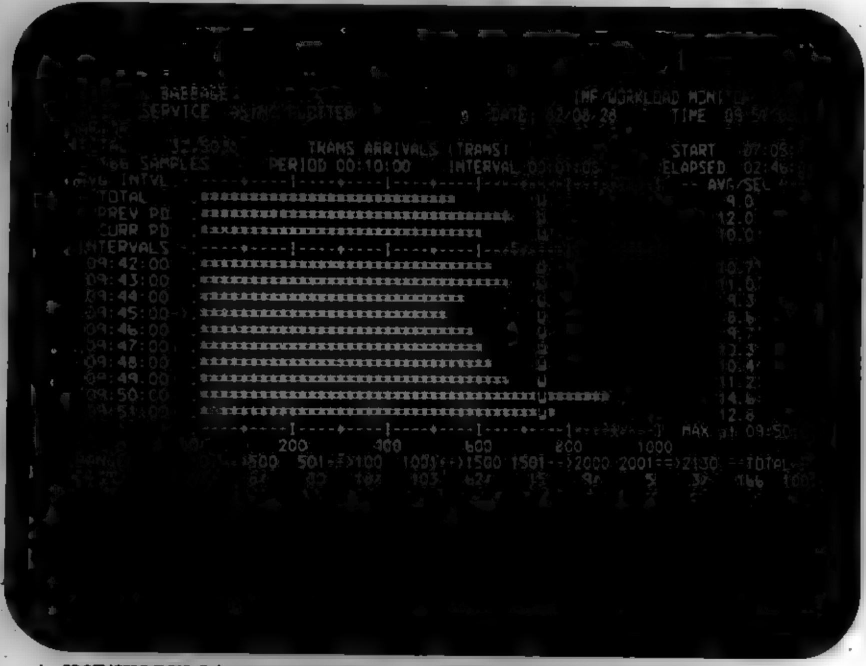

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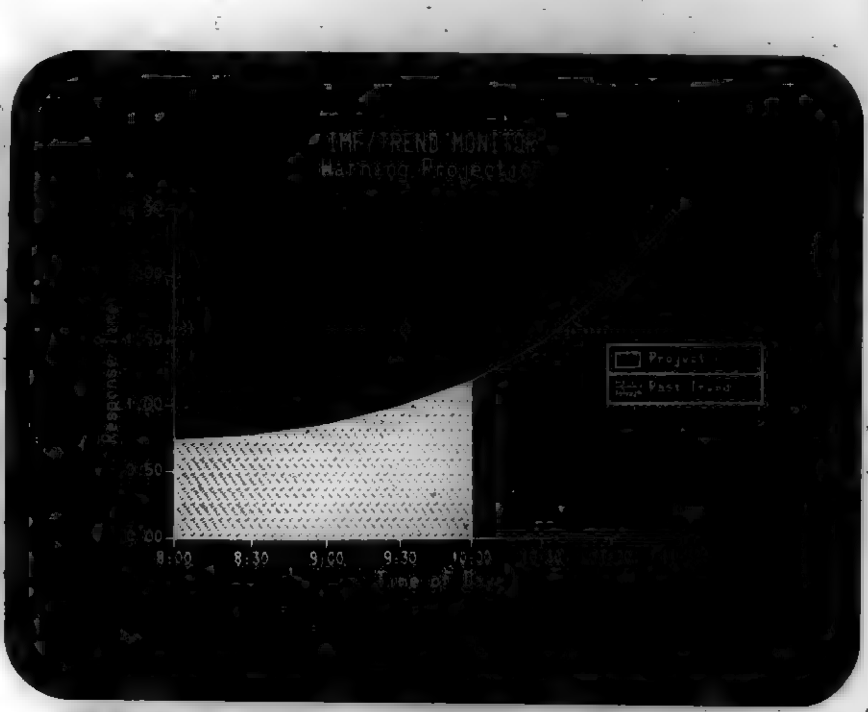

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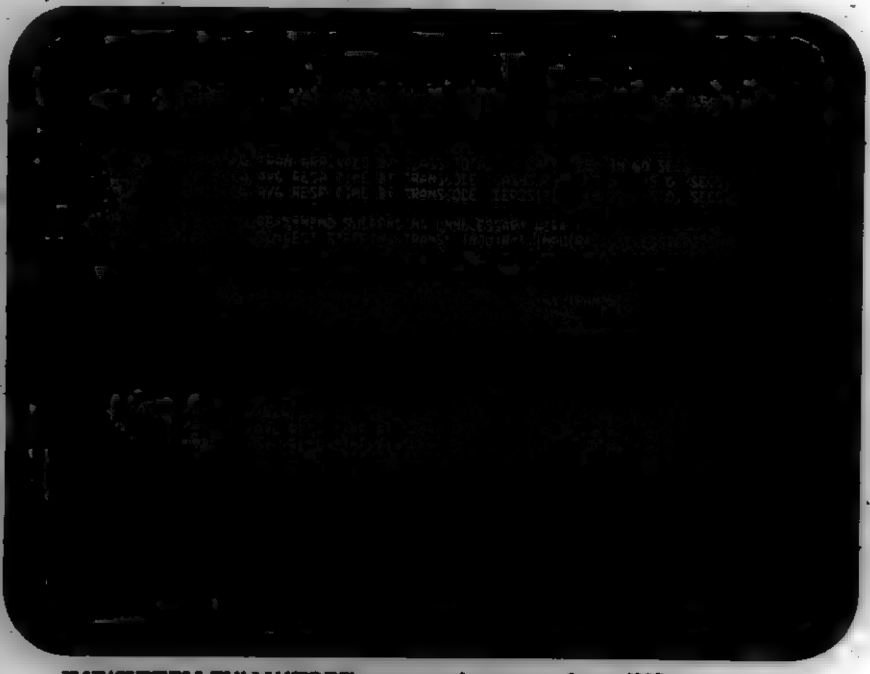

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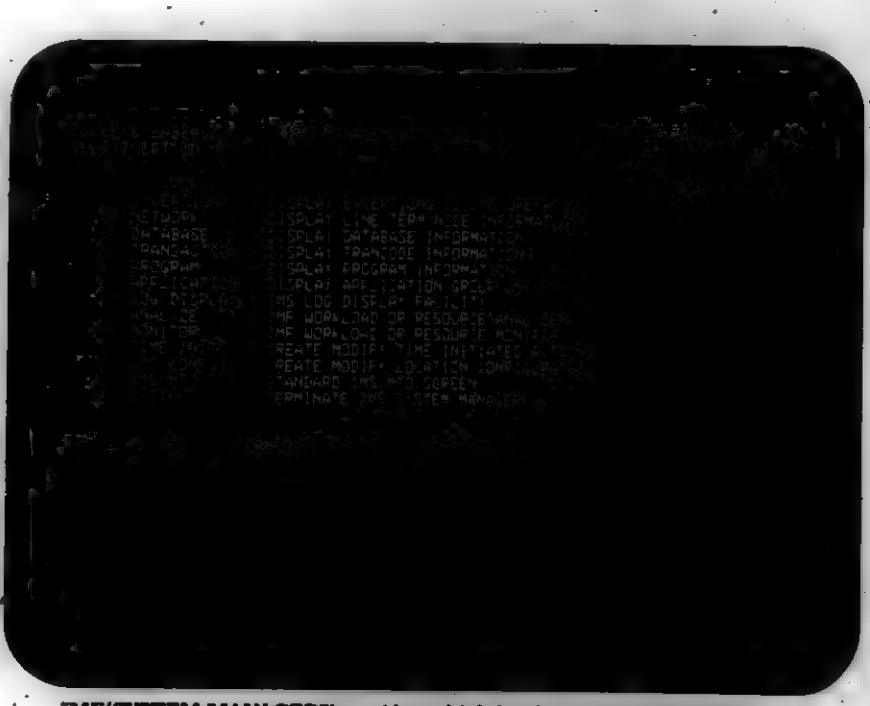

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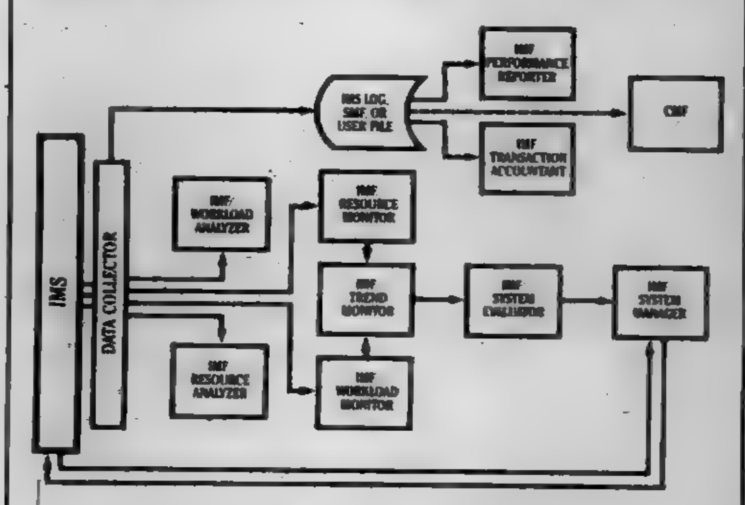

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IBM Program Restrictions Earn Mixed Reviews

(Continued from Page 65)

nouncement is impossible to gauge now, for systems and applications houses alike. Thus, some vendors are holding their breath in anticipation of the program access limitations, while others are clearly losing little sleep.

The announcement states that "for selected new IBM-licensed programs and selected new versions and releases of currently available programs, certain licensed program materials may be either made available on a restricted basis or not available."

The list of possibly restricted materials includes machine-readable source code, microfiche, logic manuals and selected basic materials, IBM said. Further, IBM will review licensed materials on an individual basis to determine what program materials will be distributed.

Restricted Materials

Henceforth, IBM will allow its customers to use restricted materials only "to interface user programs or products, to make user modifications or to perform problem determination, problem source identification and problem resolution activities."

In addition, IBM will prohibit reverse compilation or the running of object code through a compiler to produce source code.

The new terms are effective Sept. 1 for all current customers of IBM-licensed programs. For those requiring licenses with restricted materials prior to this date, the new terms will become effective when the programs are ordered.

Without being specific on what restrictions will apply to which programs, IBM announced that the following programs will contain "some" restricted program materials: MVS/SP JES 2 Version 2; MVS/SP JES 3 Version 2; Data Facility Product; TSO Extensions; RMF Version 3.1; Assembler H Version 2; Systems Modifications Program Extended; MVS/SP JES2 1.3.3; MVS/SP JES3 1.3.3; and VM/XA Migration Aid.

Industry Viability

Digesting the meaning of IBM's announcement, Martin Sprinzen of Candle Corp. said, "IBM officials have said that they are concerned with preserving the viability of the software industry, and, therefore, we have no reason to be concerned with these announcements."

Vince Rauzino, a consultant with Data Decisions, Inc., was considerably more concerned.

"By not providing the source code or by making it available on a very restricted basis, what they do is cut out the ability for anyone to do anything compatible," he said. "It is very, very difficult to reconstruct the source code."

For users, Rauzino said the implications of IBM's actions may be negligible at first, as they can still obtain licensed software without any problems.

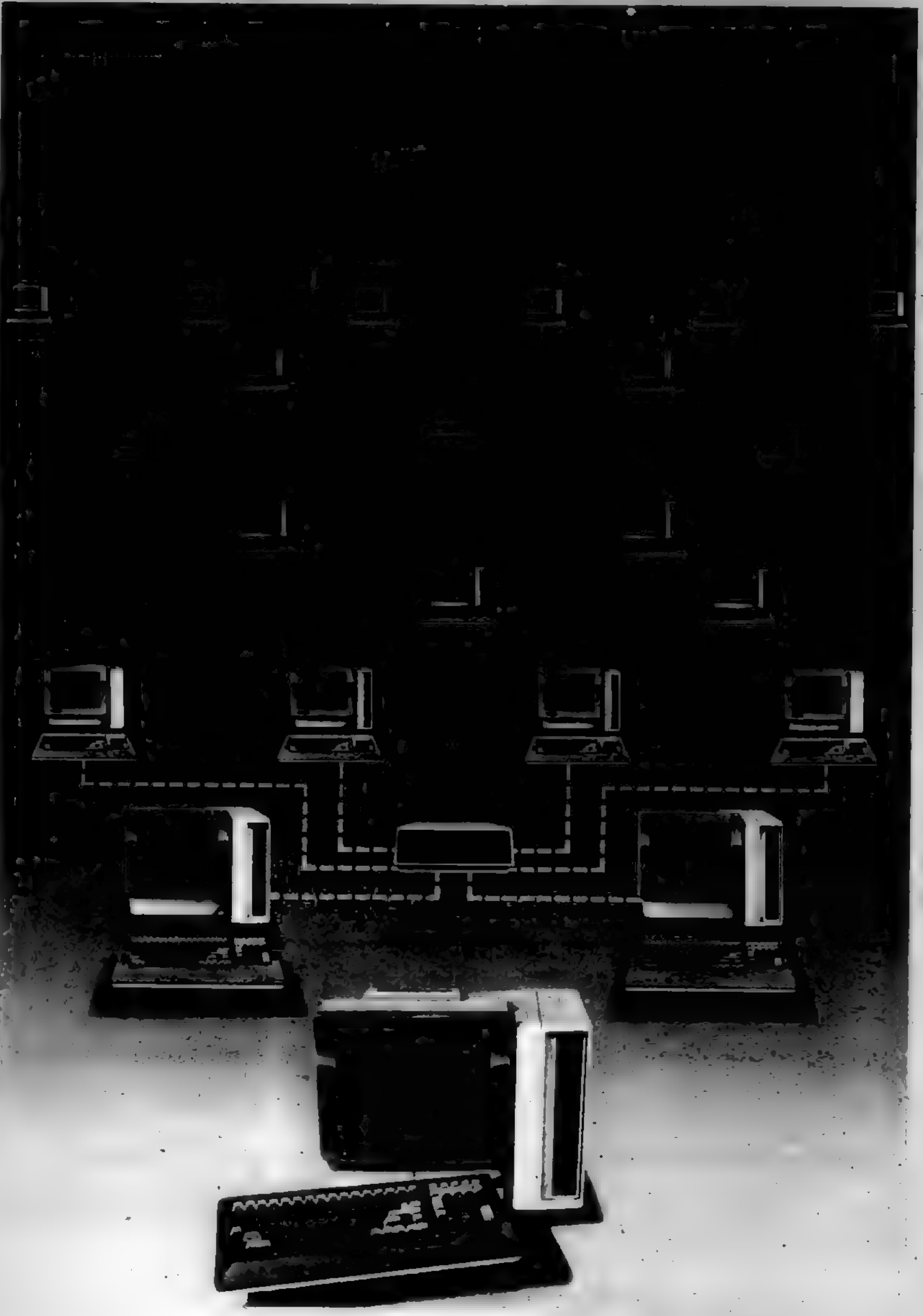
Rauzino tied IBM's latest moves into what he termed an overall strategy to develop greater market penetration in order to achieve "15% or 16% growth throughout the '80s."

Jack van Kinsbergen, president of Boole & Babbage Inc., said, "I don't have any big problem with it, because I have never had any difficulty getting what I needed from IBM. I don't think they're going to do anything arbitrary that will cause us any major difficulty."

Asked how the announcement might affect users, van Kinsbergen said, "They need it because it is the most effective documentation."

Martin Goetz, vice-president of software products at Applied Data Research, Inc., said the announcements "could have a very strong negative effect" on some software companies, particularly systems software houses.

"These vendors really have to know how a product works internally . . . The fact that they will not give out source code or logic manuals or give it out selectively strikes me as potentially very dangerous," according to Goetz. "I don't like it," he said.



Executive Corner

• **David J. Collard** has been promoted to vice-president of finance, administration and planning and chief financial officer at Prime Computer, Inc.

• **John J. Clancy** has been appointed senior vice-president, industry and production management, and **Charles M. Barlow** has been appointed senior vice-president of Health Services Division for McDonnell Douglas Automation Co.

• **Larry Jordan** has been promoted to vice-president of marketing at SEEQ Technology, Inc.

• **Larry D. Owens** has joined Cado Systems Corp. as senior vice-president of systems.

• **William Lattin**, a vice-president at Intel Corp., has been named general manager of the firm's Systems Group.

• **Edward A. Grant** has been appointed vice-president of administration and human resources at Decision Data Computer Corp.

• **Harold Koplow**, formerly of Wang Laboratories, Inc., has joined Modular Computer Systems, Inc. as vice-president of research and development.

• **Joseph C. Ciasullo** has been elected executive vice-president, international operations, and **Gary L. Asbell** has been promoted to vice-president and principal engineer at Datapoint Corp.

• **William Perry** has been promoted to vice-president and chief financial officer of Precision Visuals, Inc.

• **Peter Vostas** has been appointed vice-president, international marketing, and **John Mullaney** has been appointed vice-president of U.S. sales for Paradyne Corp.

• **James R. Krehbiel** has been elected vice-president of semiconductor operations, Semiconductor Division, for Intersil, Inc., and **Dr. Christopher K. Layton** has been elected vice-president of operations at the firm's Triangle Park facility.

• **Guy Daniello** has been elected president and chief executive officer of Datamedia Corp.

• **Thomas L. Hewitt** has been appointed vice-president, program development, of Computer Sciences Corp.'s Systems Group. **Richard B. Terhorst** has succeeded him as president of the Infonet Group's Government Systems Division.

• **Martin J. Chizzick** has been appointed corporate vice-president of international relations at Storage Technology Corp.

• **Alex Saunders** has been named vice-president and general manager of operations and **Dr. Mel Drossman**, vice-president, engineering and development, at Applied Digital Data Systems, Inc., a subsidiary of NCR Corp.

• **Peter Sulick** has been appointed vice-president and chief financial officer at Lifeboat Associates, Inc.

• **Jeffrey L. Zickler** has been promoted to vice-president, marketing operations, at MAI Applications Software Corp.

• **William Catania** has been appointed vice-president, customer service, at Decision Data Computer Corp.

• **Peter Cope** has been promoted to vice-president, European operations, for Allied Information Systems Co.

• **Robert C. McClelland** has been appointed vice-president of finance at Precision Monolithics, Inc.

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World DP Markets Seen Spiraling Toward PTTs

By Jake Kirchner
CW Washington Bureau

One underappreciated but important factor in the evolution of world DP markets, according to industry theorist Charles P. Lecht, is that many foreign industrial nations have postal and telecommunications agencies (PTTs). He predicted "with complete solidity, without qualification, that the computer businesses in all of the foreign countries ultimately [will] go under the control of the PTTs of those countries."

That, he said, is "another reason why it is bad to inhibit [foreign computer] manufacture and sale in the United States, because it will accelerate [putting foreign markets] under the PTT umbrellas of West Germany and France and England.

"And when it does [occur] we won't be competing any longer with [Siemens AG, ICL Ltd. or Olivetti Co.]; we're going to be competing with the local PTTs, [which will be] distributing data processing like telephone services. That's all right; we could sell into the PTT networks, but if we want to sell into the PTT networks we want to be friendly with the governments that own them, because they're all government controlled.

"So if we erect trade barriers ... we'll be selling into these networks that are not of our design. Whereas if we would be a little kinder to foreign competition, the networks would be our design because they'd be using all of our technology. My theory is that it's easier to sell to a country where all the products have been designed in our country, notwithstanding their competition, than it is to sell into a country where the products aren't of your design, because then you have to go through what we claim the Japanese and others go through here — namely, finding out what the hell [the designs] are."

When asked if the seemingly intractable trade problems between the U.S. and Japan do not call for some sort of U.S. trade action, Lecht replied: "I don't want to appear anti-American ... [but] I believe that ultimately our best interests are served with friendship with Japan, and if the Japanese can produce what we can produce for 50% the cost, we ought to buy it and make something else ... except for strategic materials." He added that "it is my theory that if Japan were allowed to sell computer systems into America the price would drop maybe 25% to 50% of these systems we have now."

As far as computer users are concerned, Lecht predicted U.S. trade restrictions would mean higher costs. Ultimately, he said, "we have to balance the good of our computer industry with the good of the user community, and it seems to be a bottom-line statement that the user community benefits by free trade; the manufacturing community benefits by lack of it."

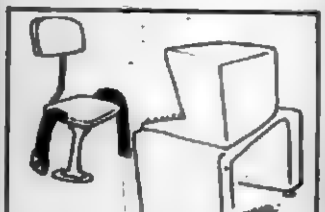
Futurist Fears Trade Wars

(Continued from Page 73)

to see a declining [world market] share. You may notice from statistics that have been around for the last couple of years that the American percentage of the foreign marketplace is dropping rapidly, but the American percentage of IBM or IBM-compatible products is increasing rapidly.

"This suggests that we're going to see a [market share] diminution abroad and the diminution is going to occur in the area of our greatest strength as a country — namely, IBM systems. And other people's systems which were, heretofore, incompatible can be run by brute force, Mips wastage in the mainframe of a foreign architecture."

Lecht said he has argued this point with government officials, telling them "if you put up trade tariffs which are prohibitive and you force these people into their own architectures, don't kid yourself." But, he said, U.S. trade officials "don't understand the computer business. They just understand moving cars." Rash trade actions on their part will only exacerbate the problems of U.S. firms trying to market abroad, he said.



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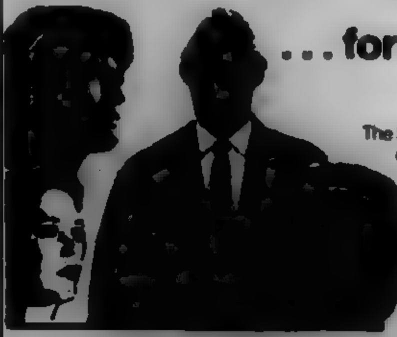

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St. Agnes Hospital is expanding its computer information system and is seeking an experienced individual who can assume project control and technical direction responsibility for a staff of 6 programmer/analysts.

On-line healthcare and financial applications are being developed using a combination of the IBM Patient Care System and specialized packages from other vendors. Computer environment is IBM 4341 DOS/VSE-VM/CMS using CICS and DL/1.

This position offers highly competitive salary and excellent benefits. Our setting overlooking the city of Baltimore offers easy access to the Baltimore - Washington, DC metropolitan area.

For further information call or write:

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900 Caton Ave
Baltimore, Maryland 21229
(301)368-6352

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COMPUTOOL CORPORATION
5600 Lincoln Drive
Minneapolis, MN 55436

BENCHMARK CONSULTANT

Manufacturer of large-scale computers is seeking a benchmark consultant to support field marketing personnel and software systems used by CYBER 200 benchmark labs. Position also includes research of operating software facilities to support use of vector processing and virtual memory techniques.

Masters degree and a minimum of five years of experience with large, scientific computers including the CYBER 205, 170, 6000 series systems are required. Knowledge of optimization techniques for vector processing and of high performance, inter-mainframe local networking techniques is needed.

Experience in a marketing support environment including technical presentations and reports is also required. Job involves 10% travel and flexible working schedule with evening and weekend hours. Salary level is $3850.00/month.

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Nancy Thompson/MDES 3-17
309 Second Ave. South
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Management Information Services

Due to expansion, one of the Southwest's leading medical centers is currently seeking qualified applicants for the following positions:

- **LEAD PROGRAMMER/ANALYST**
  Minimum five years experience
- **SENIOR PROGRAMMER/ANALYST**
  Minimum three years experience
- **COMPUTER PROGRAMMER**
  Minimum one year experience

Candidates should have knowledge in VRX operating system, V8585MP utilizing VRX COBOL and CAM file structures.

These positions offer an excellent benefit package. Compensation commensurate with experience. Interested candidates meeting qualifications should send resume to:

Providence Memorial Hospital
Personnel Department
2001 North Oregon
El Paso, TX 79902
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Call on Fortune 1500 National Accounts, OEM customers or educational institutions. Minimum 4 years major account sales experience in the computer industry required. Also seeking experienced sales managers.

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Provide direct support to field sales personnel, assist with sales development, make sales calls, identify and solve technical problems. Requires advanced knowledge of DP technology and applications, programming methods and system design, and a working knowledge of data communications and system architecture. Minimum 3 years similar experience with a major computer vendor required.

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Based in Cupertino, CA

Drive sales programs on a team basis, working with RSM's, OEM salespersons, and Rep firms. Handle leadership role in some contract negotiations. Introduce and integrate new sales programs. 5-8 years OEM sales and sales management experience in the computer industry. BSEE/CS or equivalent. MBA preferred.

Join our adventure now! Send your resume to E. Curran, Apple Computer Inc., MS 16-B, Dept. CW, 20525 Mariani Avenue, Cupertino, California 95014.

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OXFORD Software, one of the international leaders in IBM-compatible on-line application development software, is seeking a Product Manager to handle one of our newly-created software products.

The individual we seek should have a working knowledge of IBM mainframe computers, CICS, and COBOL. Prior experience in the areas of administration, marketing and customer support within the software industry desirable.

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USA TODAY

ANALYSTS/PROGRAMMERS PROJECT LEADERS FIELD SUPPORT

USA TODAY, the nations newspaper, has career opportunities for computer professionals interested in the start-up of a large IBM 4300 mainframe operation and a nationwide distributed DATAPOINT network.

IBM 4300 SYSTEMS

Candidates must have solid experience on IBM mainframe and a proven track record in developing interactive MIS applications. Experience with VM, CMS, COBOL and RAMIS is strongly preferred. Experience in managing project groups a strong plus.

DATAPOINT SYSTEMS

Analyst/Programmer: Requires solid experience in DATAPOINT systems utilizing DATABUS.

FIELD SUPPORT COORDINATORS: Support distributed nationwide network. Requires entry level experience in DATABUS. Some travel involved.

General responsibilities include: (1) indentification of business related problems and new applications for users, (2) recommending system and procedural solutions, (3) selling the solutions, and (4) follow-up design, development, and implementation. A degree in a business or computer related field is required.

Location of positions is in the nations capital, WASHINGTON, D.C. Salary is commensurate with experience. We offer top company benefits. Interested applicants should apply by submitting a resume and cover letter stating salary requirements to:

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- High performance Computer System architecture design.
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- Development of large disk interface.
- Selection and interface of peripheral devices.

TECHNICAL WRITERS

- Write service manuals for engineering computing systems and manuals to describe user interface.

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- **Marketing Manager**
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- **Product Marketing Manager**
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- Develop and integrate an advanced data base management system into a UNIX™ environment.
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- Evaluate, select and implement operating systems and language packages.

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- **Manager, Local Area Networking**
  Lead the Software Hardware development of local area networking subsystems.
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- **Manager, Application Software**
  Identify, assess and implement a set of general purpose engineering software applications within engineering computing environment.
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All openings require a technical degree and relevant experience. We can offer compensation that will reflect your education and experience. Subsequent advancement will be based on individual achievement. Benefits include profit sharing and relocation assistance to Portland, a liveable city with a mild, four season climate, abundant recreation and a suprisingly affordable cost of living.

For confidential consideration, please send your resume to Professional Staffing, Engineering Computing Systems, P.O. Box 1000, MS 63-658, Wilsonville, Oregon 97070, or call (collect) (503) 685-2524.

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We offer an excellent salary/benefits and opportunity for personal growth. For a confidential interview, call or send resume to:

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American Dade has an immediate opening for a Microcomputer Systems Programmer to assist in the support of Clinical Laboratory Microcomputer product lines. The ideal candidate will have extensive experience with Microcomputer hardware and software emphasizing Apple and IBM products using C/PM Basic. Excellent communications skills will be needed to interface with vendors and with all levels within the division in order to translate Marketing needs into Data Processing Systems.

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First National Bank In Albuquerque

First National Bank in Albuquerque, the largest independent bank in New Mexico, is in the process of building the best and most up to date processing department in the state. We have recently installed dual IBM 4341's running under VM, DOS/VSE to support a large on-line network, including teller terminals, administrative terminals and 24 hour APM's. All applications are in the process of being updated and most are being changed for on-line access and MVS operating systems.

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We currently have an excellent opportunity available for an EDP Auditor. Qualified applicants will possess the following background: BS in business with accounting minor, or BS in business with 1 year accounting experience. 2 to 5 years banking auditing experience, or 2-5 years financial applications programming/analyst/project leader experience with a working knowledge of systems development methodology required. A knowledge of IBM 370 environment under DOS/VSE necessary; knowledge of Easytrieve, COBOL and Assembler highly desirable. General banking knowledge and an ability to communicate clearly in oral and written form are essential.

SR. SYSTEMS PROGRAMMER

The Sr. Systems Programmer should have MBS Systems Programming experience and MVS systems programming experience.

PROGRAMMER ANALYST

The Programmer Analyst should have 3-5 years experience in Assembler, knowledge of MVS and COBOL helpful. Exposure to banking applications preferred.

First National Bank in Albuquerque offers an excellent compensation and benefits package. Qualified applicants may submit their confidential resume and salary history to:

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SYSTEMS PROGRAMMERS

- IBM 370, 30XX, 4341: solid background in internals of OS/MFT and OS/MVS. ALC skills essential and FORTRAN expertise very helpful.
- HONEYWELL 6000, 66, DPS-8: proven record in the internals of GCOS-III and/or GCOS-8, GMAP; also, GRTS-II internals and 355MAP.

APPLICATIONS PROGRAMMERS

- IBM 370, 30XX, 4341: COBOL programmer/analysts with experience in one or more of the following—CMS, TSO/ISPF, ADF, VSAM, Data Base Management Systems (IMS, M204, TOTAL).
- HONEYWELL 6000, 66, DPS-8: COBOL programmer/analysts with experience in one or more of the following—DM-IV/TP, IDS-I/II, TSS, TPE, TDS.
- VAX 11/780 and 4-PHASE: programmer/analysts with UNIX operating system experience, VISION and/or FOREWORD.
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Colby College invites applicants for the position of Coordinator of Academic Computing. The successful applicant will be responsible for providing technical support and assistance to faculty members in seeking, obtaining, installing, and documenting software and datasets which are appropriate for integration into existing courses. In addition, the Coordinator of Academic Computing will offer workshops or seminars on the use of the various computing facilities at Colby College and tutorials to students and faculty on introductory concepts required for specific uses of the computer. This individual will report to the Director of the Colby College Computer Center and will have faculty status. Applicants should have considerable experience with user support in an academic setting, a wide knowledge of datasets and software available for academic use, and detailed familiarity with UNIX and several programming languages including PASCAL and FORTRAN, and preferably C and BASIC. It is hoped that the Coordinator of Academic Computing will have experience and continued interest in research and teaching in one of the traditional academic disciplines. Applications, including at least three letters of recommendation, should be sent to:

Professor L. Sandy Maisel, Chair
Academic Computing
Search Committee
Colby College
Waterville, Maine, 04901
before March 31, 1983

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San Francisco Community College District

Application Deadline, Wednesday, March 16, 1983
Salary Range, $35,988 - $39,156

Plans, organizes, supervises, evaluates, and assists with budgeting and instructional development for all academic computing services and operations.

Qualifications include an earned master's degree or higher with significant emphasis on computer-related training, and three years of full-time experience working in academic computing.

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Reginald Y. Alexander
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San Francisco Community College District
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DATA PROCESSING

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The Information management department located in Columbia, South Carolina, has an immediate need for a Systems Programmer in a teleprocessing environment. We are a well established multi-million dollar agricultural, financial institution serving 4 states.

We're seeking a qualified Systems Programmer who is interested in a professional environment which encourages personal responsibility with minimum supervision. Qualified applicants will enjoy a challenging atmosphere where advancement is based on results.

Successful candidate must have 2 years experience in Systems Programming with background in DOS/VSE, CICS, ALC, BTAM. Primarily responsible for CICS and other Data Communications Software. Secondarily responsible for Total Data Base and Data Base Administration.

We offer a competitive salary commensurate with experience, relocations assistance, and an extensive benefit package. For immediate consideration, please forward your resume and salary history in complete confidence to:

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MVS SYSTEMS PROGRAMMER

Cedars-Sinai Medical Center, the West's premiere medical center, seeks an experienced MVS Systems Programmer with in-depth knowledge of MVS/SP, JES2, CICS, ACF/VTAM/NCP, SMP4 and RACF. Must be capable of installation, tuning, and maintenance of MVS/SP and system components. Experience with operating system conversions and capacity analysis a definite plus. Salary is in the low to mid 40's, and supported by a superior benefits package including three weeks vacation the first year. Submit resume to:

Mr. John Gilbert, Employment
C S M C
8723 Alden Dr.
Los Angeles, Calif. 90048
(213) 855-5529

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The Computer Information Systems Department welcomes applications for a faculty position available September 6, 1983. A Bachelors degree required, Masters preferred. Minimum of three years business data processing experience required. Requires strong interest in undergraduate instruction and ability to teach courses in several of the following areas: Systems Analysis, Programming Languages, Teleprocessing and Data Base Management.

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Forward resume with employment experience and salary history to: (no agents)

Dave Wilson, Manager
Advanced System Department

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EOE M/F/V/H

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Position location: Lexington, Massachusetts (a northern suburb of Boston).

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Kashmira Patel
Teleprocessing Search
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Requirements:

- Two years FORTRAN experience.
- Minimum of one year experience with PRIME, Perkin-Elmer or PDP-11.
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All positions require a Bachelors degree in Computer Science or a related field; equivalent experience with systems architecture or data base management systems will be considered.

We offer an excellent salary plus a comprehensive company-paid benefits package. For consideration, send resume including salary history to:

R.J. Pearce, Employment Manager

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SOFTWARE ENGINEERS

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Requirements: BS/MS Computer Science or Engineering; 5–7 years' experience in computer-based analysis and programming tasks in scientific and real-time areas. Supervisory and/or program development Software Technology experience desirable.

Responsibility: Development of artificial intelligent/expert software systems as well as encouraging the technical growth and professional development of the programmers and analysts in the R&D Computer Applications group.

Software Engineer

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COMPUTER TECHNOLOGY INSTRUCTOR

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Duties: Instruct courses such as Intro to C.T., Computer Operations, Micro Computers, BASIC, FORTRAN, COBOL, etc.

Salary: $21,[illegible] - $32,281 for 10½ mos. dep. on education & exp.

Starting date: August 15, 1983

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ENDOWED PROFESSORSHIP IN INFORMATION/COMPUTER SCIENCE

Claremont McKenna College (one of the Claremont Colleges) invites applications for the recently established W.M. Keck Foundation Professorship to provide leadership in a program in information systems and computer science. Applicants should have a Ph.D. in a computer related field such as management information systems, applied mathematics, or computer science, a strong commitment to undergraduate teaching, an established scholarly record, and practical experience with computer applications. Expertise in areas such as information sciences, systems design, simulation and modeling, operations research, data-base management, or numerical analysis would be especially appropriate.

Resumes and supporting letters should be sent to: **Professor Laurence D. Hoffmann, Chair, W.M. Keck Professorship Search Committee, Claremont McKenna College, Pitzer Hall, Claremont, CA 91711.**

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THE PENNSYLVANIA STATE UNIVERSITY

Continuing faculty positions in computer science at a number of The Pennsylvania State University's branch (2-year) campuses beginning August 22, 1983. Candidates should be genuinely interested in teaching lower-division baccalaureate and service courses. COBOL-oriented courses add considerable spice to the teaching diets at several of these campuses at which an associate degree is offered. M.S. in computer science is required; completion (or near completion) of Ph.D. is highly desirable; demonstrated desire for continued scholarly growth weighed heavily. Please indicate specifically if interested in an assignment involving associate degree program. A letter of application with resume and names of three people who may be contacted as references should be sent to Dr. Fred L. Sterly, **Computer Science Department, Box 202AA Whitmore Lab, University Park, PA 16802.** Deadline is March 31, 1983. AN EQUAL OPPORTUNITY/AFFIRMATIVE ACTION EMPLOYER.

ASSISTANT PROFESSOR DATA PROCESSING

Master's in Mathematics, Data Processing or related area strongly preferred. Strong background in at least 3 high level languages and in Assembler (IBM or VAX) required. Teaching experience, familiarity with display graphics and numerical analysis desired. Salary commensurate with teaching experience and ability, up to $24,000.

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FACULTY POSITION COMPUTER SCIENCE DEPARTMENT

Full-time faculty position starting September, 1983, or January, 1984. Teaching graduates and undergraduates in Systems Programming, Systems Analysis, Data Structures, or combination. Preference given Ph.D. in Computer Science or related area with industrial experience. Rank, salary dependent on qualifications. **Send inquiries, vita (include three references) by April 1, 1983, to Dr. Duane [illegible], Computer Science Department, Mankato State University, P.O. Box 14, Mankato, MN 56001.**

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Dr. William Duff
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Deadline March 15, 1983.

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Assistant Director
Employee Resources Management
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UNIVERSITY OF PITTSBURGH AT JOHNSTOWN

Department of Computer Science

The University of Pittsburgh at Johnstown, a four-year, degree granting college in the University of Pittsburgh System of Higher Education, has an opening in its growing Computer Science department at the level of Instructor or Assistant Professor.

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Candidates should be competent in PASCAL and FORTRAN, and should be willing and able eventually to teach other languages such as assembly or BASIC as needs arise. Candidates with teaching experience are preferred, but others such as recent graduates or those with meaningful job-related experience in computing are welcome to apply.

Hardware support at UPJ is given by the university's computer center in Pittsburgh with a DECsystem-10 in both timesharing and RJE environments. Several micros, display graphics equipment (high resolution video and hard copy), and a PDP-11 are also available for coursework, projects and faculty research.

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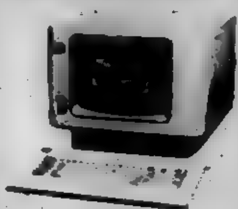

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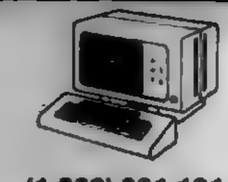

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William J. Mills, Manager Classified Advertising

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
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* * * * DEC * * * *

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11/23 11/34A 11/44 11/45 11/70 11/750

— DISCS —

RK05 RL01 RL02 RM02 RM03
RP04 RP05 RP06 RK06 RK07

— TAPES —

TM11EA TE16 TWE16 TJU45 TU45

— MEMORY —

11/34	11/44	11/45	11/70	VAX
MS11JP	MS11MB	MM11UP	MJ11BE	MS750
MS11LB		MF11UP	MK11BE	MS780
MS11LD			MK11CE	

— MISC. —

FP11A FP11B FP11C FP11E FP780
DMC11AL DMC11AR DMC11MD DMC11DA DMR11
DJ11AA DJ11AC DH11AA DH11AD DQ11
DV11 DZ11 DU11 DL11 DR11
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The Qume 9/45 offers you:

- **letter-quality printing for word processing applications**
- **45 cps print speed**
- **automatic proportional spacing, switch selectable**
- **snap-in, high capacity ribbon**
- **ultra-high reliability**
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These units are all new, in cartons, and come complete with our full 30-day warranty for parts and labor.

EIA RS-232-C cable, ribbon, and printwheel all included for the $1,099 price.

Call today
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S/32 S/34 S/38

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VS: 2280V-1,2,3; 2265V-1,2,3
OIS: 6580-1,2,3; 6565

Data Products Printers
MVP, LVP, LVPC: 2273-1, 2273-2

ERST International (212) 431-1100

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DEC

TERMINALS - PRINTERS - PERIPHERALS
ACCESSORIES - SUPPLIES

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****THIS MONTH'S SPECIALS****

RK07-PA 28MB Drive	$5300
VT100-AA w/VT18X comp. opt. & CP/M, Multiplan, Select, Microsoft Basic	$2800
Without terminal	$1300
(2) RM03-AA New 67MB Drive	$11,500
(6) RK05J-AA Used	$800
(1) TWE16-AA New 9 TR Tape Drive	$16,300
(1) DS15-AA Unused System	$7,500
VT102-AA	$1325
LA120-RA	$1700
VT101-AA	$875

Quantity Pricing is Available

CALL NOW (603)893-4700

AUCTIONS

PUBLIC AUCTION

The Budd Leasing Corporation will sell the following described equipment at public auction on the 14th day of March, 1983 at 10 AM at 1575 Universal Ave., Suite 258, Kansas City, MO 64120:

(1) 610E Basic Four Data Processing System consisting of 1321 CCA with CPU
1309 memory 128KB
2530 Disk Drive 35MB
2950 Disk Pack with S-280 O/S
7250 VDT with 25 inch cable
Additional Equipment and Features;
(1) 3561 Printer 300LPM
(1) 2530 Disk Drive 35MB
(1) S-280 Operating System
(3) 7250 VDT with Printer Port and Desk Worktable
(3) 2935 Disk Packs
(1) 2950 Disk Pack
(2) 7270 Video Display Terminals with Printer Ports
(1) S-272 Easy II Software Report Writer
(1) 9152 System 610 CPU Upgrade

All equipment is to be sold as is, where is, there are no warranties, expressed or implied or otherwise except the warranty of title. THE BUDD LEASING CORPORATION reserves the right to bid at the sale. Deposit of 25% required at the time of sale, the balance due and removal of equipment in 5 days. All payments are to be by cash or cashiers check. Equipment will be available for inspection prior to sale at 1575 Universal Ave., Suite 258, Kansas City, MO.

The Budd Leasing Corp.
3003 N. Central Ave.
Suite 1214
Phoenix, AZ 85012

BIDS & PROPOSALS

MISSISSIPPI CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by the CDPA, 508 Robert E. Lee Building, Jackson, MS 39201 for the following data processing equipment and services:

Request for Proposal Number 822, due Tuesday, March 29, 1983, 3:30 P.M., for the purchase or lease-purchase of a batch oriented package to run on an Amdahl V6/V8 environment running under MVS to help the State Board of Health, Home Health Services Section in its programmatic and fiscal accounting functions.

Request for Proposal Number 823, due Thursday, March 31, 1983, 3:30 P.M., for the acquisition of a distributed processing system running MVS as a remote system communicating with the State Computer Center.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

Becky Adams or Elaine Krause,
State Central Data Processing Authority
601/359-1395

MONTANA POWER COMPANY
REQUEST FOR PROPOSAL

Vendors interested in responding to a forthcoming request for proposal for an IBM-based Customer Information System or Customer Accounting System at a major electric/gas utility are asked to contact:

Mr. Daniel F. Daly
MONTANA POWER COMPANY
40 East Broadway
Butte, Montana 59701
(406)723-5421 ext. 2868

SEALED BID SALE

Public Service
Electric and Gas Company
Computer Hardware

All sealed bids must be received by 12 noon on Friday, March 18, 1983. PSE&G reserves the right to reject any or all bids. Sale is subject to approval by the New Jersey Board of Public Utility Commissioners.

Equipment: (6) IBM Type 3330, Model 011 Disk Storage Units.

(4) IBM Type 3333, Model 011 Disk Storage and Controller Units.

Arrangements for the inspection and additional information can be made by contacting Mr. Russell A. Bailey at (201) 430-6832.

All bids shall be in the office of Mr. John G. Gill, General Manager, Purchasing, Mail Code 8Z, P.O. Box 570, Newark, NJ 07101, No later than 12 noon on Friday, March 18, 1983.

The Bulletin Board

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T I

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(2) VDT Graphics Kit
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TPL Forms & Procedures
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(201) 467-5000
51 JFK Pkwy Short Hills, NJ 07078

DEC

FOR SALE

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RM05	256 Mb Disc
RP07	512 Mb Disc
LP-11-DA 132 columns	6601 lpm printer,
10 LA180	Printing Terminals

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KW11-P	$ 250	RM03-C	$1495
LP11-RA	$6950	RM80-C	$1495

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- (2) Disk packs for RP06 disk drive.

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11/44 KE44-A 'CIS'	$2,975
11/70 1/2MB, MK11-CE	$2,990
11/44 256KB, MS11MB	$1,275
11/34 256KB, MS11LD	$1,225
DZ11 MUX Brd.	$1,125
FP11A Fltng pt.	$1,075
CALL RAY	(617)872-0000

DEC

DEC CLEARANCE

(5) RK07-PA (NEW)	$7,495
(1) RM02-AA (NEW)	$13,995
(3) 11/34A (NEW	$4,995
(5) MS11LD (NEW)	$1,295
(2) RH11 (NEW)	$3,895
(4) TU58-DA (NEW)	$895
DataStar, Inc.	(714)000-7000

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DEC Professional 300 Series complete w/W.P., O/A software Inquire Price
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(2) MS730-CA 1MB Mos/ECC	$5,500
(2) MS750-CA 1MB Mos/ECC	$5,500
(3) RL11 RL01/02 cntlr	$1,400
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(1) 3780 Comm. Adapter
Under Univac Maintenance
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Mem. Ctrl. w/256KB	7,000	3,000
Mem. Ctrl. w/64KB	4,700	1,500
Multiple Device Cntlr	1,600	700
Console Device Pac	315	250
600 LPM U/L Case Ptr	24,000	10,000
Printer Device Pac	550	400
256MB MSU w/Cntrl	36,800	24,000
256MB MSU w/o Cntrl	33,000	21,000
MLCP w/8 Curr. Ports	6,000	3,800
MLCP w/8 Mic. Ports	6000	3,900
4-Slot Exp.	5,000	2,700
9-Slot Exp. Chassis	9,000	5,500
256 MB Disk Pack	$1,150	$500

RNR & Hubang
(714) 549-0000

DATA GENERAL

DG 6026 S/S NEW	$12,750
1144-B NEW (2-Bay)	$1,400
DG 73MB S/S NEW	$13,500
Nova 4S 64KB M/D, B/B NEW	$5,500
Nova 4C RTC 64KB NEW	$2,550
6021 New	$5,500
ULM-5 ALL MODELS	CALL
6070 S/S, A/O	From $4,000

CALL FOR UNLISTED EQUIPMENT
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C350 w/0KB	$19,000
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8367 256KB 4X mem.	$3200
6021 800BPI Tape S/S	$4500
6053 D-2 CRT	$1195
6108 D-200 (New) CRT	$1500
6052 D-1 CRT	$900
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(4) LDM-4 SS Arts limited Distance modem
GENERAL DATA PROCESSING, INC.
Contact Sales (713)623-6464

THE BULLETIN BOARD

It's a classified section in Computerworld designed especially for the selling and buying of individual pieces of hardware in a convenient, low-cost format. It is especially suited to companies that have a piece of used equipment they want to sell. For one low price, you can inform more than half a million Computerworld readers around the country of your equipment's availablility.

How Does The Bulletin Board Work?

Bulletin Board ads come in standard units (one column wide by one inch deep) and standard typefaces. (Units may be combined to produce deeper ads, but one column is the maximum width and no units of less than one inch are available.) Ads are arranged under headings (such as "IBM", "DEC" or "Printers"). The headline of the ad is set in larger, bold type, and should contain the standard equipment identification. The body copy should describe the equipment very briefly and give the person to contact. This is all the information an interested buyer needs to follow up. No ad should have more than one piece of equipment or software.

Price for each standard unit is only $115.00 (One unit minimum and no fractional units available.) Anyone can place an ad, but no agency commissions are paid, no quantity discounts allowed, and no credit toward rate is given for contract advertisers who advertise in other sections of Computerworld. It's a simple and effective system for buying and selling hardware and software.

Ads are accepted in the mail, by phone or by telecopier. Ads can be accepted up until the Monday before issue (7 days in advance of issue date). You should write out your ad before submitting it. (The standard size will hold approximately 25 words of copy.)

Once you've written your ad, send it in with the coupon below or call one of our ad-takers. (If your company has never advertised with us before we request a check with your order.)

Remember that all ads are standard. No special typefaces, no borders and no logos are allowed. Ads are set on a six-column page in our classifed section under the heading "The Bulletin Board.". We assume no liability for errors beyond the price of the ad in the case of material errors.

ORDER FORM

Issue Date: Ads can be accepted up until the Monday preceding the issue desired. Computerworld comes out every Monday.

Classifications: Most ads will be classified according to the brand of equipment that is being bought or sold. These classifications are: **Altos, Burroughs, Control Data, Data General, Digital/DEC, Hewlett Packard, Honeywell, IBM, NCR, Salvage, Sperry Univac, Teletype, Terminals, TI, WANG, Miscellaneous.**

Copy: Copy for your ad must be cleanly typewritten and may be sent in via the mail or by telecopier (telecopier extensions are 410 and 451). Ads may be given over the phone to our team of ad takers. The standard size is 1 column by 1 inch deep. These units may be combined to form larger sized ads. Describe the equipment very briefly, give the price and the name of the person to contact. All ads will be set up using a standard format. No borders or logos are allowed.

Cost: The price for each standard unit is $115.00 (One unit minimum and no fractional units allowed). There are no agency commissions and no quantity discounts.

Billing: Once you've written your ad, send (or call) it in with your name and address for billing purposes and we'll run it. (If your company has never advertised with us before, we request a check with your order.)

Issue Date(s): ______________________

Signature: ______________________

Name: ______________________

Company: ______________ **Title:** ______________

Address: ______________________

Telephone: ______________________

Send this form to:
COMPUTERWORLD BULLETIN BOARD
375 Cochituate Road, Box 880 Framingham, MA 01701
(800) 343-6474 (617) 879-0700

The Bulletin Board

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FOR SALE
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- Tape cassette
- 160 cps printer
- 1 7250 display terminal

Under Maintenance Contract
Available Immediately
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DP ASSOCIATES
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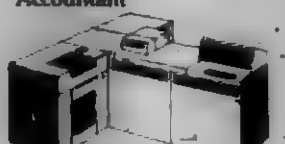

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ADVERTISERS INDEX

Alpha Micro	SR/26-SR/27
American Software	44
Anchor Pad International	ID/15
Apollo	34-35
Applied Computer Research	97
Applied Data Research	3
Applied Technology	44
Arthur Andersen & Company	SR/21
Auerbach Publishing	42
AZREX	SR/28
Az-Tek Computing	SR/10
John Beall Company	65
B.I. Moyle Associates	SR/20
BMC Software	37
Boole & Babbage	74-75
Bunker Ramo Corp.	ID/18
M. Bryce & Associates	15
CACI	SR/44-SR/45
Carleton Corp.	SR/47
CGA	70
Chubb Institute	70
CIE Systems	47
Cincom Systems	17,SR/29
C. Itoh	20
ComData	45
ComDesign	70
Compu-Share	SR/42
Computeristics	SR/30
Computer Associates	8
Computer Management Research	33
Computer Technology	ID/4
Computerworld Buyer's Guide	79
Computerworld China	SR/50
Computerworld on Communications	50
Computerworld International	72
Computerworld Japan	30
Computerworld Subscriptions	90
Computerworld Supplement	SR/56
Condor Computer Corp.	SR/6-SR/7
Conference Management Group	ID/10
Continental Resources	14
Cord Cable Co.	ID/11
Corodale	SR/3
CRWTH Computer Consultants	SR/14
CS Computer System	72
Cullinet	SR/36-SR/37
Cyborg Systems	SR/13
Cytrol	SR/50
DASD	SR/48
Data Design Associates	55
Datamation	SR/28
Data Processing Design	SR/8
Datasouth Computer Corp.	ID/9
Datastream	47
Deltak, Inc.	73
DigiSoft	SR/9
Digital Associates	ID/11
Digital Consulting Association	SR/48
Digital Equipment Corp. —Educational Services	12-13
Digital Equipment Corp. —NPM Peripherals	66
Digital Equipment Corp. —TPG	36
Dorlen Products	48
Duquesne Systems, Inc.	25
Eastman Kodak Co.	63
EEC Systems	78
EPS Inc.	SR/53
Foundation Computer	SR/40
Fusion Products	32
Gejac, Inc.	SR/28
Genesys Software	SR/39
Group Operations	ID/12
Hewlett Packard	10-11
Hogan Systems	SR/49
Human Designed Systems	21
IBM	ID/3,27
Independent Computer Systems	SR/66
Information Science Inc.	SR/4-SR/5
Innovation Data Processing	9
Interbusiness Corporation	38
International Computer Equipment	52
International Mobile Machinery	ID/3
International Turnkey Systems, Inc.	ID/16
ISSCO	SR/38
K.W. Controls	24
Lee Data Corp.	28
LeeMah	18
Levi, Ray & Shoup, Inc.	73
Local Data	38
Lotus Development Corp.	SR/35
Management Archetypes Corp.	46
Management Science America	SR/17
Martin Marietta	29
MCBA	SR/52
McCormack & Dodge	SR/18-SR/19,108
Memorex	ID/14
MicroAge	64
Microlink	18
Microterm	48
MTI Systems Corp.	46
NASTEC	ID/2
National Advanced Systems	ID/6-ID/7
National Computer Communications	7
National Semiconductor	60-61
NCR/OEM Marketing	52-53
Newman Computer	72
Okidata	62
Omni Office	80
Oxford Software	SR/31
Pansophic Systems	49
Parallax Systems, Inc.	SR/34
PC World	94
Phaser	SR/15
Phase Information Machines	46
Popcom	ID/13
Precision Visuals	SR/14
Prentice Hall, Inc.	38
Professional Computer Resources	SR/12
Programmatic Systems	62
Protocol Computers	ID/8
Racal Vadic	ID/16
Radio Shack	38
RAMTEK	SR/24-SR/25
Rand Information Systems, Inc.	SR/3
Robert Routman Associates	46
SAS Institute	SR/22-SR/23,SR/43
Saturn Systems	99
Siggraph '83	71
Signal Technology	57
Software AG	19
Software International	SR/33
Software Tools	38
Solutions, Inc.	38,ID/4
Southern Systems	ID/17
Syncd	66
Systems Strategies	78
Tandem Computers	40-41
T and B Computing	SR/28
Technology Transfer Institute	SR/58
Televideo Systems	32-33,76-77
Telex	60
Teltek	64
Term-tronics	18
Tone Software	SR/20
Transnet Corporation	87
Triangle Software	43
Tri-Data	36
Ultimate Corp.	96
Ungermann-Bass	ID/15
United Telecomm Computer Group	SR/54
Unitronix	51
Universal Software	80
VM Software	SR/41
Walker Interactive Products	SR/11
Wang	SR/16
Western Data Systems	ID/10
Wolfe Computer Services	37
Xerox Corp.	59

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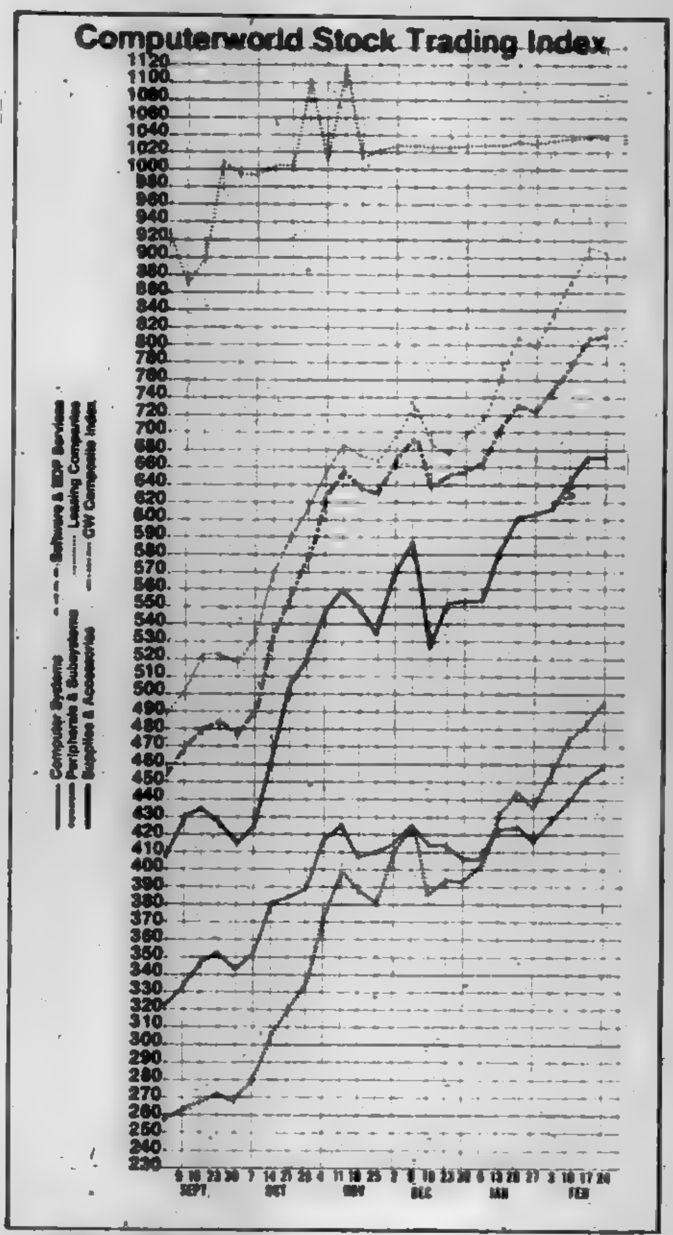
Computerworld Stock Trading Index



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Computerworld Stock Trading Summary

CLOSING PRICES TUESDAY, FEBRUARY 22, 1983

All statistics compiled
computed and formatted
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TRADE QUOTES INC
Cambridge Mass 02139

COMPUTER SYSTEMS

EXCH		PRICE 1982-83 RANGE (1)	CLOSE FEB 22 1983	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP	17- 44	40	- 5/8	-1.5
N	BURROUGHS CORP	28- 48	47	-1 1/2	-3.0
O	COMPUTER AUTOMATION	7- 17	14 3/8	-1 5/8	-10.1
N	CONTROL DATA CORP	21- 48	47 1/4	- 1/4	-0.5
N	CRAY RESEARCH INC	20- 48	44 3/8	-2 3/8	-5.0
N	DATA GENERAL CORP	20- 55	54 3/4	+ 7/8	+1.6
N	DATAPOINT CORP	11- 36	24	+ 1/2	+2.1
N	DIGITAL EQUIPMENT	62-128	124 1/2	+ 3/4	+0.6
A	EECO INC	6- 12	11 5/8	+ 1/4	+2.1
N	ELECTRONIC ASSOC.	5- 12	9 5/8	- 3/8	-3.7
N	FLOATING POINT SYST	16- 35	34 5/8	- 1/8	-0.3
N	FOXBORO	22- 42	41 3/8	- 1/2	-1.1
O	FULCRUM COMP GRP	1- 3	1/4	0	0.0
O	GENERAL AUTOMATION	3- 9	6 7/8	0	0.0
N	HARRIS CORP	20- 50	46 7/8	+2 1/8	+4.6
N	HEWLETT-PACKARD CO	38- 87	83 1/4	- 1/8	-0.1
N	HONEYWELL INC	60-104	82 3/8	-1 7/8	-1.8
N	IBM	57-100	97 1/8	-1 1/8	-1.2
O	IPL SYSTEMS INC	5- 11	10 3/4	+2 1/4	+26.4
O	MAGNUSON COMP SYSTS	2- 5	3 1/8	+ 1/8	+4.1
N	MANAGEMENT ASSIST	7- 18	17 1/8	+ 1/4	+1.4
O	MINI-COMPUTER SYST	1- 2	1/2	0	0.0
N	MODULAR COMPUTER SYS	8- 15	13 3/4	- 1/2	-3.5
N	MOHAWK DATA SCI	10- 18	16 5/8	- 3/8	-2.2
N	NCR	38-107	103 1/4	+1 1/4	+1.2
N	PERKIN-ELMER	17- 33	28 1/4	- 3/4	-2.5
N	PRIME COMPUTER INC	16- 45	42 3/4	-1 1/2	-3.3
N	SPERRY CORP	21- 38	35 5/8	-2 7/8	-7.4
O	TANDEM COMPUTERS INC	14- 34	28	- 3/4	-2.6
N	TEXAS INSTRUMENTS	71-176	161	-7 3/8	-4.3
A	WANG LABS "B"	13- 37	36 1/2	+ 1/8	+0.3
A	WANG LABS "C"	11- 37	36 1/8	- 1/8	-0.3

LEASING COMPANIES

EXCH		PRICE 1982-83 RANGE (1)	CLOSE FEB 22 1983	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE FINANCIAL CP	22- 30	28	+ 1/4	+0.8
N	COMDISCO INC	13- 48	46 1/2	+ 1/8	+0.3
B	COMMERCE GROUP CORP	1- 3	1/4	0	0.0
O	COMPUTER INVSTRS GRP	1- 2	3/8	0	0.0
O	CONTINENTAL INFO SYS	5- 21	19 3/4	- 1/4	-1.2
N	DPF INC	5- 12	12 3/8	+ 7/8	+7.6
O	ITEL	1- 3	5/8	- 1/8	-16.6
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	10- 41	28 1/2	- 5/8	-1.9

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON;
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
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SOFTWARE & EDP SERVICES

EXCH		PRICE 1982-83 RANGE (1)	CLOSE FEB 22 1983	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 4	3 3/4	- 1/4	-6.2
O	ADVANCED SYSTEMS INC	8- 24	23 3/4	+ 1/2	+2.1
O	AGS COMPUTERS INC	7- 22	18 1/4	- 1/4	-1.2
N	AMACOMP INC	8- 22	20 1/2	- 1/4	-1.2
O	ANALYSTS INTL CORP	5- 9	8 3/4	0	0.0
A	APPLIED DATA RES.	15- 49	42 1/4	- 1/4	-0.5
O	ASK COMPUTER SYSTEMS	12- 35	32 1/2	-1 5/8	-4.7
O	ASTRADYNE COMP IND	1- 5	4 5/8	+ 7/8	+23.3
N	AUTOMATIC DATA PROC	21- 38	35 3/4	- 1/4	-0.6
O	CGA COMPUTER ASSOC	5- 14	12 1/2	0	0.0
O	COMPUTER ASSOC INT'L	12- 48	45 1/4	+ 1/4	+0.5
O	COMPUTER HORIZONS	2- 12	11 3/4	+ 1/8	+1.0
O	COMPUTER NETWORK	4- 10	9 1/4	- 1/8	-1.3
N	COMPUTER SCIENCES	11- 23	20 3/4	- 3/4	-3.4
O	COMPUTER TASK GROUP	8- 18	15	-1	-6.2
O	COMPUTER USAGE	2- 18	15 1/4	0	0.0
O	COMPUTONE SYSTEMS	15- 38	33 1/2	-3 3/4	-10.0
O	CONSERV CORP	11- 20	17	- 3/4	-4.2
O	COMSHARE	6- 12	10 5/8	- 7/8	-7.6
N	CULLINET SOFTWARE	12- 35	30 3/4	-2	-6.1
O	CYCARE SYSTEMS INC	3- 18	15 7/8	0	0.0
O	DATA DIMENSIONS INC	1- 2	1/4	0	0.0
O	DATATAB	0- 2	3/4	- 1/8	-14.2
O	DYATRON CORP	2- 4	3 7/8	+ 3/8	+10.7
N	ELECTRONIC DATA SYST	15- 55	53 3/4	- 7/8	-1.6
N	INFORMATICS INC	10- 28	27 3/4	+ 1/2	+1.8
O	INSYTE CORP	1- 3	2	- 1/8	-5.8
O	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	4- 8	8	+ 1/4	+3.2
A	LOGICON	12- 34	31 7/8	+ 3/8	+1.1
O	MGMT SCI AMER INC	8- 28	29	- 1/2	-1.6
O	MATHEMATICA INC	12- 20	18 1/2	+1 1/2	+8.8
O	MATHEMATICAL APP GRP	12- 22	21 1/2	+2	+10.2
O	NATIONAL DATA CORP	5- 22	21 7/8	+ 1/8	+0.5
O	PANSOPHIC SYSTEMS	8- 25	25	+ 3/4	+3.0
N	PLANNING RESEARCH	6- 15	14 1/2	- 1/4	-1.6
O	PROGRAMMING & SYS	1- 4	3 5/8	0	0.0
O	REYNOLDS & REYNOLD	17- 30	30	- 1/4	-0.8
O	SEI CORP	21- 50	48 3/4	- 3/4	-1.5
O	SHARED MEDICAL SYST	13- 30	30 1/4	+1	+3.4
O	SCIENTIFIC COMPUTERS	6- 13	11 3/4	0	0.0
O	SOFTWARE AG	5- 17	10 7/8	- 1/4	-2.2
N	TYMSHARE INC	12- 30	21 3/8	-1 1/2	-6.4
A	URS CORP	5- 11	10 3/4	+ 5/8	+6.1
N	WYLY CORP	7- 13	9 1/4	- 3/8	-3.7

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1982-83 RANGE (1)	CLOSE FEB 22 1983	WEEK NET CHNGE	WEEK PCT CHNGE
P	AM INTERNATIONAL	2- 4	3 3/4	+ 1/4	+7.1
A	ANDERSON JACOBSON	9- 26	21 1/8	- 7/8	-4.1
O	AUTO-TROL TECHNOLOGY	6- 21	18 1/2	- 1/2	-2.6
O	BANCTEC INC	7- 33	17	- 3/4	-4.2
A	BEEHIVE INT'L	4- 10	8 1/4	- 1/2	-5.7
A	BOLT,BERANEK & NEW	13- 40	38	- 3/8	-0.9
O	CAMBEX CORP	2- 6	2 1/4	0	0.0
N	CENTRONICS DATA COMP	6- 18	17 5/8	+ 5/8	+3.6
A	CETEC CORP	4- 8	7 3/8	- 1/8	-1.6
O	COGNITRONICS	2- 12	8 3/4	+ 1/4	+2.8
O	COMPUTER COMMUN.	1- 2	1 3/8	+ 5/8	+83.3
A	COMPUTER CONSOLES	15- 44	40 1/2	+ 5/8	+1.5
O	COMPUTER DEVICES INC	4- 21	14 1/8	- 3/8	-2.5
O	COMPUTER TRANSCEIVER	4- 9	7 7/8	- 3/8	-4.5
N	COMPUTERVISION CORP	18- 45	42 3/8	+ 1/2	+1.1
N	CONRAC CORP	21- 38	34 3/4	-1 1/4	-3.4
A	DATA ACCESS SYSTEMS	1- 4	1 1/8	0	0.0
A	DATAPRODUCTS CORP	16- 41	38 5/8	- 3/4	-1.8
A	DATARAM CORP	5- 12	11 1/4	- 5/8	-5.2
O	DATUM INC	2- 10	8 3/4	- 3/8	-4.1
O	DAVID JAMISON CARLYL	2- 7	4 1/4	0	0.0
O	DECISION DATA COMPUT	3- 14	13 1/4	- 1/2	-3.6
O	DELTA DATA SYSTEMS	1- 4	3 1/2	+ 1/2	+16.6
N	ELECTRONIC M & M	5- 9	8 1/4	+1 3/8	+20.0
O	EVANS & SUTHERLAND	18- 50	44 1/2	-2 3/4	-5.8
O	GANDALF TECHNOLOGIES	10- 22	15 3/4	- 3/8	-2.3
N	GEN'L DATA COMM IND	6- 18	17 3/4	+1 1/4	+7.5
O	GENERAL TERMINAL CP	0- 2	5/8	0	0.0
O	GREAT SOUTHWEST IND	2- 8	2 1/2	0	0.0
N	HAZELTINE CORP	22- 58	52 7/8	+1 3/8	+2.6
O	ICOT CORP	3- 10	8 3/8	- 1/8	-2.8
O	INFORMATION INTL INC	10- 23	19 3/4	- 1/2	-2.4
O	INTEL CORP	21- 46	44 3/4	+ 1/4	+0.5
O	IPL SYSTEMS INC	5- 11	10 3/4	+2 1/4	+26.4
A	LUNDY ELECTRONICS	7- 16	15 1/4	+ 1/8	+0.8
A	MSI DATA CORP	14- 38	22 5/8	+2	+9.6
O	NETWORK SYSTEMS CORP	15- 43	42 5/8	0	0.0
O	OPEX	3- 5	3	0	0.0
N	PARADYNE CORP	24- 51	48 3/4	- 3/4	-1.4
A	PENRIL CORP	7- 12	10 3/8	- 1/4	-2.3
O	QANTEX CORP	12- 28	24 3/4	-1	-3.8
N	RECOGNITION EQUIP	4- 13	11 1/4	- 7/8	-7.2
O	SCAN DATA	1- 2	1 3/8	0	0.0
N	STORAGE TECHNOLOGY	18- 33	24	0	0.0
O	SYKES DATATRONICS	8- 27	14 5/8	-1 1/8	-7.1
A	T BAR INC	7- 14	13	- 1/8	-0.9
A	TEC INC	6- 12	9 1/4	+ 7/8	+10.4
N	TEKTRONIX INC	34- 73	72 1/2	+1 5/8	+2.2
N	TELEX	5- 27	25 1/8	- 1/8	-0.5
O	TESDATA SYSTEMS CP	3- 10	9 1/8	+ 1/2	+5.7
N	TIMEPLEX INC	7- 24	21	- 5/8	-2.8
O	VISUAL TECHNOLOGY	6- 18	18 1/2	+ 1/4	+1.3
B	WILTEK INC	1- 3	2 1/8	+ 1/8	+6.2

SUPPLIES & ACCESSORIES

EXCH		PRICE 1982-83 RANGE (1)	CLOSE FEB 22 1983	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN BUS PRODS	11- 21	20 1/2	0	0.0
O	BALTIMORE BUS FORMS	1- 2	1	- 1/4	-20.0
N	BARRY WRIGHT	13- 35	23 1/8	- 5/8	-2.6
O	CYBERMATICS INC	1- 1	1 1/4	+ 1/4	+25.0
A	DUPLEX PRODUCTS INC	12- 20	18 1/2	- 1/4	-1.3
N	ENNIS BUS. FORMS	18- 30	27 1/4	+ 1/4	+0.9
N	3M COMPANY	48- 80	75 3/4	-1 1/4	-1.6
N	MOORE CORP LTD	26- 46	44 1/4	-1 1/4	-2.7
N	NASHUA CORP	9- 19	11 1/8	+ 3/4	+7.2
O	STANDARD REGISTER	32- 80	78 1/2	+7 1/2	+10.6
A	TAB PRODUCTS CO	12- 34	31 7/8	0	0.0
N	WALLACE BUS FORMS	22- 50	49	+1 5/8	+3.8

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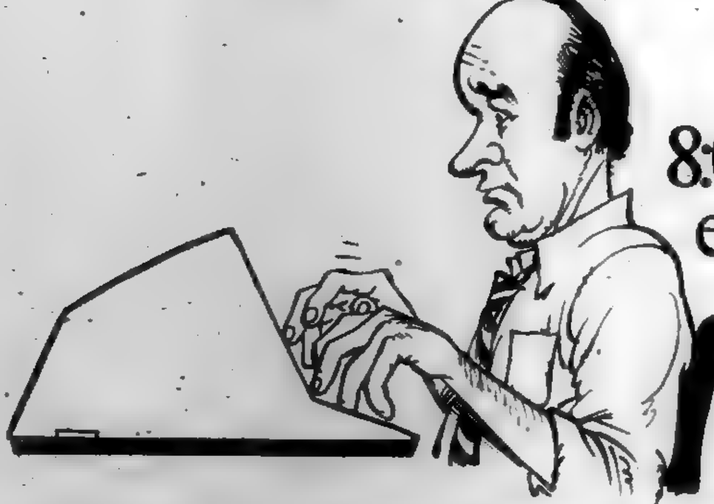
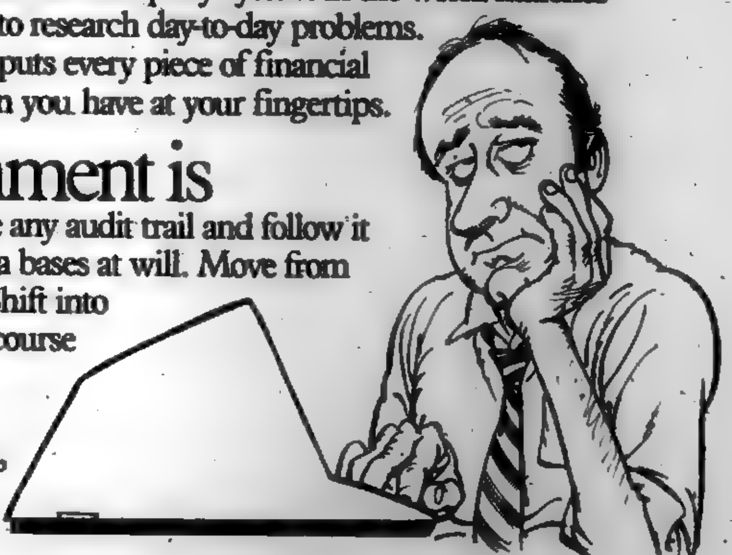


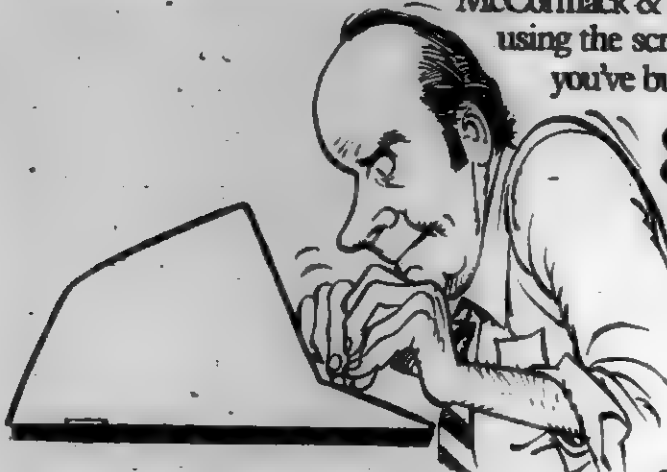
8:00 a.m. The boss says sales expenses are too high.

HiLite is a true accounting breakthrough. It lets you come up with answers in minutes instead of hours or days. No on-line query system in the world matches its ability to research day-to-day problems. It literally puts every piece of financial information you have at your fingertips.



8:02 a.m. Travel and entertainment is out of whack.

With HiLite, you can choose any audit trail and follow it to completion, criss-crossing data bases at will. Move from General Ledger to Accounts Payable to track sales expenses. Shift into Fixed Assets to pinpoint depreciation discrepancies. Change course 180 degrees and probe Personnel/Payroll for minority quota details. Search backwards and forwards through any and all McCormack & Dodge systems, using the screens that you've built.



8:04 a.m. Let's look at salesmen's expense reports.

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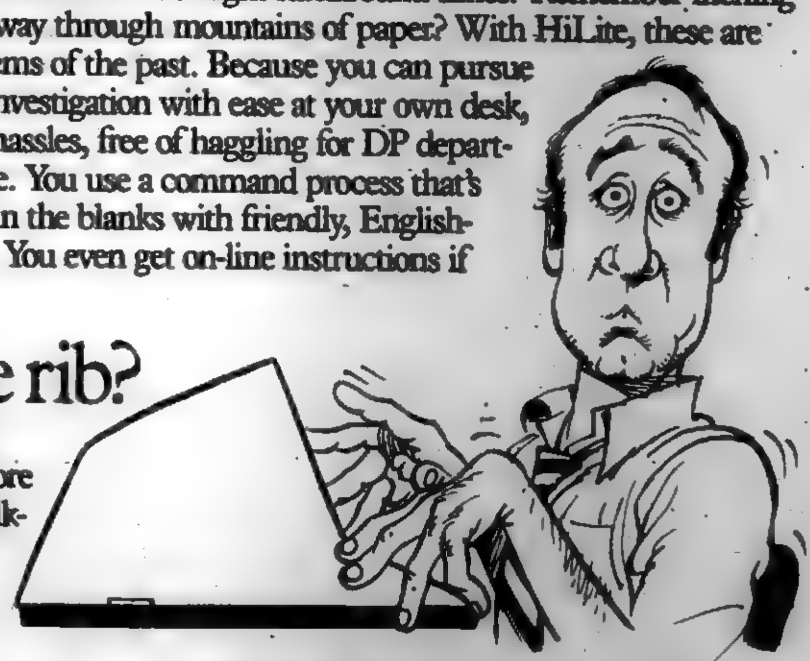

8:06 a.m. $1,000 for prime rib?

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/year March 7, 1983 Vol. XVII, No. 10

Maintains 'Bypass' Schemes feasible for Many Users

By Phil Hirsch
CW Washington Bureau

PARAMUS, N.J. — Despite all the talk about using microwave and cable TV channels to bypass telephone company local exchange networks, bypass solutions are unlikely to be feasible for many data communications users, maintains a study by Perspective Telecommunications Group, a consulting firm headquartered here.

One reason is that telephone-company-provided local loops are virtually ubiquitous, while the alternatives are not. In addition, "many of the prospective . . . providers of [bypass] solutions are not themselves equipped to provide the kind of support users have been receiving from the [telephone companies]," according to the study.

Moreover, bypass users — likely to be those users that need higher data rates than the telephone company can provide, have multiple locations within an urban area and employ more than about 100 people — will "have to help vendors provide a solution," a commitment that Perspective Telecommunications said many users will be unwilling to make.

The key point of the study is that although a number of bypass vendors will exist and although the potential market for their services will amount to about $2.3 billion annually, local telephone companies will continue to be the dominant providers of local exchange services, which Perspective Telecommunications dubbed intracity communications networks.

In 1982, out of total intracity communications network revenues of $18.5 billion, telephone companies garnered $16.9 billion; CATV operators pocketed most of the rest, according to the study. By 1985, the total intracity network

(Continued on Page 6)

Westinghouse Set to Transmit Via Cable TV

WASHINGTON, D.C. — Westinghouse Electric Corp. will use cable TV channels to transmit voice and data among three of its locations in downtown Pittsburgh, Pa., the company said last week.

The Westinghouse channels will go into regular service within the next two months, according to Tom Rush, vice-president of Warner-Amex Cable Communications, Inc., which will supply the transmission facilities. Warner-Amex is negotiating similar arrangements with several other large corporations in Pittsburgh and other cities, and "we hope to sign up three or four more customers within the next six months," he said.

Westinghouse's decision to use cable TV comes at a time when most of the nation's bigger tele-

(Continued on Page 6)

Users to Pay More To Local Phone Firms

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Telecommunications users will pay their local telephone companies more beginning Jan. 1 to handle Message Toll Service and Wats calls. That is the main thrust of an access charge reimbursement plan released here last week by the Federal Communications Commission.

Access charges are now collected from interstate carriers, who pass them on to their customers. Under the new scheme, end users will be billed directly for some of those charges.

The new plan was adopted by the commission last December, but the order describing how it will work — comprising 105 pages plus numerous exhibits — was not released until last week. Here are the main points of the FCC order:

- Charges will be shifted gradually over a seven-year period beginning in 1984. Part of the resulting increase in local rates will consist of a flat monthly charge per line, while the rest will be billed on the basis of usage.
- Local telephone companies will be allowed largely on their own to decide how much they wish to collect through flat charges and how much through usage-based fees. However, the commission has established certain limits: The flat charge must be at least $2/mo for residential users and $4/mo for business users. Moreover, the charge for business users cannot be more than two times larger than the charge for residential

(Continued on Page 10)

Competition Forces Change

The access charge reimbursement scheme had to be changed because the telecommunications industry is becoming more competitive. Since access charges represent a significant percentage of what the end user pays for service and the telephone carriers now determine, largely on their own, what those charges will be, the present system will not work in a market where multiple vendors are competing directly against many of those carriers.

As Federal Communications Commissioner James Quello put it in a statement appended to the commis-

(Continued on Page 10)

System Test Site Wins Settlement Of $1 Million

**By Jim Bartimo
And Susan Blakeney**
CW Staff

PITTSBURGH, Pa. — The Steel City has won roughly $1 million in an out-of-court settlement from Coopers & Lybrand, Inc. and Software International Corp. in a battle over what City Solicitor Dante Pellegrini called bad advice and unusable software. The settlement came after four months of negotiations but before the city filed a lawsuit.

The city controller's office decided in 1980 to upgrade its accounting and financial systems. It had been using an NCR Corp. system that could no longer handle all its various accounts. The city hired Coopers & Lybrand, one of the "Big Eight" accounting and consulting firms, to come up with a solution.

Coopers & Lybrand recommended a software package called Fiscal Control/80, which it had developed jointly with Software International of Andover, Mass. The consulting firm also recommended that Software International provide the needed hardware to the city.

The system put together by Software International was comprised of the Fiscal Control/80 software and a Hewlett-Packard Co. HP 3000 computer. It was installed in City Controller Jim McGrady's office in January 1982. By the middle of the first quarter, it became obvious that there were "serious problems" with the system, according to Pellegrini. At

(Continued on Page 8)

DG Unwraps Supermini to Rival 4341-12

Data General's Eclipse MV/10000 supermini introduced last week is compatible with the vendor's existing 16-bit and 32-bit systems.

By Ed Scannell
CW Staff

NEW YORK — Data General Corp. demonstrated a commitment to both its commercial and scientific users here last week by unwrapping a high-end 32-bit system it claims is 60% faster than IBM's 4341 Model Group 12 at one-third the cost.

The Eclipse MV/10000 is DG's most powerful supermini to date and will be targeted at both the office automation and industrial automation markets. Software-compatible with all of DG's 32-bit and 16-bit minicomputer lines and offering support for up to 192 terminals, it will be marketed as a mainframe replacement.

The virtual memory machine reportedly scores a single-precision Whetstone rating of 2,500, according to DG estimates. This is said to com-

(Continued on Page 7)

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Please address all correspondence to the appropriate department at Box 880, 375 Cochituate Road, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153.

OTHER EDITORIAL OFFICES & SALES OFFICES:

New York: Suite 7G, 401 East 80th St., New York, N.Y. 10021. Phone: (212) 570-2135.

West Coast: 257 Lytton Ave., Palo Alto, Calif. 94301. Phone: (415) 328-8064.

Washington, D.C.: 880 National Press Building, 529 14th St. N.W., Washington, D.C. 20045. Phone: (202) 347-6718.

England: Bill Dunlop, Stephen Thomas, [illegible] Assoc., [illegible] Caxwell Rd., Islington, London [illegible] Phone 01 278 3015/6

W. Germany: Eckhard [illegible], CW Publikationen, [illegible] 8000 Munich 40. Phone (089) 34-00-61. Telex 5215350

France: Franck Morel, Le Monde Informatique, 42, Avenue Montaigne 75008 Paris. Phone 720 95 46

Japan: Mr. [illegible] Kurita, Computerworld Japan, 7-4 Shinbashi 1-Chome, Chuo-ku, Tokyo 104. Phone (03) 551-[illegible]. Telex 252-4217. [illegible] Yamada, Tokyo Representative Corp., Yamaguchi Bldg., 2-12 Kanda Jimbo-Cho, Chiyoda-Ku, Tokyo 101. Phone (03) 230-4117[illegible]. Telex [illegible]

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest NSW 2065. Phone (02) 439-6133. Telex [illegible] AA25468

Brazil: Eric Hippeau, Data News, Computerworld do Brasil, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25/10th Floor 20031 Rio de Janeiro RJ Brasil. Phone (021) 240-4225. Telex 21 30838WORD BR

Mexico: Richard Small, Computerworld de Mexico, [illegible] 21-2 [illegible] Roma, Mexico City 7 D.F. Phone (905) 514-6218 (905) 514-4309

Spain: Ned Astley, Computerworld Espana, Gravina 13, Madrid 4. Phone 231-23-05, 231-23-0[illegible], 231-23-00. Telex [illegible] 46400 Madrid

Denmark: Preben Engell, Computerworld/Danmark, Gammel Strand 38, 1202 Copenhagen K. Phone 01-1234-11. Telex 27 [illegible]

Sweden: Bengt Marcstedt, Computerworld/Sweden, Ny Media AB, Vartavagen 50, 11530 Stockholm

Italy: Donato [illegible], Gruppo Editoriale Jackson, s.r.l. Via Rosellini 12, 20124 Milano

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IBM Hikes Lease and Rental Rates

By Ed Scannell
CW Staff

RYE BROOK, N.Y. — IBM has raised its short-term leasing and rental prices by an average of 8%, continuing to press customers who lease or rent its older mainframes and 3270 CRT terminals to buy those products.

The company also announced it is increasing contract maintenance charges on some products by 8% and decreasing maintenance costs on others by 20%.

Hourly maintenance charges become effective immediately, with all other changes effective June 1.

The products affected by the price changes include the IBM 370, 3033, 4300, System/32, System/34, System/38, 8100 and Displaywriter systems as well as the 3270 line of terminals. Purchase prices and three-, four- and five-year leasing agreements negotiated through the IBM Credit Corp. for these products will remain unchanged, a spokesman said.

The price change announced by IBM mean:

- Monthly rental charges on low-end 4331 and 4341 machines have jumped from $2,565 to $2,767 and from $9,729 to $10,505, respectively. Leasing charges on the low-end 4331 will be increased from $2,185 to $2,355, while leasing prices on the 4341 will go from $8,280 to $8,940.
- In the 3033 series, monthly rental charges on the Model A06 are now $118,085, up from $109,384, with leasing charges jumping to $107,350 from $99,440.
- On the 8100 series, Model A10, monthly rental charges are now $311, compared with the old rate of $288; leasing costs have been hiked to $265 from $246.
- The 370/115 now costs $4,191/mo to rent, compared with the old rate of $3,883. The Model 115's monthly leasing costs were increased to $3,810 from $3,530.
- The Model A01, which represents the low end of the System/32 series, now rents for $1,342, up from $1,243. Leasing charges for the system rose to $1,220, up from $1,130.
- The System/34 line's F36 rental fees were hiked to $3,992 from $3,692, while leasing costs jumped to $3,630 from $3,365.
- The Model 5381, a member of the System/38 line, now costs $2,403 to rent, up from $2,231, and $2,091 to lease, up from $1,942.
- The Displaywriter's monthly rental charges moved to $166 from $154, with leasing costs rising $10 to $136.
- IBM also increased rental and leasing prices on its 3270 line of terminals. As an example, the 3271 terminal now carries a $239/mo rental fee, compared with the old rate of $222, while its leasing charges rose to $204, up from $189.

Consistent Strategy

Charles Greco, manager of Information System Planning Services for International Data Corp., said in a recent interview that this latest round of price hikes is consistent with IBM's strategy over the past two years. That strategy has been to encourage customers who lease or rent its mainframes to buy those systems by raising leasing, rental and maintenance charges.

Greco contended this latest round of price increases may be more effective in prodding users to purchase their rented and leased mainframes than other price hikes over the past two years because of the improving economic conditions.

"Over the past 12 to 18 months, the economy has hurt them [mainframe users] so bad they couldn't take advantage of any deals IBM might have offered them. But now, as the economy starts turning around and interest rates start coming down, we think that will stimulate the direct purchases more than indirect purchases," Greco asserted.

By indirect purchases, Greco was referring to those users that, because of slashed DP budgets and high interest rates over the past two years, have asked third-party leasing firms to buy their rented or leased equipment and then rent or lease it back to them at a lower rate than IBM was offering.

Big Blue $51.08 Richer

BOSTON — Big Blue, prepare for a pleasant surprise. A check for $51.08 is waiting for you.

While it is unlikely that the New York Stock Exchange will feel the impact of this news, it seems the money has been lying untouched in an IBM account at Dataproducts Corp. for more than five years. Under the Massachusetts Abandoned Property Law, institutions holding accounts of over $5 that have been untouched for more than five years are required to notify the account holders. If the accounts remain unclaimed, the money is turned over to the state treasurer's office, which holds it until the owner comes forth.

A Dataproducts spokeswoman said she knows nothing of the unclaimed account and that the specifics of it were impossible to determine without more billing information. But the treasurer's office will not release billing information to anyone but IBM. The next move is up to Big Blue.

This Week

IN DEPTH

A Guide to Patenting Software ....Follows Page 60
Managing Departments in Conflict ID/25

NEWS

Model 204 DBMS Put Under CMS, VS(E) 4
'Pennet' Connects PE Series 3200 Superminis 6
DG Announces CAE Products 7
Ansi Endorses a Different Keyboard Design 9
Top Court Refuses Review of AT&T Settlement 11
Exec Finds End-User Productivity Hot Topic 12
Society Seen Next Victim of DP-Induced Stress 13
Architectural Firm's Commitment to CAD Grows 14
This User Group Tied Tightly to Its Vendor 16
Harvard Law's Miller Eyes Consensus on DP Law 17
Vendor Panel Explains OA Solutions 18
Resource Sharing Seen Crucial to Future Nets 19
Speaker Outlines OA Implementation Strategy 20
Marketing Rep Warns Micro Buyers to Beware 21
Budget Cuts Force State to Drop Personnel System ..24
Consultant Profiles Typical Computer Felon 25
Rep. Markey Likens AT&T Breakup to Divorce 29

EDITORIAL

Editorial: Smooth Sailing 30
Lecht on Science: A Turn of the Screw 31
Human Connection: Common Courtesy When Hiring ..31

SOFTWARE & SERVICES

Monitoring System Spells Relief for Bank 37
Emulation Package Fits IBM 38
I.P. Sharpe Adds Data Bases to Its T/S Services 42
Ordering System Unveiled 43
Programs Out for VAX-11s Under VMS 44
Financial Modeling Aid Targets Wang VS Users 48
Report Generator Unveiled for HP 3000 49

COMMUNICATIONS

Honeywell Introduces SNA Release 1.1 51
Cluster Controller Announced 52
'Teleterm' Targets Micros 55
Conversion Package Out 58
IBM 3101 Terminal Emulator Out for Displaywriter 59

SYSTEMS & PERIPHERALS

File System Frees Group's Paper Logjam 61
Terminal I/O System Unveiled 64
Tabor Unveils Microfloppy Drive 66
Course Creator Aid Out From CDC 67
Diskstor-Q Micro Based Around DEC 11/23 Q-Bus ...68

OFFICE AUTOMATION

Workstations of Future to Hear and Talk 69

COMPUTER INDUSTRY

Reshuffling at IBM Stresses Marketing 73
AT&T Subsidiary Battle Looms 73
AT&T Still Battling Separate Subsidiary Rule 74
Apple Continues Fight Against Counterfeits 77
DG Wins Contract Award From E.F. Hutton 79
NCR Reorganizes Internally 82
Hitachi Extends L-Series With Two Processors 84

ADVERTISING INDEX 116

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Last year, for example, we brought you the first high-performance sort program for VM, the fastest growing operating system. SyncSort CMS became an overnight success. It didn't use many resources – machine or human – and it was a pleasure to use. Today it has over 350 users.

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THE BAD OLD DAYS: Most of the VM Backups now in use are low-level programs, to put it charitably. (Subterranean might be a better word.) They simply use too many machine resources. And they require too much manual assistance from the operations staff.

As a result, much of the Backup, Recovery and Copying done in the nation's VM centers is just plain lousy. It's often done haphazardly...sporadically...or not at all. Heaven only knows how much this has cost in terms of destroyed data, incomplete records, and damaged reputations.

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Model 204 DBMS Put Under CMS, VS(E)

By Paul Gillin
CW Staff

CAMBRIDGE, Mass. — Computer Corp. of America (CCA) last week extended its Model 204 data base management system (DBMS) to IBM VM/CMS, DOS/VS and DOS/VSE operating system environments. The package had previously been available only to users running OS/MVS.

At the same time, the company announced full-screen editing and enhanced recovery capabilities, as well as an optional document-handling feature.

With this release of Model 204, DOS/VS and VSE users can write online applications without adding a teleprocessing monitor, a CCA spokesman said. Telecommunications access is supported via Btam for IBM 3270 terminals. Vtam support will be available in the third quarter, the spokesman added.

By providing a direct interface to Btam, Model 204 eliminates the need for a teleprocessing systems programmer, according to Larry DeBoever, CCA director of marketing.

The CMS version of Model 204 runs in native mode with no loss of performance, the spokesman said. The DBMS performs its own I/O and can be installed without modifications to CMS or VM.

The multiuser version of the DBMS reportedly allows large numbers of users to access concurrently and update data bases under the control of a Model 204 virtual machine without significant performance degradation. The virtual machines communicate with users via an interface to the Virtual Machine Communications Facility (VMCF), the spokesman said.

The VMCF interface can provide access from CMS to a copy of Model 204 residing under a guest operating system, DeBoever said.

The full-screen editing enhancement announced last week for the Model 204 DBMS is an IBM Xedit-like feature that allows users to view User Language procedures a screenful at a time and to make alterations using a cursor, CCA said. The transaction back-out capability allows the effects of an incomplete data base update to be reversed by undoing updates or incomplete transactions.

The Text/204 option is an on-line document storage and retrieval system that integrates textual data into the data base. Designed to compete with Infodata Systems, Inc.'s Inquire and IBM's Storage and Information Retrieval System, the option provides a full-screen user interface with menus, prompts and on-line help, CCA said.

The DOS/VS and VSE version of Model 204 is available immediately for $155,000. The CMS version, available in June, is priced at $195,000. The price of the DBMS includes a one-week, on-site training course in Model 204 and User Language.

Full-screen editing and transaction back-out is free to current customers. Text/204 costs an additional $30,000.

CCA is located at Four Cambridge Center, Cambridge, Mass. 02142.

'Maxicalc' Spreadsheet Out for IBM Mainframes

By Lois Paul
CW Staff

HASBROUCK HEIGHTS, N.J. — An on-line electronic spreadsheet package for IBM and plug-compatible mainframes running under OS and DOS with CICS was announced last week by Oxford Software Corp.

Oxford's Maxicalc is an interactive nonprocedural electronic spreadsheet software package that reportedly executes as a CICS application. It is menu driven and is said to require no data processing experience to operate. The software basically enables IBM 3270 terminals connected to a mainframe via CICS to handle electronic spreadsheets organized by rows and columns.

Maxicalc does not require any modification to CICS or the IBM operating system, Oxford said. It includes a 512-row by 64-col. spreadsheet capability, program function (PF) key support, a range of arithmetic operations, formula calculation capabilities, scrolling functions and split-screen viewing and direct row/col. positioning.

In addition, the software features hard-copy reporting capabilities and built-in spreadsheet security.

The functions of Maxicalc are made available through four menu screens that are presented as options in the main menu. These are Maxicalc Worksheet, Report Screen, Maintenance Screen and Options Screen, Oxford said.

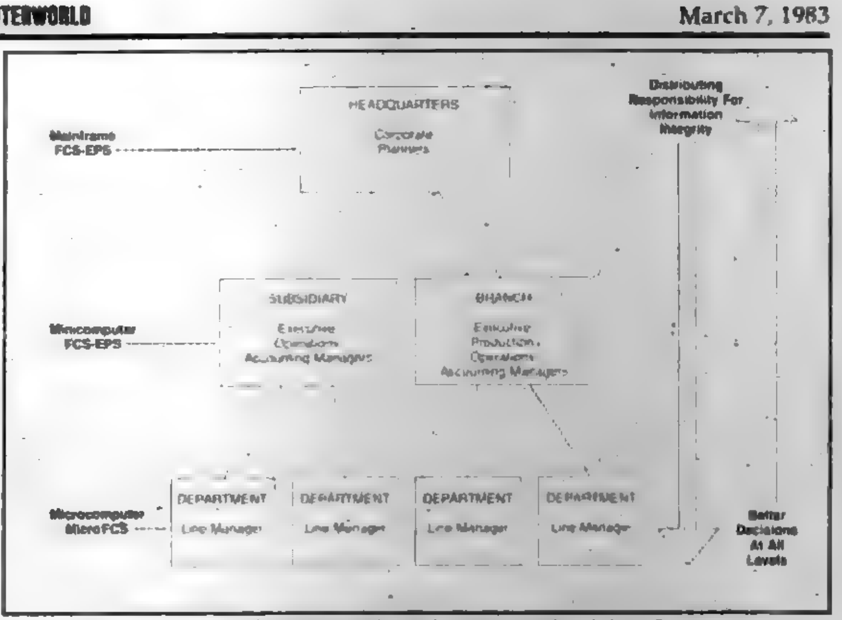
The worksheet is the main system screen where the user enters information into a grid of coordinates. The information will be calculated to a total of 15 significant digits and will be displayed based on the specified width of the field, the vendor explained.

The Report Screen enables users to specify which work sheet is to be printed on what printer. The file Maintenance Screen is the connection between the work sheet being viewed and data storage where work sheets are kept between terminal sessions. Vsam files are used, the vendor noted.

The Options Screen displays the PF key assignments used by Maxicalc, as well as the corresponding mnemonics.

Maxicalc runs on IBM 370, 4300 series, 30 series and plug-compatible mainframes. It supports CICS/VS Release 1.5 and up and the IBM Vsam access method.

The software is priced at $12,000 for the DOS version and $15,000 for the OS version. Oxford Software is located at 174 Blvd., Hasbrouck Heights, N.J. 07604.



Components of FCS-EPS for Distributed Decision Support

DSS for IBM Sites Runs On Micro to Mainframe

By Lois Paul
CW Staff

WINDHAM, N.H. — EPS, Inc. has announced a distributed decision support system (DSS) that runs on IBM systems from micros through mainframes. The software is composed of FCS-EPS, its DSS package for minis and mainframes, and its recently unveiled MicroFCS for microcomputers [CW, Jan. 10].

The distributed DSS, called FCS-EPS for Distributed Decision Support, provides a standardized decision support language, common information at all levels, mainframe modeling and analysis power on the micro and controlled additional use of existing corporate information, according to the vendor.

"In most organizations today, any decision support analysis is done at headquarters on the company mainframe. In the budgeting process, budgets are created and mailed in the old brown envelope to all involved. It's a one-way process — top down," said Robert J. Earle, president of EPS. "If people have computers at lower level operating entities today, you can just about guarantee they don't share information for decision support purposes. Through Distributed DSS, they will."

According to Earle, MicroFCS was the final component needed to enable companies to standardize their DSS models and forecasts to distribute DSS throughout the organization. MicroFCS, which allows simple row and column spreadsheet processing and multifunctional mainframe-style analysis, includes packaged applications driven from function keys and menu-driven operations, EPS noted.

All of EPS' DSS software reportedly operates with exactly the same syntax and procedures. Therefore, it is possible in the IBM environment to upload and download logic and data.

Corporate planners on the mainframe can run, check and analyze models developed on the IBM Personal Computer, and Personal Computer users can use parts of corporate models which pertain to them for detailed analysis of their own business responsibility, an EPS spokesman pointed out.

In addition, users can hook into external files for government statistics, Dow-Jones information or other data bases and include this information in models at any level of hardware use, according to the vendor.

FCS-EPS for Distributed Decision Support also is said to enable users to share a common data base if the machines on which they are running the software were designed for multiple users. For the Personal Computer, which is not a multiuser system, one can pass data back and forth and it is accessible through normal communications links.

FCS-EPS, the DSS for mainframes and minis, is available on IBM computers from the Personal Computer through the IBM 4300 and 30 series mainframes. It is also said to run on equipment from Hewlett-Packard Co.; Wang Laboratories, Inc.; Honeywell, Inc.; Sperry Univac; Digital Equipment Corp.; and others.

The mainframe version of FCS-EPS is priced from $48,000 to $140,000, depending on configuration. The minicomputer version of FCS-EPS is available for between $25,000 and $60,000, also depending on configuration.

MicroFCS is available for $300 up, depending on configuration and volume purchased.

The cost for FCS-EPS for Distributed Decision Support is configuration-based and depends on the price of its components, the vendor spokesman said.

Further information can be obtained from EPS, Inc. at One Industrial Drive, Windham, N.H. 03087.

Corrections

In "Users Fighting to Contain Costs" [CW, Feb. 21], it was incorrectly stated that Global Marine, Inc. of Houston has reduced software maintenance costs to 60% of its software budget. Maintenance costs were actually reduced to 40%, while new development increased to 60%.

The Wordstar diskette mentioned in Werner L. Frank's "Fake Apples in Hong Kong: Rotten to the Core" [CW, Feb. 28] is from Micropro International Corp., not Xerox Corp., and the Z80 Softcard is from Microsoft, Inc., not Zilog, Inc.

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June 20-24 Anaheim

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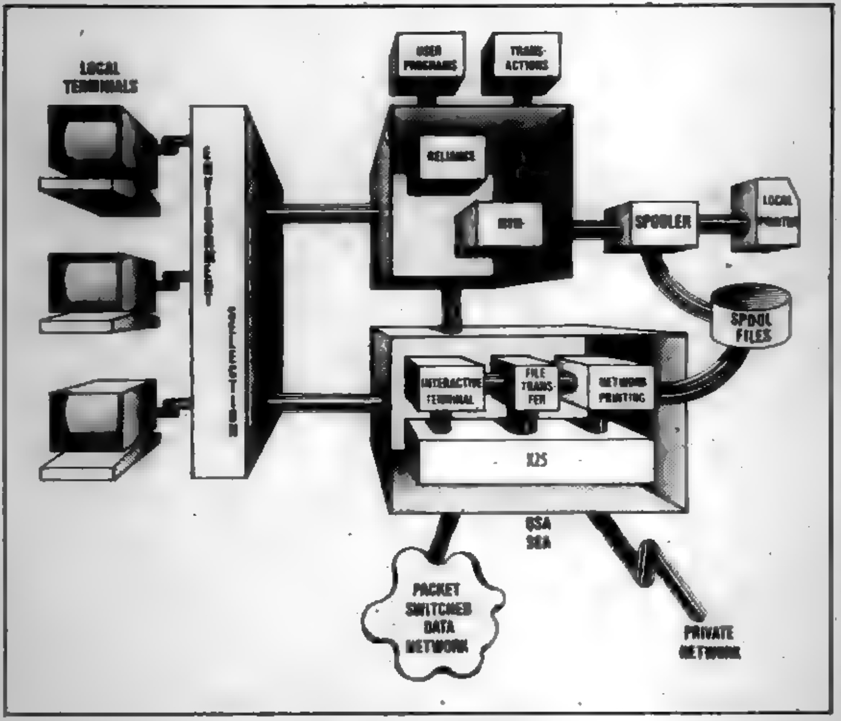
'Pennet' Connects PE Series 3200 Superminis

By Lois Paul
CW Staff

OCEANPORT, N.J. — Perkin-Elmer Corp. is scheduled to announce today networking software to interconnect its Series 3200 superminis for data and resource sharing.

The Pennet software enables the 32-bit machines in dispersed or clustered configurations to communicate with each other over private lines or via packet-switched networks. This allows a user to tailor its DP resources to meet its daily requirements; extra computing power that is needed only occasionally can be pulled from the network when needed, the vendor explained. Resources at different sites, therefore, can be shared instead of duplicated.

Pennet is based on the CCITT X.25 standard for computer-to-computer communications through packet-switched data networks such as GTE Telenet Communications Corp.'s Telenet in the U.S., the UK's Packet Switching Service and West Germany's Datex-P.



Pennet Architecture

Expansion Plans

In the near future, the software will be expanded to support IBM's Systems Network Architecture and the Ethernet standard interface for local-area networks, according to Michael R. Winters, PE senior marketing manager.

Pennet is intended to complement other PE communications products that include IBM 2780/3780 remote job entry facility; a Hasp emulator for file transfer between PE machines and IBM computers or between two PE machines; and an emulator for IBM 3270 Binary Synchronous Communications which enables applications using PE data bases to access a remote IBM data base.

Pennet's Interactive Terminal Facility reportedly allows terminals attached to one PE system to log on to PE's Reliance transaction processing or Multi-Terminal Monitor (MTM) time-sharing environments in a second PE system and have the same capabilities as if they were directly attached to the system. Messages to and from several terminals would then be concentrated in the local computer and multiplexed over a single synchronous communications link in the network, eliminating the need for long-distance communications links between geographically dispersed terminals and computers, the vendor noted.

Pennet's File Transfer Facility is said to allow files of any length to be transferred from one system in the network to another system on the network. For example, users could perform data collection in remote systems and transfer files for processing when needed.

A Network Printing Facility allows programs running under the PE OS/32 operating system, MTM or transaction processing environment to output data such as reports, memos and operating data to printers connected to other PE superminis in a network. Pennet's Network Control Facility maintains a log of significant events that occur during network operation and allows communications lines to be removed from the network for maintenance or error analysis.

With Multilevel Security

Pennet includes multilevel security that is controlled by the target environment, as well as facilities to control access to the network on a terminal-by-terminal basis, according to Winters.

Pennet runs on the full range of PE superminis, including Model 3210, Model 3230 and Model 3250. An initial Pennet package is available for $7,000; copies cost $1,725 each. This fee includes initial service maintenance, which is comprised of a 90-day warranty for the software and all adjustments to the software for nine months after purchase.

Optional maintenance agreements after the first year include the software service agreement and extended software maintenance. The former is available for $200/mo and includes provisions under which PE personnel go to user sites to install any Pennet enhancements. The latter, available for $400/year, provides users with documentation of any changes to the product.

The Pennet software is available immediately from PE, 2 Crescent Place, Oceanport, N.J. 07757.

Study Says Bypass Solutions Unfeasible

(Continued from Page 1)

market should be worth $28 billion, Perspective Telecommunications said adding that the telephone companies will get all but about $2.3 billion.

Restricted Support

In addition to relatively limited coverage and the need for extra help from customers, bypass technologies generally are handicapped by limited bandwidth and/or range. That means the number of applications they can cost-effectively support is restricted, the study noted.

The study also maintains that if a user's local telephone company can provide high-speed data transmission equivalent in quality and price to that offered by a bypass provider, the user will do business with it rather than with a bypass provider.

The key questions, therefore, are whether the local telephone companies' rates will remain competitive and how quickly they will upgrade their existing networks.

On the first point, "it can be very reliably predicted that for at least the next five years the cost of local circuits will rise," the study said, largely because of the higher access charges recently mandated by the Federal Communications Commission. Perspective Telecommunications contended that business, rather than residential users, will pay the bulk of the increase.

On the second point, the study noted that the telephone companies have already begun adding digital capability to their networks, but "it will be some years before the effect of this activity is felt by the marketplace." However, it is unclear whether user demand will overload the wideband facilities that local telephone companies make available in the meantime.

The appeal of the telephone companies will also depend partly on how quickly competing CATV facilities become available. According to the study, "CATV demonstrates the greatest potential as an alternative to [telephone company] local circuits. They overcome the limited bandwidth and limited range of other bypass technologies."

Two-way CATV systems dedicated to business and institutional users "are now being installed in the business districts of many cities," the study pointed out. In addition, "hardware is available today to address the large user's requirements," and while "CATV operators are not familiar with the commercial market" or with the specific needs of data communications users, the association of CATV companies with voice/data transmission firms represents a possible solution to this problem.

The current collaboration of MCI Communications Corp. and Cox Cable Corp., for example, "is likely to produce some very effective solutions for large customers."

Westinghouse to Transmit via Cable TV

(Continued from Page 1)

communications users are looking for alternatives to telephone-company-provided local circuits because of the higher charges expected because of the breakup of the Bell system next year. Meanwhile, CATV operators and other "bypass" vendors are trying to establish their credibility.

"We chose cable TV mainly to reduce the chance of service interruptions," explained Westinghouse Communications Manager Bob Bennis. Microwave transmission is risky in downtown Pittsburgh, he said, because construction of a new building can force rerouting of the transmission path.

Asked about the relative cost of cable TV, Bennis said comparisons are hard to make because "we're leasing from Warner-Amex; whereas, we would have purchased microwave facilities."

Comparing Costs

Comparing the cost of the Warner-Amex channels to equivalent offerings from the phone company is also difficult, he added, because T-1 circuits capable of operating at 1.544M bit/sec are not available locally from Pennsylvania Telephone Co.

Westinghouse will lease three 1.544M bit/sec cable TV channels from Warner-Amex. They will form part of the Westinghouse Digital Information Network (Wesdin), a microwave-based private system interconnecting company locations throughout the Greater Pittsburgh area. The network, now about 60% complete, currently serves about 9,000 terminals, Bennis said.

The three CATV channels will link a Wesdin hub office with two end offices about three-quarters of a mile away, explained Wesdin Manager Bill Hunkele. At each end of each channel will be a T-1 interface connected to a digital private branch exchange. Each of the CATV channels is subdividable into 24 digital voice channels.

Initially, about 90% of the capacity will be used for voice, the rest for data transmission at speeds up to 56K bit/sec, Hunkele said.

Warner-Amex is now building a two-way, three-trunk cable TV system in Pittsburgh. One trunk, serving the downtown area and a number of outlying commercial areas, will be dedicated to business and institutional users and will supply the channels leased to Westinghouse.

DG Unveils 4341-12 Rival

(Continued from Page 1)

pare with ratings of 1,100 for IBM's 4341-12 processor and 1,200 for Digital Equipment Corp.'s VAX-11/780 superminicomputer.

The company attributes the system's speed to a dedicated address generator that operates with a two-board Floating Point Unit and three system caches. The dedicated address generator, which DG claims is the first such device to be incorporated in a category of machine like the MV/10000, speeds processing capability by creating logical addresses from the instruction stream.

The three system caches include a 16M-byte mapped memory cache, a 4K-byte instruction cache to speed up instruction fetching and a 1,024-entry address translation cache that is said to accelerate the logical-to-physical translation process.

Other features aimed at increasing overall system speed include a dual-ported memory system capable of transferring 57.2M byte/sec of data and two I/O controllers that provide users with a range of bandwidths large enough to accommodate varying applications and peripheral performance characteristics.

While the system offers an extended upgrade path for current DG computer users, it is also billed as a mainframe-replacement. According to DG Information Systems Division Vice-President David Lyons, many large organizations have been unable to implement large-scale commercial applications because of what he claims is the high cost of mainframes and the lack of quality software.

The MV/10000 system will reportedly support 100 workstations at a cost of $7,500 per station.

The basic version of the MV/10000, which comes with 2M-bytes of main memory, a 147M-byte disk, a dual-mode tape drive, a 16-line intelligent asynchronous controller, a Dasher TP2 printer with keyboard, the firm's AOS/VS operating system license and cabinet, costs $211,000.

A 100-workstation office system with 8M bytes of memory, two disk subsystems, two dual-mode magnetic tape subsystems, seven asynchronous controllers, one intelligent synchronous controller, the Xodiac Network Management System, LDP laser printer, 10 letter-quality printers, 100 Dasher workstations, AOS/VS operating system, Comprehensive Electronic Office software and Cobol language costs $686,270.

The system, graphics workstation and terminal are expected to be available in 90 days.

Information about the MV/10000, graphics terminals and workstations is available from DG, 4400 Computer Drive, Westboro, Mass. 01580

Cullinet Gets New President

WESTWOOD, Mass. — Robert N. Goldman last week was named president and chief operating officer of Cullinet Software, Inc. (formerly Cullinane Database Systems, Inc.), succeeding John Cullinane.

Cullinane will remain as chairman and chief executive officer of the company he founded. He said his future activities will be devoted to long-range planning and corporate development.

Goldman, 33, has been executive vice-president of Cullinet for more than a year. Previously, he was responsible for technical development of the company's Integrated Database Management System (IDMS), vice-president of software development and senior vice-president of product development. He was with AT&T before joining Cullinane in 1973.

Frank L. Chisholm has been named executive vice-president succeeding Goldman. Chisholm, 34, has been senior vice-president since 1980, responsible for sales of the company's integrated software systems.

DG Announces CAE Products

NEW YORK — In addition to introducing its high-end MV/10000 supermini here last week, Data General Corp. also announced a series of computer-aided engineering (CAE) hardware products, a first for the firm in this area.

The CAE products include:

- The GW/4000 Expert Workstation; a high-resolution color graphics system based around the company's MV/4000 processor. A typically configured system is priced at $68,300.
- The Dasher G500 color graphics terminal, capable of displaying bit-mapped, medium-resolution graphics for business applications. This unit is priced $9,500, according to the vendor.
- The GDC/1000 Graphics Display Controller, an OEM-oriented two-board version of the GW/4000 workstation. The 768-pixel by 1024-pixel version of the product lists for $21,900.

The MV/10000 general-purpose computer system introduced last week can also be used for industrial automation applications — chief among them CAE, noted Don McDougall, director of the company's Technical Products Business Unit. Examples of CAE applications include mechanical engineering, electronic and electrical engineering and architectural engineering and construction, McDougall added.

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Other Keyboards Proposed Over the Years

By Patricia Keefe
CW Staff

Despite the longevity of what is called the Qwerty keyboard, several alternate designs have been proposed over the years in addition to the Dvorak model, which was accepted with a few changes by the American National Standards Institute last week.

The primary complaint about the Qwerty keyboard, named after its first six letters, is that the keys were arranged to slow down deliberately typists and prevent early manual typewriters from jamming. However, a study conducted in 1949 and published in the *Journal of Franklin Institute* outlined five major areas where keyboard improvements could upgrade operator performance:

- One-handed motions consumed, on the average, 75% more time than two-handed motions, which tend to be easier and faster.
- The Qwerty keyboard required users to reach from the home, or middle row, where the fingers rest, for 68% of all key strokes. The study suggested putting 70% or more of the strokes in the home row.
- The hardest motions were found to be one-handed motions with reaches to one or two rows above the home row.
- The Qwerty keyboard was found to overload the left hand with 56% of the total strokes.
- The Qwerty keyboard resulted in many awkward one-handed fingerings and the load on each finger was not equally distributed.

One keyboard design that attempts to address these problems is the Dvorak method, introduced 50 years ago. Study results have been limited and so far do not prove Dvorak's superiority over Qwerty.

Another alternative is the Alphabet Layout, which might be preferable for nontypists required to input alphabetic data, according to Robert W. Bailey's *Human Performance Engineering: A Guide for System Designers.* But at least two studies have failed to show an advantage in this situation.

In 1926, a German named Klockenberg published his ideas on typewriter design, which essentially entailed dividing the keyboard into separate sections for the left and right hand.

And PCD Maltron, Ltd. received a U.S. patent in January 1981 for its split keyboard, which places the special function keys, numbers and the "E" and space keys in the middle of a curved keyboard. Maltron maintains the Qwerty design imposes a great deal of physical stress on the operator and claims their board is designed to minimize that stress.

Pittsburgh Wins $1 Million Settlement

(Continued from Page 1)

one point, he said in a recent interview, there were 47 different flaws in the program.

By April, the situation had become so serious that the city controller's office was offloading its financial and accounting processing to Pittsburgh's DP function, known as City Information Systems, and utilizing an outside service bureau. City employees were asked to work 14-hour days to keep city records up to date, the *Pittsburgh Press* reported.

Touche Ross Co., another "Big Eight" accounting firm, has replaced Coopers & Lybrand. It is working on a temporary solution for the controller's office and conducting a new requirements study.

The $1 million award is made up of $530,000 that Pittsburgh had paid to Coopers & Lybrand, $230,000 to reimburse the city for implementation losses and $76,000 to reimburse the city for the time it operated the system. The remaining money represents a forgiving of debts by Software International and Coopers & Lybrand and a year's use of the hardware at no cost to the city.

Asked last October what Software International's responsibility was to the City of Pittsburgh, Tim Cronin of the vendor's legal department said that the city was acting as a beta test site for Fiscal Control/80 and that its license for the software did not carry a warranty. Moreover, he maintained, Software International had offered to revise the program to address all of the city's complaints, but the city refused to let it.

Since the settlement, however, Joseph Powers, product manager of Software International, commented, "The settlement appears to be a fair and equitable one all the way around. We're glad it's settled."

A spokesman for Coopers & Lybrand last week said "no comment" when asked for the company's reaction to the settlement. Last October, however, another Coopers & Lybrand spokesman denied any "conflict of interest" charges in connection with its recommendation of the Software International package and maintained that the software could "surely" have been made operational "given enough time and effort."

Pellegrini feels "pretty good" about the settlement, but also believes "we are back to square one."

Pellegrini added that the case has taught him several painful lessons. "When you pick consultants," he advised, "check out the software they recommend to make sure it works. Also, realizing it isn't a perfect world, pick a consulting company that has the financial resources to back it's mistakes."

Massachusetts Town Also Gets Its Money Back

BROOKLINE, Mass. — While Pittsburgh can feel satisfied about its hefty cash settlement with Coopers & Lybrand, Inc. and Software International Corp., another test site for Software International's Fiscal Control/80 financial management package has a different story to tell.

Last October, the user — the Town of Brookline — got back from Software International the $65,000 it paid for Fiscal Control/80 when it found the package inadequate for its needs, according to a town spokesman who requested anonymity. In this case, no court action was threatened or necessary.

Brookline had agreed to be a test site for the package. In July, when the package had been in use for about a year, Brookline returned the package with little trouble.

"The system needs some additional work," the spokesman explained. Software International "tailored the system a lot more for manufacturing than for government."

The general ledger part of the package was "superb," but the purchase order and other subsystems were so cumbersome that additional staff would be needed to modify them, he added.

Brookline accepted the risks of a test site while Pittsburgh did not, he said. "We fully understood what a test site is. We understood that it might not go, but Pittsburgh didn't understand what a test site is."

Pittsburgh had additional problems with the presence of a third-party consultant — Brookline did not employ Coopers & Lybrand — and there was some question as to the city's role in the failure, the Brookline spokesman said.

"It was partly Pittsburgh's fault," he added, contending that Pittsburgh had not adhered to the vendor's specifications. "When you get into an agreement with a vendor, you do what they say, you don't go fooling around with it at night when no one is around. I spoke with Pittsburgh and asked them why they were doing some of the things they were doing.

"Pittsburgh has a political problem," the spokesman continued. "The way the story broke in the press, they had to threaten court action."

Kentucky, Too, Returns System

FRANKFORT, Ky. — The state of Kentucky experienced problems similar to those of Brookline, Mass., when it served as a test site for Software International Corp.'s Fiscal Control/80. Like Brookline, it did not threaten court action because Software International took the financial management system with no hassle.

Robert Neasham, a systems designer who directs Kentucky's information systems, took partial responsibility for the project's failure, explaining that the state was attempting to accomplish a major overhaul of the accounting systems in only a few months. "It was not a default situation," Neasham said. "The amount of support that Software International put in was fantastic and the general ledger was very good."

The major fault of the package was that "it was not error free. I couldn't jeopardize the state's financial system," he said.

Neasham did not suffer much damage from the failure of Fiscal Control/80 because he had a backup system waiting in the wings. He is now studying other methods of upgrading the state's system.

When Kentucky decided last April that the four-month-old system was not adequate for its needs, it returned the package without incurring any charges. "We were a beta test site and would not pay for the package until it was fully functional," Neasham explained.

Kentucky, like Pittsburgh, Pa., employed Coopers & Lybrand, Inc. When it turned in the software package, it retained the consulting firm, paying $700,000 of a $1.2 million contract.

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Ansi Endorses a Different Keyboard Design

By Patricia Keefe
CW Staff

A little over 100 years after the introduction of the typewriter, typists' fingers are still tripping over little-used keys in their journey toward the more popular keys, awkwardly placed on the outer reaches of what is called the Qwerty keyboard.

Now all of that may change.

Last week, after 12 years of subcommittee debate, the American National Standards Institute's (Ansi) Board of Standards Review adopted the Alternate Keyboard for Alphanumeric Machines, which is intended as an alternative to the Qwerty keyboard.

The Ansi X4.22 standard is based on a keyboard design introduced 50 years ago by August Dvorak, a University of Washington professor. Unlike Qwerty, which is named after the first six letters on the keyboard, the Dvorak, or Simplified keyboard, takes into account the frequency of letter usage within a language.

Dvorak supporters claim the keyboard has three advantages over Qwerty: greater speed, fewer errors and more comfort. The X4.22 standard differs from the Dvorak design only in the placement of three punctuation keys.

Advocates such as the Dvorak International Federation and Ansi believe D-v-o-r-a-k will soon spell relief for millions of typists. But, because they will have to learn how to type all over again, user resistance could sound the death knell for the new standard.

Nevertheless, some vendors are pushing ahead with marketing strategies promoting a keyboard that can be switched from Qwerty to Dvorak and back again. And some users, such as the state of New Jersey, think the new keyboard could save them millions of dollars each year.

Harvard University research associate Richard Land, long a Dvorak supporter, points out that while the design of the hardware itself has come a long way from the first wooden type bars, the keyboard, purposely designed to be slow to avoid jamming, has remained relatively the same. Since the mechanical problems that inspired the awkward key placement have long since been resolved, Land suggests promoting the Dvorak keyboard, designed for comfort and speed.

One Step Further

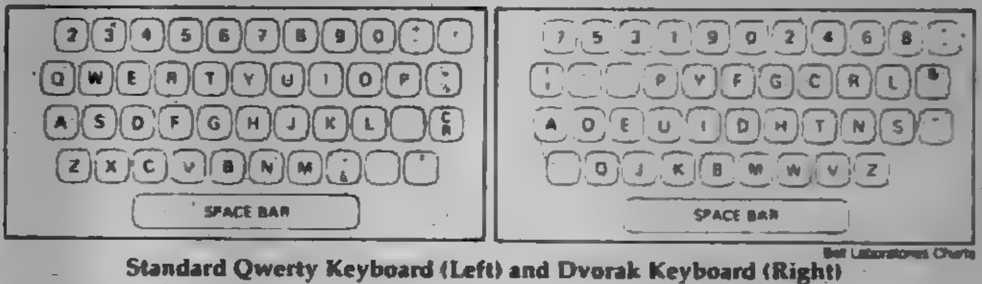
Taking Dvorak one step further, Land would like to split the alphabet in half and place the special function keys in the middle of the board to make them more accessible. This idea is not new. PCD Maltron, Ltd. of England already offers a similar, curved keyboard said to provide tactile feedback to the operator, as opposed to the traditional touch keyboard.

However, Land's first goal is the acceptance of the Ansi standard. His target is what he sees as a whole new community of sophisticated users just now coming on line. Those users, comprised primarily of executives with their first micros and students, will be the easiest to convert because they have not already learned the Qwerty keyboard.

For those earning a living by typing who may be a bit more set in their ways, Land thinks the standard's three advantages — more speed, fewer errors and more comfort — may win them over. For example, 3,000 words can be typed from Dvorák's home (middle) row alone compared with about 100 words on the Qwerty setup, according to Land.

However, three problems remain for Simplified advocates to surmount: tradition, the costs of hardware replacement and training and motivation. A new generation of typists exposed only to Dvorak is expected to erode tradition, and the prospect of an increase in productivity of even 5% to 10% supplies the motivation and justifies the cost. "In one year, you could make up the cost of retraining and hardware in terms of increased productivity," Land said.

The software capability for switch-selectable keyboards has been available from vendors such as Apple Computer, Inc., Olivetti Corp., Exxon Corp., SCM Corp., Wang Laboratories, Inc. and Osborne Computer Corp., according to Virginia Russell, president of Dvorak International Federation. Also, "contrary to what people may think, IBM has been very cooperative," she said.



Bell Laboratories Charts

Standard Qwerty Keyboard (Left) and Dvorak Keyboard (Right)

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Content

The intent of these books is to develop a basic programming skill in assembler language. As a result, the initial emphasis of each book is on a professional subset of BAL along with the related debugging skills. If you did nothing more than master this material (chapters 1-5), I think you would justify the cost of the book several times over.

Beyond this, table handling, subroutine and subprogram linkage, and sequential and ISAM file handling are given primary emphasis. Since these are common programming functions, this material is valuable background regardless of the language you normally use.

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CW's April 25 issue will include a Special Report covering manufacturing in transition and the part that computerized systems are playing in that transition. We are looking for articles on how the new manufacturing technologies fit together and what they mean to data processing operations in a manufacturing environment.

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Competition Forces Change In Charge Reimbursement

(Continued from Page 1)

sion's recent order explaining how the new reimbursement plan will work, "Moving toward competition and away from monopoly requires that the industry move toward cost-based pricing."

Despite this change, some things remain the same. Ever since 1934, the nation's telecommunications policy has been aimed at promoting universal telephone service and preserving the telephone carriers which provide that service. The new access charge plan has similar goals, Quello said.

The commission's first consideration, he said, was that "the concept of universal service not be sacrificed." The second was to minimize "the threat that the local exchange would be bypassed by large users."

AT&T, he added, "has claimed that 5% of its customers generate 63% of its revenues. By ignoring the threat of bypass, we could only encourage more and more of those large users to leave the local exchanges across the country."

According to another FCC commissioner, Joseph Eogarty, the commission has found an "appropriate balance between the need to encourage efficiency and the need to promote universal service. Under this structure, uneconomic bypass should be discouraged while at the same time there should be no substantial service dislocations."

Others are not so sure. One communications attorney suggested that the FCC's new plan will generate a record number of objections from users and AT&T competitors.

Another possible bone of contention was mentioned by FCC Commissioner Stephen A. Sharp. His point was that since the local exchange network is used for both local and long-distance calls, cost-based rates should be established for each. The FCC's new access charge reimbursment scheme, since it covers only the local exchange costs related to interstate calls, doesn't satisfy this requirement.

Rates for local and intrastate long-distance services remain subject to state regulation at least partly because the states don't want to relinquish control to the federal government. Sharp believes that "as distinctions between jurisdictionally interstate and . . . intrastate communications become increasingly blurred . . . the desirability of cost-based local exchange rates for each local area will become increasingly apparent."

One problem, however, is that the present scheme enables many business users to obtain long-distance service at bargain-basement rates. This is because they pay a "B-1" rate for local service that enables them to access private long-distance networks.

More to Be Paid To Phone Firms

(Continued from Page 1)

users, the order stated.

- "Before the end of the fifth year of the transition," according to the commission's order, "we will evaluate the rules and policies adopted in this order and, if necessary, will make adjustments."
- "We are directing AT&T to prepare the initial . . . tariffs to ensure that [the new] access charges will be in place on Jan. 1, 1984."
- Since the local exchange costs of handling interstate calls are now assessed entirely against interstate carriers, switching some of those charges to the end user presumably will reduce the carriers' costs. However, it is unclear whether the carriers will charge any less for interstate service.

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Top Court Refuses Review of AT&T Settlement

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — "The judgment is affirmed," the U.S. Supreme Court succinctly said last week as it refused to review the U.S. vs. AT&T antitrust case settlement approved last summer by U.S. District Court Judge Harold H. Greene.

Although the high court decided 6-3 against reviewing the settlement, the vote was in one sense a close one. If one more justice had voted for review, it would have been necessary.

The review was requested by 13 states in addition to Tandy Corp. and the North American Telephone Association (Nata). The states said Greene had violated the U.S. Constitution by not consulting with state regulatory agencies before accepting the settlement. Tandy, a manufacturer of interconnect equipment, felt the settlement should have required more sharing of AT&T patents. Nata, the chief trade association of the interconnect industry, was mainly unhappy with Greene's decision permitting the Bell operating companies to sell terminal equipment.

In announcing the Supreme Court decision not to review the settlement, Associate Justice William Rehnquist, who wrote the dissenting opinion on behalf of himself, Associate Justice Byron White and Chief Justice Warren Burger, confined himself to the constitutional issue: "I am troubled by the notion that a district court, by entering what is in essence a private agreement between parties to a lawsuit, invokes the supremacy clause powers of the federal government to preempt state regulatory laws. The District Court may well be correct, but I am not prepared to create a precedent in this court by summarily affirming its decision. This is particularly true whether the summary affirmance disposes of the merits of the states' contentions."

AT&T said it was "delighted" with the high court's decision and will "proceed on the schedule we have set out for ourselves" of completing the divestiture of the operating companies by next January.

Cbema Tells FCC: Don't Let AT&T Market Earth Stations

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — AT&T should not be allowed to market receive-only earth stations directly, the Computer and Business Equipment Manufacturers Association (Cbema) told the Federal Communications Commission (FCC) late last month.

Cbema, whose members include IBM and other major DP manufacturers, was responding to a phone company petition seeking clarification of the FCC's Second Computer Inquiry decision. The decision classifies receive-only earth stations and other terminal gear as competitive products: that means that unless it can persuade the FCC to grant a waiver, AT&T must market such items through a separate, deregulated subsidiary.

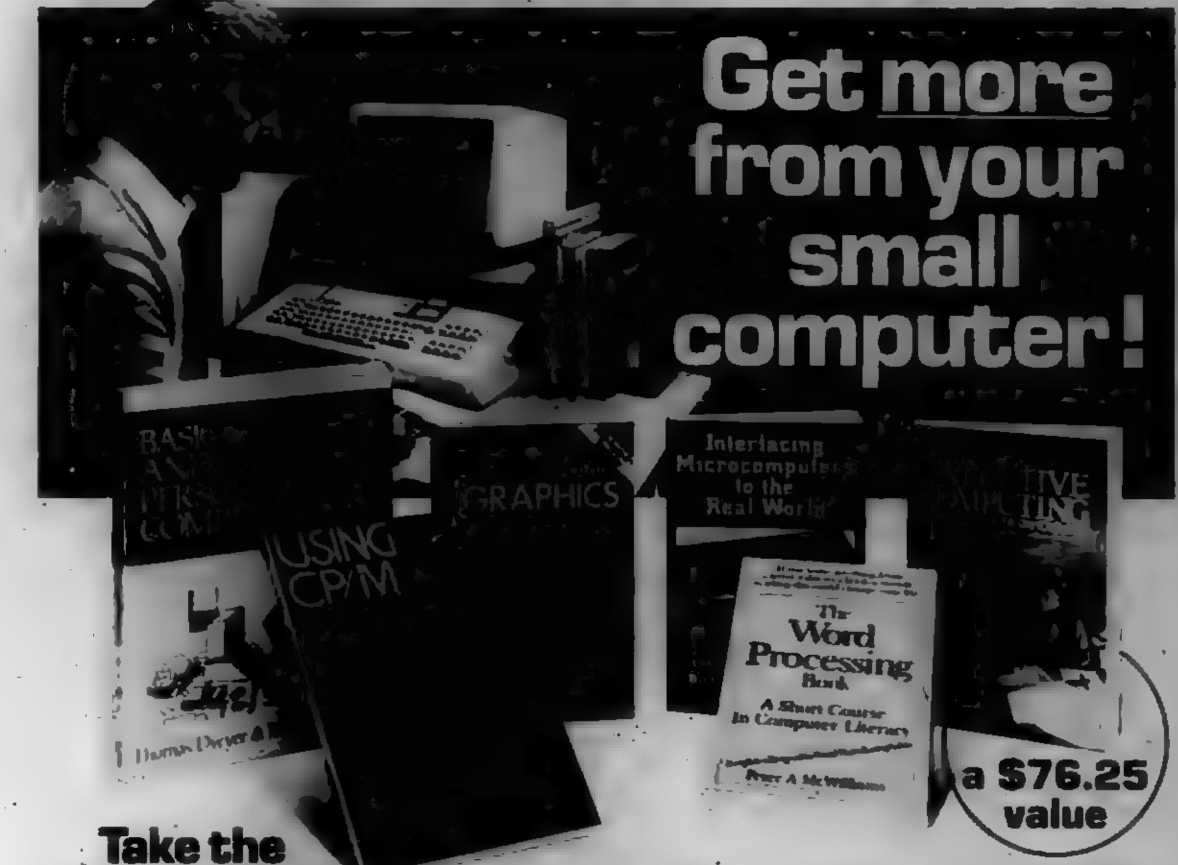
In its petition to the FCC, the phone company said that allowing AT&T's Long Lines Division, which operates the phone company's long-distance communications network, to market receive-only earth stations would facilitate network maintenance and testing operations.

However, competitors suspect that AT&T has something else in mind. They point out that the phone company now is the exclusive supplier of the Dataphone Digital Service interface — officially known as a "channel service unit" — as well as the network channel terminating equipment to be used in connection with upcoming phone company network offerings.

In both of those cases, explained a Cbema attorney, the phone company has argued that the interface is part of the network since it supports network maintenance and testing functions and thus must be controlled by Long Lines. AT&T's recent waiver petition reiterates this argument, he noted.

The earth station waiver request is one of three now pending before the FCC. The others, if granted, would allow Long Lines to market terminals and smart network services to the U.S. Department of Defense plus specified federal agencies that deal with natural disasters and similar emergencies and allow Bell operating companies to offer Centrex terminals (officially, "50B console equipment"). Earlier, the operating companies were granted a waiver allowing them to market terminal equipment to the physically handicapped, but Teletype Corp., an "unseparated" AT&T subsidiary, was refused permission to market terminals to domestic end users.

Meanwhile, the FCC has begun an inquiry into the question of whether and to what extent the operating companies should be required to offer terminals and enhanced services only through separate subsidiaries.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Exec Finds End-User Productivity Hot Topic

By Jeffry Beeler
CW West Coast Bureau

SCOTTSDALE, Ariz. — End-user productivity has replaced hardware and software as the chief topic of interest in DP performance management circles, according to Applied Computer Research, Inc. (ACR) President Phillip Howard.

Only five or six years ago, performance management focused primarily on optimizing the operation of corporate mainframes and their associated programs.

Today, however, the emphasis in performance management is rapidly shifting, with attention increasingly being devoted to issues that primarily concern senior executives rather than systems technicians, Howard said here last week during an ACR-sponsored conference.

Five Critical Elements

Howard described DP performance management as an enterprise consisting mainly of five critical elements:

- Capacity planning.
- A definition of user service objectives and agreements.
- Mechanisms for tracking and reporting systems performance.
- A means of tuning or adjusting information systems to ensure they meet target performance specifications.
- A system of charging application development costs back to nontechnical end users.

Underlying these five critical management-oriented elements is a much larger base of technological tools and concepts, some of which include hardware and software monitoring, systems modeling and simulation, program optimization, job accounting, statistical analysis and benchmarking, Howard said.

"Of course, you will still be able to manage your system's performance even if one or more of the critical elements is missing," Howard told his audience during a prepared presentation.

"But you really need to have all five if you want to create a truly integrated performance management program," he said.

In communicating with their companies' top executives, information systems managers should keep constantly in mind their target audience's interests.

Variables like response times and throughput may be of great concern to systems technicians, but for high-echelon executives, the only two meaningful measures of DP performance management are people and dollars, the ACR president said.

In an additional tip about how to deal with senior managers, Howard urged information system heads to build a reputation for accurately forecasting their firms' long-term DP performance requirements.

"If you've been seriously wrong [in your predictions] several times in the past, why should the president of a corporation believe you'll be right in the future?" Howard asked.

Justice Seeks Dismissals In IBM Case

SAN FRANCISCO — The U.S. Justice Department may drop charges against two employees of Japanese firms charged with conspiring to transport IBM trade secrets to Japan.

The Justice Department last week filed an agreement in Federal District Court seeking dismissal of all charges against Kunimasa Inoue, a programmer with Hitachi, Ltd., provided he does not violate any U.S. laws between now and June 30, according to Herbert B. Hoffman, the government's chief prosecutor in the case.

In addition, Hoffman said, the government is planning similar action in the case of Keiko Shiari, an employee of Nissei Electric Trade Co., which did contract work for Hitachi.

In that case, the Justice Department has yet to petition the court formally for dismissal of the charges, Hoffman indicated.

Minimal Involvement

Both men had minimal involvement in the attempt to ship allegedly stolen IBM documents to Japan, Hoffman said.

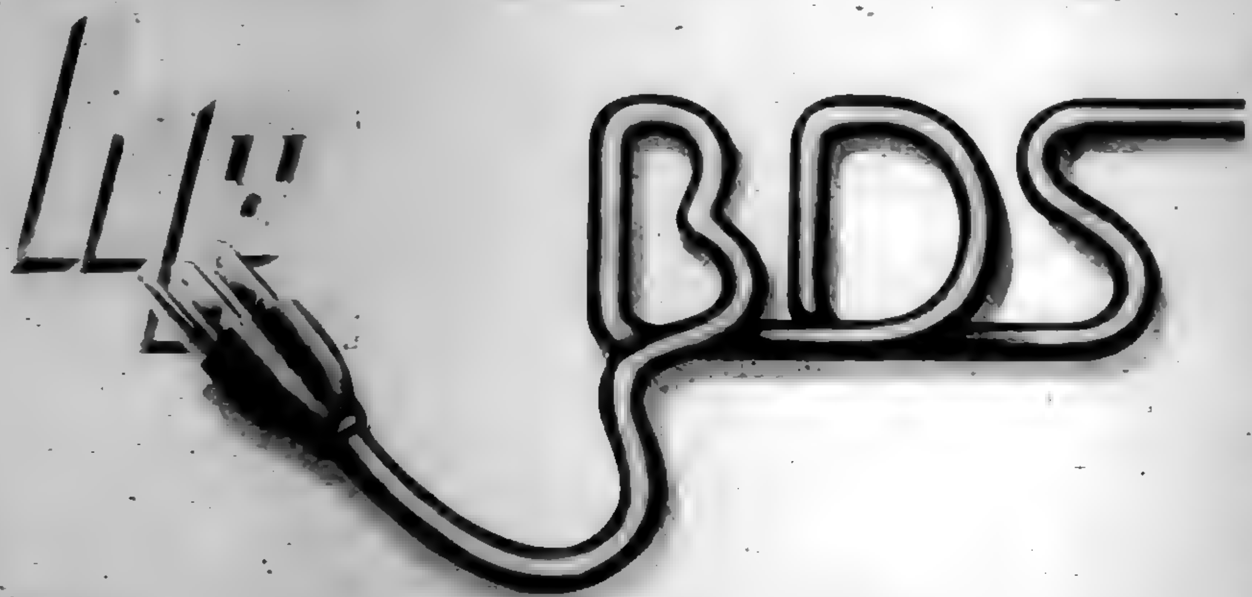
The chief prosecutor explained that neither of the men had prior criminal records and that the Justice Department felt prosecution of the two defendants "served no useful purpose."

The two men, along with 16 other employees of Hitachi and another Japanese company, Mitsubishi Electric Corp., were charged with stealing IBM documents following an eight-month undercover Federal Bureau of Investigation inquiry [CW, June 28].

Hoffman said Inoue and Keiko are probably the only two defendants the Justice Department will recommend for dismissal.

The cases against nine defendants in Japan remain open, and one defendant in the U.S. is scheduled for trial May 9.

Three other Hitachi employees pleaded guilty in the case, Hoffman said.



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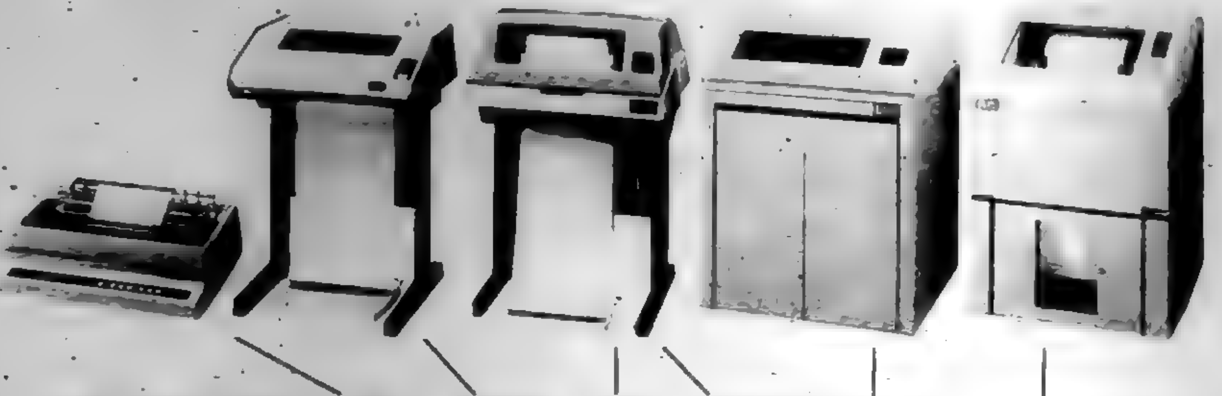

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Presently Confined to DP Pros

Society Seen Next Victim of DP-Induced Stress

By Jeffry Beeler
CW West Coast Bureau

SCOTTSDALE, Ariz. — Information systems managers have the dubious distinction of being in the "vanguard" of a new and little-understood psychological malady — DP-related stress, according to an expert on computing's impact on people.

The ill effects of DP-induced stress are presently confined to full-time computing professionals, clinical psychologist Dr. Thomas McDonald said here last week during a conference on performance management sponsored by Applied Computer Research, Inc., a Phoenix, Ariz.-based publisher of systems-oriented literature. But as systems technology proliferates and becomes increasingly accessible to the man or woman on the street, DP stress will gradually spread until eventually it makes its presence felt in nearly every walk of life.

"Society at large will ultimately have as much experience with computer-related stress as DP managers have right now," McDonald predicted during the conference's March 1 keynote address.

Infant Revolution

From a technical standpoint, today's continuing revolution in systems technology has already met with considerable success. But on the "human" front, the revolution remains very much in its infancy, the president of La Jolla, Calif.-based Transition Associates, Inc. said.

Almost nothing is known at present about exactly how computing affects people. But a recent study conducted by the National Institute of Occupational Safety and Health illuminated the subject at least slightly. The study uncovered evidence suggesting that:

- Among systems professionals, job turnover ranges from 25% to 40% each year.
- Information systems work interferes with the harmonious home life of nearly one in every seven computing specialists.
- The DP profession ranks 12th in the list of the world's 115 most stressful occupations.

"There's a ton of stress in DP," McDonald said. Much of the stress that DPers encounter on the job results from a scarcity of positive feedback, he added. If an application suddenly goes awry, nontechnical end users seldom hesitate to express their displeasure. But rarely, if ever, does either the user community or senior management give corporate computing managers and their employees a pat on the back for a job well done.

In other comments, McDonald reaffirmed the widely held view that nontechnical end users often fear computing and thus resist its introduction in their work places. Some newcomers to DP, especially high-level corporate executives, are apprehensive about automation because they are afraid it may make them seem ignorant or stupid in the eyes of their subordinates, McDonald said.

Others see systems technology as a threat to their job security — a fear that has at least some basis in fact. Still others, meanwhile, oppose automation out of concern that it might disrupt or reorganize the informal personnel networks where much of a typical company's internal business is truly transacted.

To allay these common user misgivings and remove potential stumbling blocks to increased computerization, information systems managers should encourage upper management to involve itself deeply in a firm's DP activities, McDonald advised. One way of securing increased management involvement is for central computing departments to publicize their successes and thus provide a much-needed counterpoint to the endless chorus of user complaints.

"The measure of success in DP is not how much data or how many systems you make available, but how well you provide nontechnical information that intelligent people can use to make informed decisions," McDonald told his listeners.

Basic Standard To Be Reviewed

WASHINGTON, D.C. — The American National Standards Institute has announced that its X3 Information Processing Systems committee has approved a public comment period for the Basic standard.

This period will begin in mid-March and last until mid-July.

Persons interested in reviewing the proposed standard should write to X3 Secretariat, Computer Business Equipment Manufacturers Association, 311 First St. N.W., Washington, D.C. 20001 and ask for document X3J2/82-17, titled "Proposed Draft for American National Standard for Basic." They should enclose a check or money order for $20 for duplicating.

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Major Architectural Firm's Commitment to CAD

By Bill Laberis
CW Staff

NEW YORK — With a few selections from a limited menu on his screen, architect Paul Gold of Skidmore, Owings & Merrill (SOM) moves a bathroom and eliminates a doorway from a set of working drawings. He can almost instantly review the cost ramifications of his design changes. He can also automatically update other drawings with his alterations to make sure he didn't place the bathroom in the path of a freight elevator.

Performed manually — which is the way such work is done at many architectural firms — the manipulations and updates would take Gold several hours to complete. Instead, SOM's commitment to computer-aided design (CAD) enables Gold to "do what they pay me to do around here, namely think."

The company's CAD commitment began 20 years ago with an IBM 1620 and a few simple engineering programs. Today, the voluminous and rapidly expanding data bases of SOM's nine offices are linked via a Digital Equipment Corp. VAX-based network running under DEC's Decnet. The network, supporting over 100 DEC VT100 CRT terminals, Tektronix, Inc. 4113 graphics terminals and an assortment of plotters and printers, gives the firm technical and administrative support capabilities which, according to one SOM partner, "yield a huge competitive edge in what is really a fiercely competitive market out there."

The marriage of CAD techniques with financial management programs at SOM is the glue binding the administrative and design wings to form a more cohesive planning team. And throughout the 20-year evolution of SOM's computer experience, the firm's homegrown software, developed with tools like Informatics General Corp.'s Mark IV, has been the engine of change in providing SOM with computer-aided architectural capabilities it claims are second to none.

"We became proficient in this kind of programming out of necessity because there never was and still isn't much of any applications software commercially available for our specialized purposes," reported Barry Milliken, systems manager in SOM's New York office. "Each software enhancement grew from an actual design problem. In that way just about everything here is solution-based."

Milliken was quick to add that vir-

The Challenge: User Resistance

NEW YORK — "The challenge comes in getting architects who spent years learning to draw and design on drawing boards to sit in front of a terminal and access unseen data bases for a good part of the work. There's a lot of resistance."

Thus, human problems, not technical shortcomings, present the most formidable obstacles to more effective computer applications in architecture or any other business, according to Barry Milliken, systems manager at Skidmore, Owings & Merrill (SOM).

User resistance in the architectural office has several roots, most of which are related to the same implementation problems encountered in any other business setting, Milliken explained. For one thing, the computer used in the design process is totally unforgiving. Where human "fudge factors," however slight, can become part of a manually drafted design, "the computer simply says, 'No, you can't do that because it violates the built-in rules.' "

But on the plus side, computer-aided design (CAD) techniques yield accurate, precise results that do not require the laborious reworking demanded by some manually drawn figures, something architects are fast to appreciate. According to John Winkler, a partner at SOM, it is the younger architects and draftsmen in the office who are more inclined to embrace the newer CAD techniques, because many have been exposed to a light pen and terminal in school.

Just as in the implementation of a general-purpose graphics, business or office automation system, CAD system developers must gain the full support and understanding of upper management — and do so early, Milliken said. Top managers, Milliken maintained in a technical article he is preparing, are "the most likely to be seduced by the hardware itself" because they are the ones who will pay for it. But because "they will probably not be involved in evaluating the operating details of the system, they are also most likely to overestimate and be oversold on its capabilities," he warned.

To ensure coordination of computer purchases and operations at SOM's nine offices and to plan for an orderly expansion of shared data bases, a committee of three senior partners meets about once a month to develop long-range data processing planning and review equipment needs.

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Grows as It Ties Nine Offices Into Data Bases

The computer-generated drawing for the Jeddah International Airport terminal in Saudi Arabia is the product of several data bases stored in Skidmore, Owings & Merrill's growing electronic files. The finished version of the tent-like structure, which shelters pilgrims en route to Mecca, is above.

tually every design and management function now facilitated by the DEC-based system can be done by hand. But the computer-aided designs and solids modeling programs are more accurate, more easily read in the field and much cheaper to alter if you have good software, he said.

"Our people think more imaginatively because we can pull them away from routine and drudgery," said Don Smith, a design partner at SOM. "They can look at computer-generated drawings and see awkward conditions they might have missed otherwise. Then they cope with them with unmatched speed and accuracy."

For example, one program consists of stick figure drawings of the skylines of several U.S. cities. When SOM sketches out a proposed building, designers use this data base to determine its impact on traffic flow and to assess the building's shadowing effects on surrounding structures. SOM coordinates these measurements with another data base storing a complete set of New York zoning ordinances and building codes.

Other stored programs enable designers to manipulate functionally the placement of office furniture and partitions in design drawings, while cross-checking furniture outlays with catalog-like data bases ensures that the designs stay within the client's budget.

SOM's technical staff also utilizes its computer facilities as a marketing tool, creating computer-generated movies for client presentations. "For our clients there's more than a little fascination to it all, but these presentations make it relatively easy for them to see what they're getting and to make certain design changes happen right before their eyes with no waiting," SOM's Smith said.

But it is in the changing nature of architecture that Smith sees the greatest potential for computerized design and planning. "There's a whole new movement where buildings are getting more and more complex, with each floor, even in large buildings, different from the next," he said. "Our expanding data bases will help us investigate new possibilities and snuff out potential problems long before construction starts. In many ways, we're still in the pioneering stages."

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Unlike Prime Users

This User Group Tied Tightly to Its Vendor

By Susan Blakeney
CW Staff

WELLESLEY, Mass. — Unlike the Prime Users Group (PUG), the North Eastern System/38 Users Group (Nestu) is small and very young. It is also completely self-funded and quite enthusiastic. Its members' excitement over the IBM System/38 is exceeded only by their excitement over the users group itself.

But Nestu is unlike PUG in another way. PUG's members recently struck a blow for independence from their vendor, Prime Computer, Inc. [CW, Feb. 28]. Nestu remains tied tightly to IBM's corporate apron strings.

Even though the group is funded by its 267 member companies rather than by IBM, its speakers come mainly from IBM. Because the speakers strongly discourage press coverage and because Nestu members often rely on IBM's participation at their meetings, there has been no news coverage of Nestu meetings.

The focus of one recent Nestu monthly meeting here, for example, was "System/38 Journal Management," an IBM software system that records changes to data base files. Not only did the group shy away from having its proceedings reported in the general press, the local IBM specialist who addressed the group asked that his name not be published when approached by a *Computerworld* reporter.

Nestu also has a policy forbidding its members, some of whom are in computer-related businesses, from pushing their respective company's products or services at user meetings.

"Soliciting is outlawed in our bylaws," noted Bill Betrone, a systems analyst at Para Research, Inc. of Rockport, Mass., who is also president and founder of Nestu. But, he admitted, "it's still going to happen and it has happened."

Betrone started Nestu last April because he was frustrated with the level of service he was getting from the IBM systems engineering staff. He wanted more and decided to look for help and input from other System/38 users and also to "share whatever I knew."

Recalling Nestu's first gathering, Betrone said, "I told the group to ask themselves this question: Why do you think there are user groups? Is it because the products are so great? Or is it because the products are so intensely complex?"

Whatever the answer, Bill Tansi, manager of software development at Para Research, believes Nestu provides him with "a lot of good food for thought."

Tansi is impressed by his fellow members' level of understanding of System/38 and more importantly by "their desire to understand even more."

Not Social Meetings

Furthermore, Tansi noted that Nestu meetings are "not social-club-type gatherings ... the topics and lectures are very good."

Jenny Misiaszek, assistant manager of data processing at Holmes Transportation, Inc. in Framingham, Mass., concurred: "I've always stayed away from user groups because they were like social events. But this is not true of Nestu.

"Maybe its because of the nature of the equipment," Misiaszek offered, referring to the relative newness of the System/38. "You learn something at every meeting ... if not from the speakers, from the other members."

Misiaszek said she was "bored by Guide [an IBM small systems user group] meetings except when new equipment came out — then it was a fantastic place to learn ...

"I think Nestu is serving a great function," she continued. "We're in a continual learning process with the System/38. Eventually, when you get to know about 95% of the computer, user groups have a tendency to change," she theorized. But for the time being, "This user group is different from the rest."

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'As exasperating as it can be for computer professionals' that it will be two to three years before they see a consensus in judgments handed down in computer-related cases, 'the truth is, the process is accelerating.'

Harvard Law's Arthur Miller Eyes Consensus on DP Law

By Patricia Keefe
CW Staff

CAMBRIDGE, Mass. — He's a Harvard Law School professor and the energetic host of a weekly television show that probes controversial legal topics. He thinks it will take a while before the courts get a handle on high-tech issues.

But not that long a while. Although it took the courts 20 to 50 years to work out their handling of such new phenomena as automobiles, Arthur Miller expects a much shorter "fumbling around" period with computers because of economics and the dramatic impact that technology is having on people.

While Miller predicts it may take two to three years before computer professionals can expect to see any consensus in judgments handed down in computer-related cases, the computer industry can take heart. "As exasperating as it can be for computer professionals, the truth is, the process is accelerating."

Miller cited the exposure of judges and lawyers to computerized legal systems such as Mead Data Central, Inc.'s Lexis and American Jacquard Systems, Inc.'s Westlaw as one reason. A way to accelerate the process even more is for computer professionals to design a code of ethics to which the courts can look and from which the courts can borrow. "It is very helpful to have a code of professional responsibilities because it creates a reactive instrument," he explained.

Increasingly, law schools are exposing their students to computers, Miller noted. He himself plans to offer a nontechnical course on the information industry within the next two years.

While federal and state lawmakers are "competent" to handle high-tech issues, Miller said, "lawmakers require a great deal of education. I think they realize that high-technology assessment and policymaking is a high priority, and that it is important that they be able to learn what they have to."

The hearing process that follows the introduction of new bills can be an educational forum for lawmakers and give the affected parties an opportunity to provide relevant education via their presentations to congressional committees, he added.

Despite his emphasis on education, Miller was quick to stress that the current legal structure is capable of handling computer-related crime. But while it is "not important to have new principles enunciated that are unique to high-tech issues," this does not mean laws specifically related to computer crime should not be passed.

Passage of computer-specific legislation "would help by cutting the mumbo-jumbo metaphysics, [for example], whether theft statutes apply to information, and prevent lawyers from playing their little games. And it would have a tendency toward a psychological factor to say, for example, 'There is no doubt that stealing from computers is like stealing from humans,' " Miller explained.

Surveillance 'Frightening'

CAMBRIDGE, Mass. — Government surveillance via computers is "frightening" because most victims are unaware that it is happening, Harvard Law School Prof. Arthur Miller said in a recent interview.

"Government surveillance is a part of American life. Surveillance by computers is just another way of doing it," Miller said. Court challenges have not been successful because "the right cases haven't come along."

To combat the threat of surveillance, more public awareness is needed. Public reaction to government spying during the '60s and early '70s resulted in limitations on Federal Bureau of Investigation and Central Intelligence Agency activities. In the Reagan administration, however, the pendulum is swinging back, Miller said.

What happens to information about people, once gathered, is another area of concern to Miller. "The manila folder just doesn't travel as far as the computer entry," he observed.

Precedent-setting court cases will come in time, according to Miller. In a case in which someone has been wronged because an institution failed to safeguard properly its data, the issue would be whether a normal, reasonable duty exists to safeguard data. And the day the decision comes down, all systems worth their salt will upgrade their security to ensure their survival, the Harvard Law School professor said.

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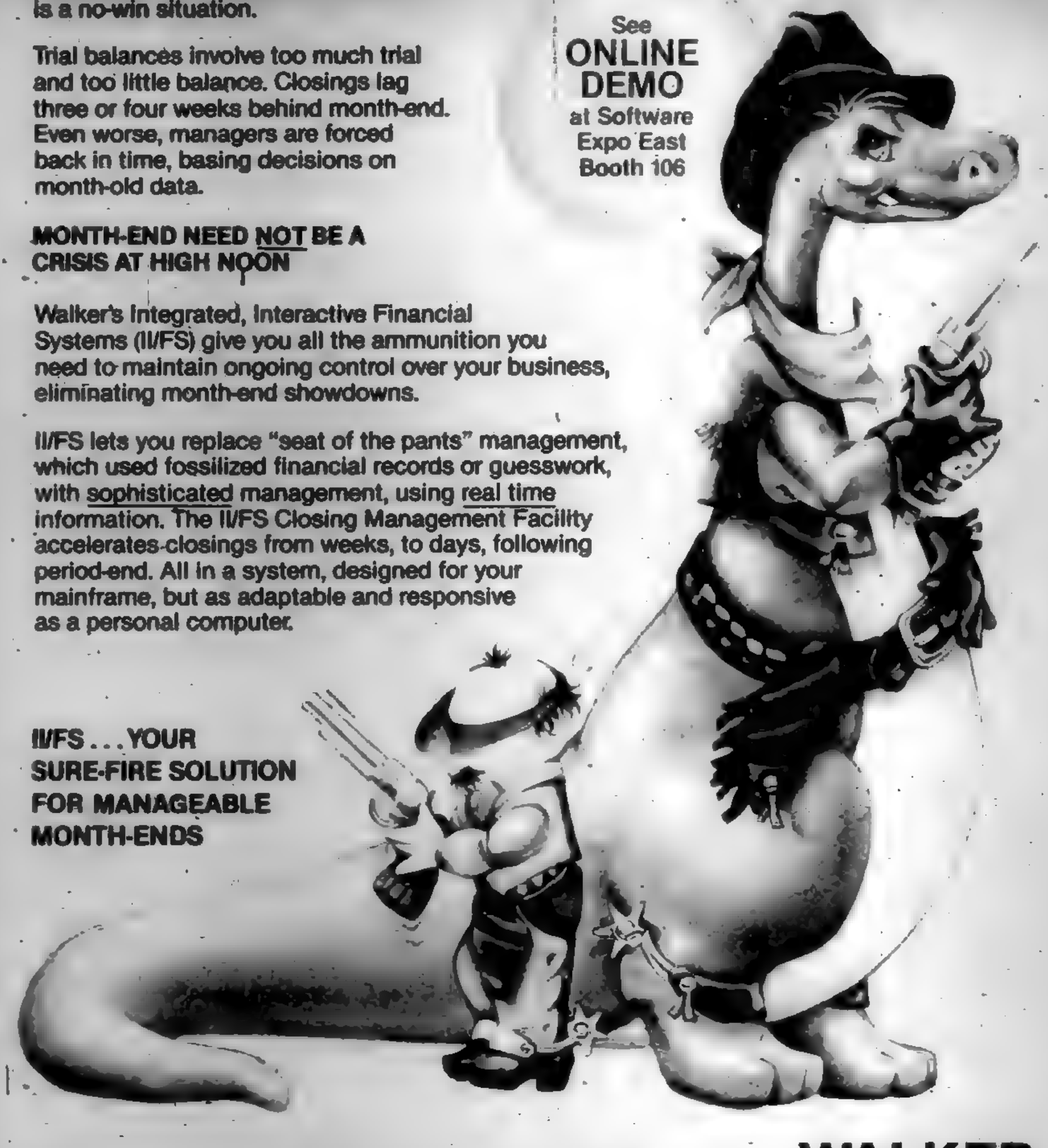

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Vendor Panel Explains OA Solutions

By Jim Bartimo
CW Staff

PHILADELPHIA — Different groups within the office have different needs. Three vendors were asked to explain how their communications-oriented products filled those needs at a session on OA architectures here at the recent Office Automation Conference (OAC '83).

"Wang [Laboratories, Inc.'s] solution is: each according to their needs," explained Peter Thornton, senior product manager of networking. "Different groups have different problems and one solution is the cable bus, broadband Wangnet. The benefits of [a broadband network] are that everything happens concurrently on the same wire."

"The problem we're all working on is to improve productivity and responsiveness in the office. The goal is to tie managers, executives and secretaries together," according to John F. Shoch, vice-president of the Office System Division at Xerox Corp.

Four Approaches

There are four approaches to tying the office together, Shoch said. One is the centralized data processing approach in which all functions eventually trace back to a host computer. Another is the use of a private branch exchange as the center of the office — tying all functions through the existing telephone network.

A third method is to give all office workers their own stand-alone personal computers; however, this does not allow them to share resources, Shoch observed. The fourth method is a distributed architecture of powerful workstations tied together in a high-speed local network. "This, of course, is our method," he said.

Because the office is a multifunction environment, an office system must also be multifunction, Steen said. Achieving full integration of these functions "is probably more complex than any computer problem we've had," he noted.

Finally, Bob Steen, director of architecture and telecommunications for IBM, said that IBM's approach to filling these needs involves its Systems Network Architecture, which offers physical interconnection, logical means of communicating, application-level compatibility, systems integration through protocol conversion and a friendly user interface.

Resource Sharing Seen Crucial to Future Nets

By Bruce Hoard
CW Staff

PHILADELPHIA — Resource sharing — especially between local-, metropolitan- and wide-area networks — is crucial to the success of integrated communications networks of the future, Walter G. Fredrickson said at the recent Office Automation Conference (OAC '83) here.

"We can no longer simply think about text and data," he declared, adding that other applications such as image and voice must also be provided. Office needs have grown beyond merely wanting computing power and word processing. Office workers want integration, he said.

Frederickson, vice-president of technology within Harris Corp.'s Word Processing Division, used the OAC pulpit to describe each component of an integrated communications network. The conference was sponsored by the American Federation of Information Processing Societies, Inc..

He claimed a dichotomy exists between users, who want reliability, backups and low costs, and designers, who worry about topology, throughput and response time.

Need for PBX

Citing Yankee Group figures, Fredrickson pointed out that up to 70% of Fortune 500 companies employ mainframe computers somewhere in the organization. This fact and the "dramatic growth" of distributed data processing have led to the need for private branch exchanges (PBX), gateways and nodal processors, he said. These communications technologies require network architectures such as IBM's Systems Network Architecture and Digital Equipment Corp.'s Decnet, he observed.

Fredrickson also stressed the importance of communications standards. He said efforts by the International Standards Organization to establish its layered Open Systems Interconnection architecture are laudable. It is necessary to connect heterogeneous networks consisting of different vendors' devices, according to Fredrickson.

Fredrickson said the need for local-area networks developed after the stand-alone computing environment of the '60s gave way to increasing use of computers in departments during the '70s.

By the '80s, there was a demand to bring computing power closer to the point of use, he said. Now users want to take information, manipulate it and move it to other users. They want an information appliance, a multipurpose workstation that plugs into a wall, he claimed.

The local-area network environment is favorable for development now because traditional communications restraints such as poor atmospheric conditions are not applicable in the local environment. Furthermore, there is plenty of bandwidth available and line-access schemes are relatively easy to use, Fredrickson said.

Switch and access — or metropolitan-area networks, as they are more commonly known — represent the next step out from local-area networks. Fredrickson said they are commonly accessed through a tandem switch — that is, data and voice from the local network is transmitted through a PBX via least cost routing to a microwave, fiber-optic, satellite or other systems.

The next and last step toward the integrated communications network is the wide-area network. Again, there is a choice, Fredrickson said. Users can use public long-haul lines or go with a private satellite or microwave system. "The satellite networks have proved to be extremely cost-effective," he said.

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Speaker Outlines OA Implementation Strategy

By Jim Bartimo
CW Staff

PHILADELPHIA — The most important factors in implementing a successful office system are support from top management, a long-range corporate strategy and a well-planned pilot project, according to Susen S. Kay, senior consultant at Hannagan and Associates of Chicago.

Speaking here at the recent Office Automation Conference (OAC '83), sponsored by the American Federation of Information Processing Societies, Inc. (Afips), Kay made her comments at a session titled "Strategic Planning and Implementation Issues."

"Top management is interested in only two things: profitability and success," Kay said. "They want to make a big splash." Factors that influence senior management to accept office automation are an overload of paper, demands on their own time and a reluctance to trust the corporate DP department.

An office automation manager or project leader should ensure that he has the support of at least one member of senior management, and he should think of that person as a sponsor. This sponsor will help the office automation project by praising it to his peers, Kay said, which will help the manager maintain his mandate.

When developing an office automation strategy, the manager should consider user needs first and technology second. "Too often, office automation is based on the existing technology," she said. "This will not get your project legitimized."

Pointing out that a strategy should see the manager through to implementation, Kay said there are a number of guidelines to keep in mind. The plan should include an integrated office system that incorporates whatever capabilities are needed, such as voice, data, text and image. Second, the planner should be sure he designs an office system that serves the needs of executives, middle management and secretaries alike.

Perhaps most importantly, the strategy must consider the needs of the entire corporation, not just the department that will be automated first. "Office automation, like data processing, will eventually become a corporate system," Kay said.

Kay pointed out that the term "pilot project" has a different meaning in the office than it does in DP. "The purpose of an office automation pilot project is not to test the system [as in DP] — it's for the benefit of the users."

The key aspect of a successful pilot project is selecting the right department as the test site. "Spend a lot of time choosing the pilot site," Kay advised. "I've spent half a day to a full day helping my clients decide which department should be used."

Once the pilot project is in place, the manager should not only help the users with the currently installed equipment, but encourage them to grow into more sophisticated applications.

MPG Meeting Set for May 11

CHICAGO — The 8th Annual Mathematica Products Group (MPG) Roundtable Meeting, for users of Mathematica Products Group, Inc. software, is slated to take place here May 11-13.

Five plenary sessions are scheduled in addition to 36 user presentations and 24 workshops. Six sessions addressing new products are on the agenda.

Early registration for the event costs $350. Additional information can be obtained from Jonathan Smith through MPG, P.O. Box 2392, Princeton, N.J. 08540.

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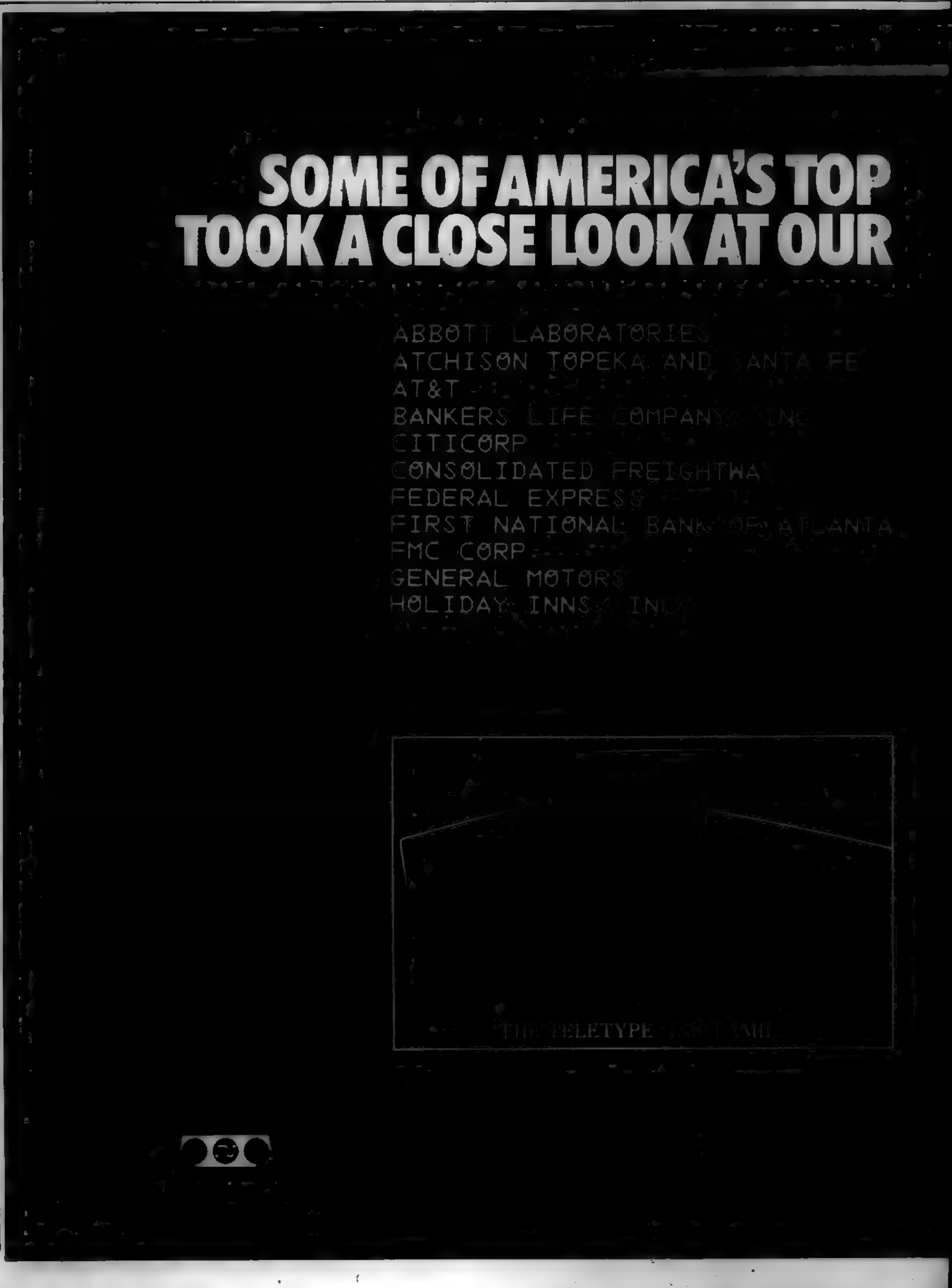

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Marketing Rep Warns Micro Buyers to Beware

By Bruce Hoard
CW Staff

PHILADELPHIA — The personal computer selection process should be carefully planned and meticulously executed, Barbara D. Stendal, product marketing representative with Ryan-McFarland Corp., told a session here at the recent Office Automation Conference (OAC '83), sponsored by the American Federation of Information Processing Societies, Inc.

Stendal walked attendees through the process she had traveled in deciding on and then purchasing personal computers, but first warned that a personal computer may not be the right piece of hardware for their needs. She also said potential buyers should distinguish between good personal computers and good marketing pitches. One way to do that is to ask all sales representatives the same questions.

Stendal's company was looking for a way to handle 50,000 to 70,000 daily accounts receivable transactions. There was a need to move the point of data entry into the client's stores.

The expected payoffs were a reduction of manual labor, lower operating costs and three to five fewer days of processing time. The requirements for a solution included the placement of the data entry in the store, a sturdy piece of hardware that could withstand precipitous temperature changes, credit authorization capabilities and enough storage capacity to save transactions until it was economically feasible to make data calls to a computer.

When the search for a solution began, Stendal did not know if personal computers were the answer. Ryan-McFarland also considered 10-key credit terminals, but passed on them because they lacked communications capabilities. Dumb CRT terminals were dismissed because they lacked sufficient storage capacity.

Although the initial outlay for micros was high, they fulfilled all the basic requirements and Ryan-McFarland decided to go with them. To determine which one was best, it used an evaluation matrix.

Reliability Most Important

"Our most important criterion was reliability," Stendal said. Looking into possible future repair situations, she discovered the full service contract, which charges a high monthly fee whether or not repairs are done. She finally settled on a time and materials-based service contract.

Noting that one major vendor has 16 repair centers nationwide while another has more than 2,000, Stendal said that personal computer purchasers should take shipping costs into account and make sure they can just ship the part or parts that require repair.

One vendor was willing to ship and install its personal computers anywhere in the U.S., while others charged shipping and installation fees. One vendor required her to instruct remote users on how to assemble their micros over the phone; another offered a machine that slipped out of its box and plugged into the wall. "Everybody claimed installation would be very easy," Stendal declared. "There really is a wide range of ease of installation."

In looking at warranties, she found that they ran between 30 and 90 days.

Ease of programming was also important to Stendal's company. She did not want her Cobol-trained programmers to have to learn a new language. "That was overhead we didn't want to pay for," she said.

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Cincinnati	April 12	Kansas City	April 27	Rochester	April 7
Cleveland	March 17	Los Angeles	April 5	St. Louis	April 28
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Budget Cuts Force Louisiana to Cancel Personnel System

By Susan Blakeney
CW Staff

BATON ROUGE, La. — The state of Louisiana is canceling a $7 million consulting contract to develop a centralized state personnel system because of severe budget cuts. The system would not have been compatible with the state's network of IBM processors.

Arthur Andersen & Co. was working on software for a Personnel Management Compensation System for Louisiana's Division of Administration and the Department of Civil Service. The program was to run on the division's leased Honeywell, Inc. computers.

But the state took a closer look at the consulting contract when the budget ax fell late last year. It realized that the Honeywell-based system would probably never be able to communicate with the state's IBM and IBM plug-compatible equipment.

"We've decided to change our direction and streamline operations," explained Len Sanderson, assistant commissioner of administration for the state of Louisiana.

"We decided to position ourselves so that we can better communicate. Plus, there's more IBM-compatible software to choose from," he said.

Louisiana's Honeywell equipment has "long been a bone of contention" among other state agencies because of its incompatibility with their IBM installations, according to Sanderson.

"We kept waiting for this 'magic box' that was supposed to allow our machines to talk to each other . . . and it never came," he said.

State programs now running on the leased Honeywell equipment will be frozen, Sanderson said, and the IBM migration will be launched.

"We're going to reorganize the information office within all state offices. We're coming to a recognition that data processing, telecommunications and office automation have to be hooked together somehow, and that's what we're trying to accomplish," Sanderson said.

He added that the cancellation of the contract had nothing to do with any deficiency on the part of Arthur Andersen, which has already collected some $500,000 in consulting fees from the state.

"They did their job," Sanderson said. "They developed the program for an automated and integrated system. We just had to change our direction."

Sanderson reported that the state's new, scaled-down data processing plan calling for IBM equipment will cost the state roughly $3 million.

Town Receives B1995, Then Puts Out for New Bids

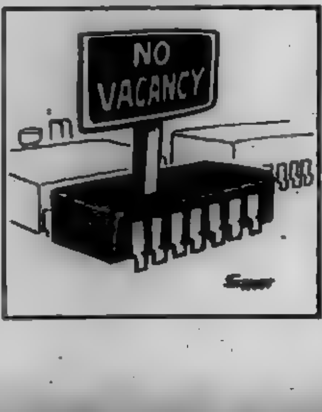
NORTH BERGEN, N.J. — Public bids are now being accepted by this town for a new computer system, although it recently received a Burroughs Corp. B1995.

The bids are being accepted because the town's Board of Commissioners learned that the Burroughs machine had been ordered before the required 10 days of bidding was allowed.

According to Finance Commissioner Charles Haas, the computer was ordered to expand the township's existing Burroughs B800-based Data Processing Department. After conducting an informal evaluation of industry equipment himself, Haas said he picked the Burroughs system because Burroughs told him its B1995 system was the only computer on the market that could be used with the town's B800 system and related software.

New bids, due March 8, will be evaluated by the purchasing and data processing departments on the basis of the town's needs. Haas does not know if the town will just keep the B1995, which is still in its box, but described the system as "what we want."

Haas also denied allegations that he committed any bidding violation, and does not feel there's been any foul play on the part of Burroughs. He said the existing software is all Burroughs-compatible, and does not feel another vendor could fulfill his needs any cheaper.



Consultant Profiles Typical Computer Felon

By Jim Bartimo
CW Staff

DEDHAM, Mass. — A computer felon is usually between the ages of 18 and 40, male — and a nice guy.

According to the U.S. Justice and Treasury Departments' profile of a computer felon, he is also aggressive, trusted, has no prior criminal record and usually works alone, consultant John R. Maples told a recent Northeastern University seminar on "Industrial Espionage in High Technology" here.

Maples, who is senior vice-president of operations and training for Special Security International Corp. of Roanoke, Va., spoke about computer security from the corporate security director's point of view.

Background Check

Because the computer felon often cracks the computer system out of financial need, Maples suggested that a thorough background check be performed on all data processing professionals, including a check on their credit rating.

He identified four ways in which the computer felon is likely to strike:

- Physically. "This ranges from actual vandalism and damage to equipment, to information destruction, falsified entry and fraudulent use of data." As an example, Maples pointed to a group of New York high school students who used a classroom terminal to dial into a Canadian corporate data system.
- Transactionally, by tapping into a computer system under the auspices of a legitimate user, usually to divert funds electronically.
- Via programming, by altering a computer program to gain computer time or data or to divert funds. Maples cited the recent theft of $21.3 million from the Wells Fargo bank engineered by two bank employees and a sports promoter.
- Electronically. "This ranges from illegal use of a personal computer system to access classified data of a business to wiretapping of communication lines to obtain proprietary information or divert funds."

There are times when a company should fear not only individual criminals, but competing companies. "People think that only product information is in danger, but so is marketing and personnel information," Maples explained to the attendees at the seminar.

Maples gave the example of one DP professional who printed out employees' resumes for sale to a headhunter.

Leaving software security to DP professionals, Maples suggested that hardware can be secured best by a multilevel system — posting obstacles outside the building, outside the computer room and at the equipment itself.

"Card-key security is probably the best thing going today," Maples said, pointing out that the more expensive fingerprint identification system has roughly a 6% error rate in both preventing authorized personnel from entering the computer room and allowing unauthorized personnel into that area.

Security Expert Categorizes Industrial Spies

DEDHAM, Mass. — "Most countries spend more money trying to get our technology than they spend developing their own," George Van de Water, senior Western representative of a security consulting firm, charged here recently.

Speaking at Northeastern University's seminar on "Industrial Espionage in High Technology," Van de Water said that California's Silicon Valley alone lost $20 million through industrial espionage. He also claimed that 40% of all Eastern bloc personnel in the U.S. working as diplomats and journalists are actually skilled espionage agents.

Threats to high-tech industries come from both the Eastern countries and "friendly competitors," such as Japan, said Van de Water, who is with Special Security International Corp. based in Roanoke, Va. He pointed to IBM's recent espionage episode as an example.

According to Van de Water, there are three categories of industrial spies: opportunists, who do not actually perform any espionage but tell professional agents about high-tech personnel who might be likely candidates to turn over industrial secrets; semiprofessionals, who are often used by smaller businesses and are often private detectives; and professionals, who are seldom caught and make their livelihoods by extracting information from one company and providing it to another, usually outside the U.S.

It is difficult to determine if high-tech espionage is on the rise because good spies are not caught and the majority of discovered cases go unreported, saving a company from embarrassment and the possible loss of government contracts, Van de Water said. "Information leaks become better guarded than the information that was lost," he commented.

"Security is like insurance," Van de Water continued. "It's too expensive until you need it and then it's too late."

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Calendar

Week of March 13

March 17-18, Dallas — **Local Networks: Promise Into Practice.** Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55424.

Week of March 20

March 21, Columbus, Ohio — **DOS/VS Job Management.** Contact: Goal Systems International, 5455 N. High St., Columbus, Ohio 43214.

March 21-22, Hartford, Conn. — **Testing in the Cobol Environment.** Contact: New England Data Services, P.O. Box 92, Guilford, Conn. 06437.

March 21-22, San Francisco — **Computer Litigation: Resolving Computer Related Disputes and Protecting Proprietary Rights.** Contact: Practicing Law Institute, 810 Seventh Ave., New York, N.Y. 10019.

March 21-23, San Francisco — **Improving Office Productivity: Principles and Practices.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 21-23, Washington, D.C. — **Word Processing Systems: Planning, Design and Programming.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 21-23, San Francisco — **Financial Information Systems.** Contact: National Institute for Management Research, P.O. Box 3727, Santa Monica, Calif. 90403.

March 21-23, Zurich, Switzerland — **International Symposium on the Performance of Computer-Communications Systems.** Contact: IBM Zurich Research Laboratory, Saumerstrasse 4, CH-8803, Ruschliken, Switzerland.

March 21-23, Toronto — **MVS Systems Management.** Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

March 21-23, San Francisco — **Financial Information Systems.** Contact: National Institute for Management Research, Department D, P.O. Box 3727, Santa Monica, Calif. 90403.

March 21-25, Cambridge, Mass. — **C Programming Workshop.** Contact: Institute for Advanced Professional Studies, 55 Wheeler St., Cambridge, Mass. 02138.

March 21-25, San Diego — **Auditing in the Contemporary Computer Environment.** Contact: Marge Umlor, EDP Auditors Foundation, 373 S. Schmale Road, Carol Stream, Ill. 60187.

March 21-25, Dallas — **Managing the Audit of Computer-Based Bank Systems.** Contact: Bank Administration Institute, P.O. Box 93879, Chicago, Ill. 60673.

March 21-25, Buffalo, N.Y. — **Basic Systems Analysis.** Contact: Association for Systems Management, International Headquarters, 24587 Bagley Road, Cleveland, Ohio 44130.

March 21-25, Washington, D.C. — **How to Increase the Productivity of Computer People.** Contact: Keston Associates, 11317 Old Club Road, Rockville, Md. 20852.

March 21-25, Boston — **Information Engineering Revolution.** Contact: Susan Johnson, Information Methods, Inc., 504 Totten Pond Road, Waltham, Mass. 02154.

March 21-25, Los Angeles — **IMS/VS Data Base Design.** Contact: Data Base Management, Inc., 1075 Tolland Tnpk., Manchester, Conn. 06040.

March 21-25, Boston — **Information Engineering Revolution.** Contact: Information Methods, Inc., 504 Totten Pond Road, Waltham, Mass. 02154.

March 22-23, Zurich, Switzerland — **Office Automation Conference and Exposition.** Contact: U.S. Department of Commerce, P.O. Box 1065, 3001 Bern, Switzerland.

March 22-23, Washington, D.C. — **Factory of the Future.** Contact: Center for Manufacturing Technology, 4170 Crossgate Drive, Cincinnati, Ohio 45236.

March 22-24, Washington, D.C. — **Federal ADP Software Conference.** Contact: National Institute for Management Research, P.O. Box 3727, Santa Monica, Calif. 90403.

March 22-25, Los Angeles — **Designing VLSI.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

March 22-25, Orlando, Fla. — Techex '83 — **World Fair for Technology Exchange.** Contact: Dr. Dvorkovitz & Associates, P.O. Box 1748, Ormond Beach, Fla. 32075.

March 22-25, Washington, D.C. — **Embedded Computer Systems.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

March 22-25, Boston — **Real Time System Design for 8- and 16-bit Microprocessors.** Contact: Integrated Computer Systems, 3304 Pico Blvd.,

(Continued on Page 28)

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Seminar Set On CAD/CAM

CAMBRIDGE, Mass. — Arthur D. Little, Inc. will hold a one-day seminar on computer-aided design and manufacturing (CAD/CAM) titled "Beyond CAD/CAM: Forging the Factory of the Future Through Computer Integrated Manufacturing" in four cities during March.

Seminars are scheduled for Boston, March 17; Los Angeles, March 21; Houston, March 23 and Atlanta, March 25.

The seminar costs $500 with a half-price discount for a second member from the same company. Arthur D. Little is located at Acorn Park, Cambridge, Mass. 02140.

Lowell to Speak At TCA Show

PHOENIX — Former *Apollo* astronaut James A. Lovell will be featured as the keynote speaker at the Communications Roundup telecommunications show, being conducted here by the Tele-Communications Association (TCA) April 11-13.

Lovell commanded the *Apollo* moon mission during the *Apollo* 13 flight. Now retired from active U.S. Navy service, he serves as senior vice-president of administration at Centel Corp.

Registration for the TCA conference is $50 for members and $100 for others. Further details are available from the association, located at Suite 333, 3500 N. Central Ave., Phoenix, Ariz. 85012.

Martin to Speak At Info Meet

WASHINGTON, D.C. — Industry guru James Martin will be the keynote speaker at the Information Engineering Conference which will be sponsored here March 16 by Applied Data Research, Inc. (ADR) and Database Design, Inc., Martin will discuss the corporate data model as a basis for productivity.

Other topics include developing a corporate data resource, creating a broad base of information users and accelerating application development.

The conference is free to ADR/Datacom customers and prospective customers on a first-come basis. ADR is located at Rt. 206 and Orchard Road, CN-8, Princeton, N.J. 08540.

DP's Effects On Humans Topic of Meet

TALLAHASSEE, Fla. — A conference studying the human effects of the computer age will be held by Florida State University (FSU) here March 14-15.

"The Third Hemisphere" will address topics including "The Human Mind: a Perspective on Human Capabilities," "Social Change in the Computer Revolution" and "The Question of Artificial Intelligence."

Privacy in the computer age will be a theme of the conference. A panel discussion will include representatives of the American Civil Liberties Union, the Florida Attorney General's Office, the Credit Bureau of Tallahassee, the League of Women Voters and the national news media.

Registration for the two-day conference is $15. Hotel rooms are available at a group rate from the Tallahassee Hilton.

More information can be obtained from the Center for Professional Development and Public Service, Florida State Conference Center, FSU, Tallahassee, Fla. 32306.

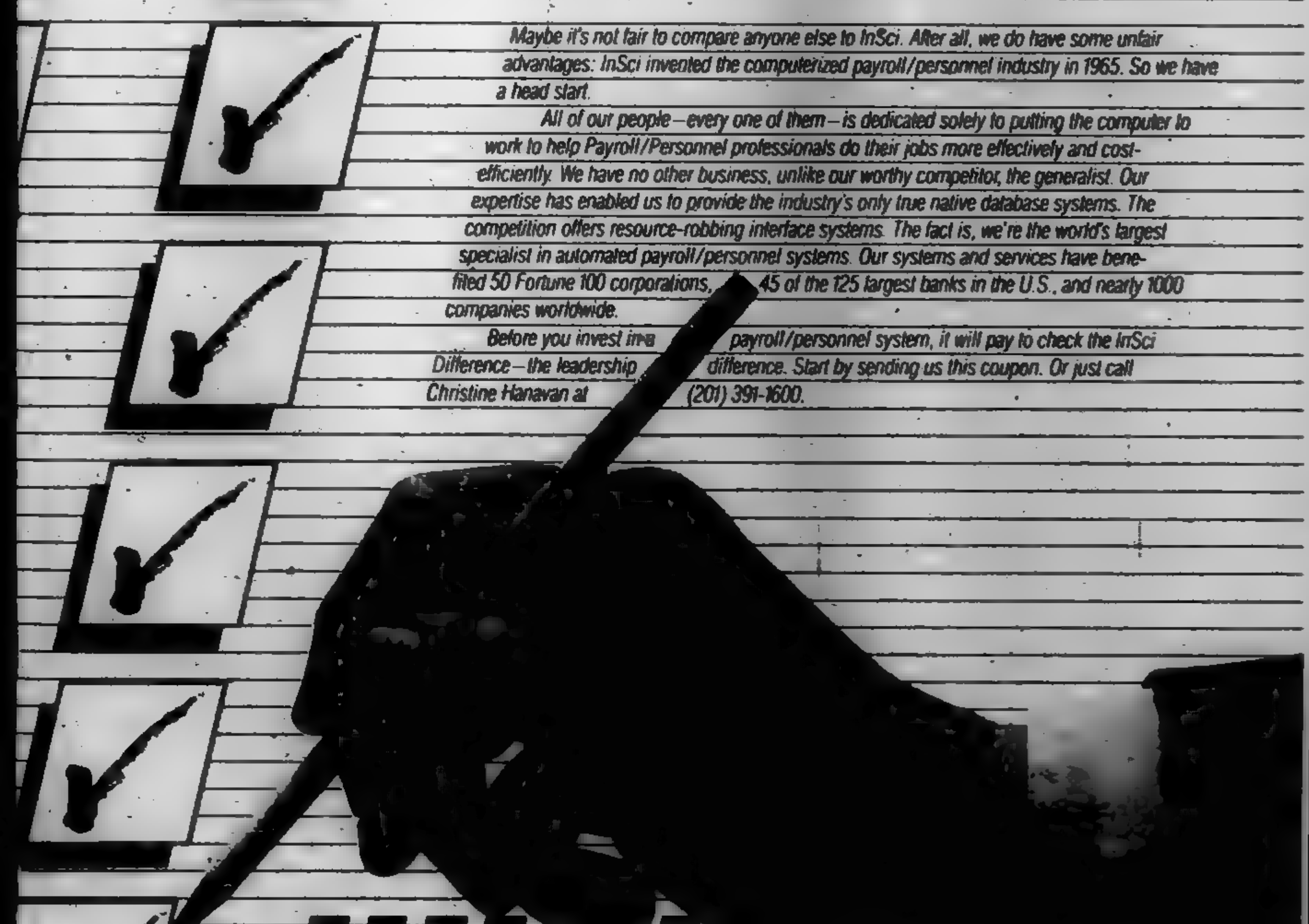
Honeywell Gives Futurist Awards

MINNEAPOLIS — Honeywell, Inc. has announced the 10 winners of its nationwide college student Futurist Awards Competition.

The winners are William Graham of the University of Pennsylvania, Michael Isnardi of MIT, Philippe Byrnes of the University of Illinois, Dana Iketani of the University of California, Stacey Thompson of Purdue University, Victor Riley of the University of Arizona, Anthony So of the University of Michigan, Robert Bruns of the University of Colorado, Henry Gerber of Iowa State University and Michael Palmer of the University of Illinois.

The students were asked to write an essay predicting what the year 2000 would hold for four of six areas of technology, then write a fifth piece explaining what impact their predictions would have on society. One student anticipates marine-based petroleum synthesis, linear-space vehicle accelerators and an inter-revolution of computers in the year 2000, according to a Honeywell spokesman.

Each winner will receive a $2,000 prize. Those students majoring in electrical, computer or mechanical engineering or computer science will be offered summer internships with Honeywell.



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Calendar

(Continued from Page 26)

P.O. Box 5339, Santa Monica, Calif. 90405.

March 22-25, San Diego — **Computerized Robots.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

March 23-25, Chicago — **DP Quality Assurance: Putting It All Together.** Contact: U.S. Professional Development Institute, Department ABCD, 12611 Davan Drive, Silver Spring, Md. 20904.

March 23-25, Hartford, Conn. — **Network Communication Protocols.** Contact: Center for Advanced Professional Education, Inc., 11928 N. Earlham, Orange, Calif. 92869.

March 23-25, Troy, Mich. — **OA — From Tee to Green.** Contact: Data Processing Management Association, Education Foundation, 14536 Island Drive, Sterling Heights, Mich. 48078.

March 23-25, Columbus, Ohio — **VM Structure, Flow and Tuning.** Contact: Goal Systems International, 5455 N. High St., Columbus, Ohio 43214.

March 23-25, Denver — **Local-Area Networks.** Contact: Mary Willard, The Seminar Broker, 3212 W. 133 Ave., Broomfield, Colo. 80020.

March 23-25, San Francisco — **Structured Systems: Analysis, Design and Operations.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 23-25, Houston — **Micro Systems: A Guide to Selection.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 23-25, Cary, S.C. — **Analysis of Unbalanced Data Using GLM Course.** Contact: SAS Institute, P.O. Box 8000, Cary, N.C. 27511.

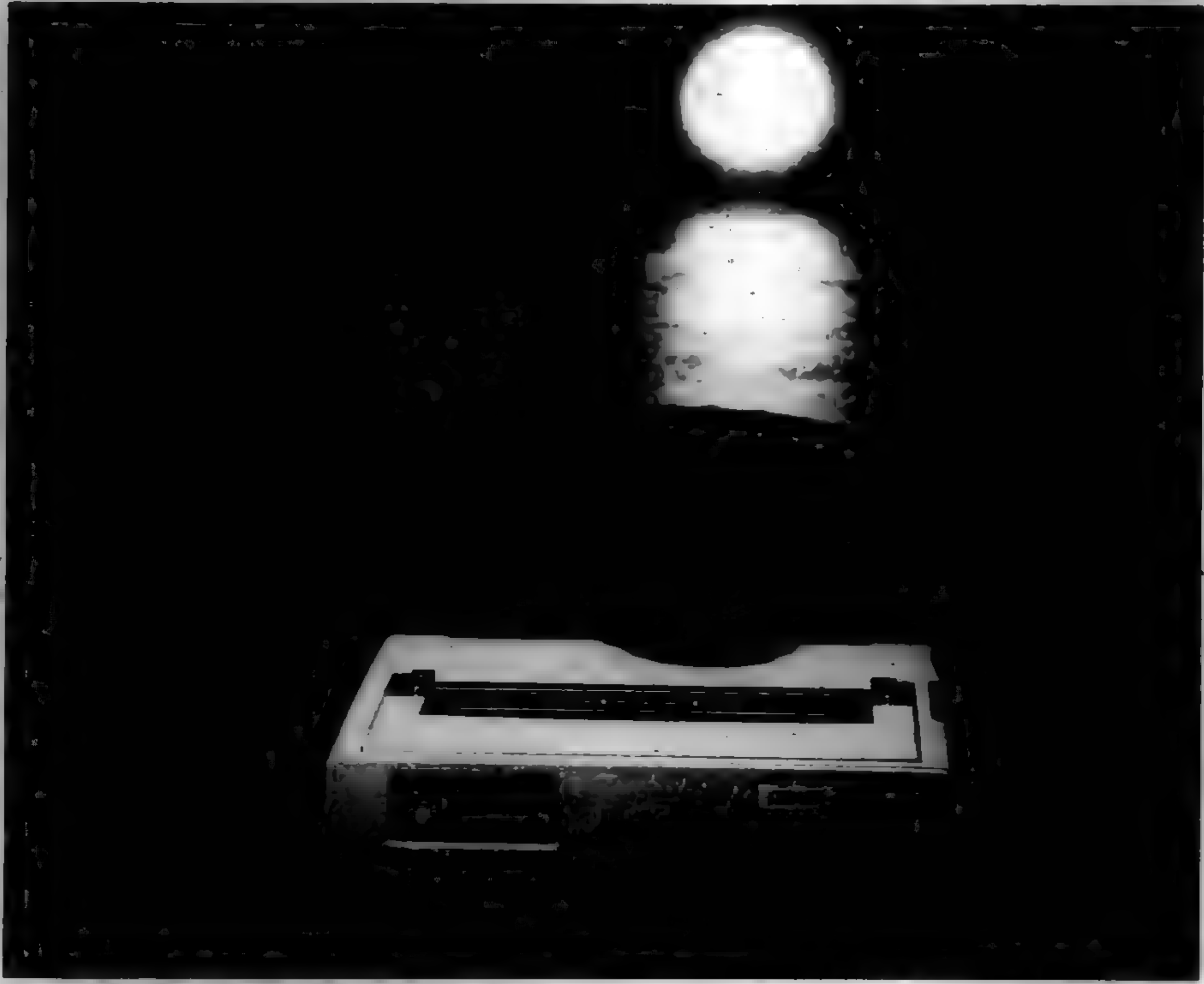
March 24, Scottsdale, Ariz. — **Economics of VLSI Procurement.** Contact: DM Data, Inc., Suite 700, 6900 E. Camelback Road, Scottsdale, Ariz. 85251.

March 24-25, Orlando, Fla. — **Computers in Construction.** Contact: CIP Information Services, Inc., 1105-F Spring St., Silver Spring, Md. 20910.

March 24-25, San Diego — **Software Requirement Analysis and Design.** Contact: Data Processing Management Association Education Foundation, Suite 2000, 3420 Kashiwa St., P.O. Box 3608, Torrance, Calif. 90510.

March 24-26, Pittsburgh, Pa. — **Vsam Performance Workshop.** Contact: Solutions, Inc., Box 989, Montpelier, Vt. 05602.

March 25, Washington, D.C. — **Digital Electronic Message Service: Business Opportunities and Regulatory Aspects.** Contact: Executive Enterprises, Inc., 33 W. 60th St., New York, N.Y. 10023.



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Rep. Markey Likens AT&T Breakup to Divorce

By Jim Bartimo
CW Staff

BOSTON — The breakup of AT&T is much like the breakup of a marriage, Rep. Edward J. Markey (D-Mass.), a member of the Telecommunications Subcommittee of the House of Representatives Energy and Commerce Committee, said here recently. "One side gets the house, the car and the summer home — the other side gets all the bills and the mortgage payments."

But even with a messy divorce going on, someone has to watch over the telecommunications industry, Markey told a meeting of the Boston Bar Association. Since neither the courts nor the Federal Communications Commission seems willing to regulate it, Congress must monitor AT&T's divestiture of the Bell operating companies to ensure that there is competition in the industry, Markey said.

The congressman pointed to one area where divestiture has already been a problem. "[American Bell, Inc.] was introducing products two weeks after it was born," he said. "Now, American Bell didn't develop those products in two weeks." Since the research and development for these products took place while the operating companies were still part of AT&T, "the question is: Who paid for this R&D and who should benefit?" he said.

Suspicious Relationship

Voicing suspicion about AT&T's relationship with the operating companies, Markey said that AT&T has allowed the sale of terminals by the operating companies to flow to itself. "There are strong indications that AT&T is preventing the [operating companies] from acting in their own interests," he said.

Congress will also monitor access charges, the solvency of the operating companies and local rates, Markey said.

However, while Congress may monitor local rates, they will still go up in cost, according to another speaker at the meeting. Richard W. Blackburn, general counsel of New England Telephone and Telegraph Co., outlined AT&T's plan for divestiture saying, "By any measure, the job is monumental."

Part 1 of divestiture will be to determine which facilities remain with AT&T and which remain with the operating companies. When the facilities, personnel and accounts have been divided, AT&T will have retained 25% of the business, while the operating companies will have received 75%, Blackburn said.

Part 2 of divestiture will allocate the technical resources of AT&T to the operating companies, and Part 3 will terminate contracts within AT&T, Blackburn said.

Finally, the last part of divestiture will give the intraregion telephone services and the printing of the Yellow Pages to the operating companies, while AT&T retains the interregion telephone services and terminal sales.

Expected to be complete by the last quarter of 1983, divestiture still poses some problems to the telephone giant, such as the definition of local access and transport areas. In Massachusetts, for instance, there are two area-code districts. The question still remains whether AT&T or the operating companies will provide the telephone service between the two area codes or if that type of call will be considered long distance, Blackburn said.

Another problem is which entity will pay for the local loop. Because it is expected that the local loop will be paid for by the operating companies, local rates will rise as this charge is passed on to the customer, Blackburn predicted.

CW Photo by J. Bartimo

American Bell "was introducing products two weeks after it was born. Now, American Bell didn't develop those products in two weeks," Markey observed.

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EDITORIAL

Smooth Sailing

The largest computer company in the world recently reshuffled its top management, and industry watchers barely blinked.

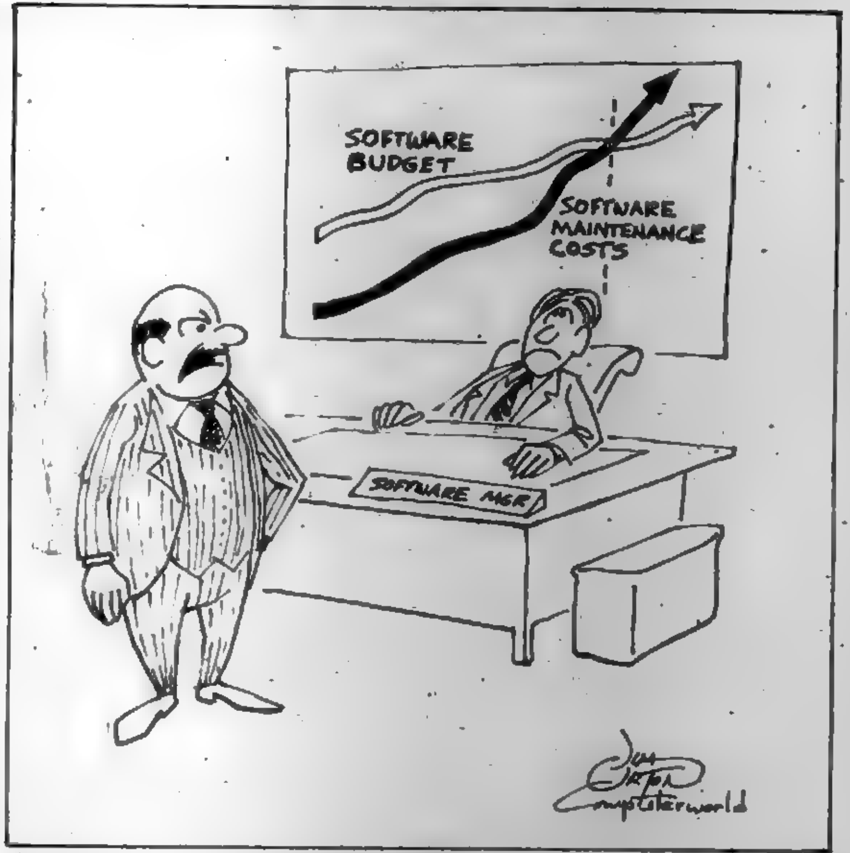
Not that the internal machinations of IBM weren't of some concern. It is simply that there may not be another company in the world that plays management chess more adeptly than IBM.

The moves were crisp and definitive. Frank Cary bowed to "old age" (he's 62), stepping down as chairman of the board, a post he held for 10 years. John Opel, former IBM president and chief executive officer, replaced Cary as board chairman and continues as CEO — the top two slots in the corporation. And John Akers, a personable 48-year-old marketing executive, is now president and logical successor to Opel.

IBM announced several other upper management changes, each executed with the computer-like precision that underscores the company's commitment to long-term management planning. Small wonder that a management survey conducted by *Fortune* magazine rated IBM the most admired, best-managed corporation in the country, while *Dun's Business Month*, in its recent annual review, rated IBM in the top five American best-managed companies.

Perhaps most important, the management changes occur at a time when IBM is at the peak of its game. The company reported strong operating results in 1982, the nation's worst business year in decades. Under Cary's leadership, IBM has penetrated new markets outside its traditional mainframe stronghold. Whether in personal computers, graphics terminals or information services, IBM has demonstrated an implacable ability to capture quickly a dominant share of any new market it enters.

This must be comforting indeed to the "new" management team, which will now ride the crest of a wave generated largely during Cary's tenure. For IBM's competitors, this means trying harder than ever to tread water in a Big Blue ocean.



'Tinktilter, Around Here That's Not What We Mean by "Break-Even Point!"'

DATA PAST

Five Years Ago
March 6, 1978

WASHINGTON, D.C. — The Justice Department will decide "soon" whether to ask for interim relief when it finishes presenting its antitrust case against IBM, Assistant Attorney General John H. Shenefield said at a trade association meeting here.

The head of the department's Antitrust Division declined to tell the members of the Computer & Communications Industry Association at its Fifth Annual Caucus here just what form of relief the government plans to propose in the middle of the nearly three-year-old trial.

— — —

NEW YORK — Digital Equipment Corp. introduced a mainframe in minicomputer clothes. Called the Decsystem-2020, the system extends the firm's mainframe line down into the IBM 370/115 range.

DEC also introduced the Decsystem-2060, a system that expands the capability of the firm's -2050.

Ten Years Ago
March 7, 1973

DETROIT — Burroughs Corp. filled the gap in its small computer series with two B700 systems. The B700s have from 32K to 48K bytes of core and fall between the L8000 series minicomputers and the B1700.

Described as a "perfectly valid" alternative to the smaller IBM System/3, the B700 combines some of the design concepts of the B1700 with an ease of operation Burroughs felt was necessary for the less sophisticated user.

— — —

WASHINGTON, D.C. — AT&T asked the Federal Communications Commission for approval to revise its private-line rates to compete with the specialized common carriers. The rates would affect more than 19,000 private-line users.

Under the proposal, Bell would set up a two-level rate structure based on high-density and low-density routes and monthly rates would drop from $3/mile to 85 cent/mile.

LETTERS

'Not' Picking a Winner

It was with high hopes that I began to read Girish Parikh's In Depth article "How to Pick a Winner: A Look at Software Methodologies" [CW, Feb. 14]. I am reasonably well-informed about the various software methodologies and feel that a good article on the subject was long overdue.

Shortly into the article, I was surprised by a serious inconsistency. Parikh used a common categorization of methodologies (with which I disagree) into data structured and functional. However, I became confused as to his differentiation of these categories when he included data flow diagrams in the latter and Thomas DeMarco's structured analysis, which is based on the use of data flow diagrams, in the former.

Next, I was somewhat taken aback by Parikh's rather transparent suggestion that "an independent observer, preferably an outside consultant," be a standing member of the evaluation team. Parikh is described in the article's biography as "a Chicago-based consultant."

But these annoyances proved minor once I came to understand what Parikh was suggesting, namely, a sort of methodology play-off, which would require a 14-member team (one of whom is the outside consultant) if four methodologies were being considered.

Making reasonable assumptions about coding rates, training time and the like, it would take at least several months (probably more like half a year) before even a preliminary decision would be made (Parikh suggests that the experiment could take over a year).

Just in personnel costs alone, this experiment would cost, in terms of direct salary and fringes, over $200,000. Additional costs for training, purchasing/leasing methodologies, computer time, travel, secretarial support and so on would almost certainly add another $50,000 or so.

I was trying to think of how many firms could free over a dozen people from their systems staffs for over six months and spend over $250,000 to select a methodology (Parikh suggests that more than one might be selected) when it occurred to me exactly where things had gone wrong: Perhaps Parikhs' article was meant to read "How *Not* to Pick a Winner."

Fred L. Forman
Oakton, Va.

Entry-Level Program

The editorial "Buying Certification" [CW, Feb. 14] makes some important points about the distinctions between professional certification programs and educational programs and certificates.

In discussing attempts "to bolster professionalism" the editorial mentions Bank Administration Institute's program, the Certificate in Bank EDP Auditing. It should be made clear that the program in question is *not* for professional certification. If it were designed as such, the requirements for experience and continuing education would be comparable to our Chartered Bank Auditor program, which is a highly recognized professional certification.

The Certificate in Bank EDP Auditing is an educational program for entry-level DP auditors. A curriculum of courses and case problems is meant to provide the structured training and experience that auditors need before they can become fully qualified to perform DP audits.

James R. Pastorello
Executive Vice-President
Education Directorate
Bank Administration Institute
Rolling Meadows, Ill.

LECHT ON SCIENCE /Charles P. Lecht

A Turn of the Screw for U.S. DP Industry

Recent proposals to deny investment tax credit benefits to companies purchasing certain Japanese imports mark the start of a significant development on the stage of world computer technology in 1983. More of the same, involving France, West Germany, England, Italy and, possibly, Korea, will follow as these countries, together with Japan, become capable of technological self-sufficiency and wage truly competitive wars for capturing the marketplace.

Even countries with little or no computer systems manufacturing capability are showing signs of increasing independence from the American technological umbilicus through which they've been nourished for 30 years. India and Brazil typify this group. Whatever the outcome of their current attempts to create their own computer industries, the emergence of multiple non-U.S. sources to meet their technological needs will quite naturally lessen our trade opportunities.

Shrinkage of our marketplace share is hard enough to take when it derives from saturation, local economic decline or diminishing product interest. However, when we stop to consider that this erosion of our competitive position is the unsought result of unmatched and massive global investment by the American scientific community itself, it's a particularly painful turn of the screw.

Look-Alike Alternatives

Today, most of the world is computing on systems of American design. Systems manufactured by American companies either in the U.S. or outside of it, and those foreign-manufactured systems that provide users with look-alike alternatives, command over 90% of sales.

Today's computer people have, for the most part, grown up with the belief that computers are as American as kielbasa is Polish. Even the Soviet Union's Minsk line is an American look-alike. Additionally, the only profitable systems products manufactured by foreign companies with foreign ownership fall into the look-alike category.

Alarmed at increasing global competition, and battered by swiftly decaying product value, American computer and communications systems manufacturers are seeking, not surprisingly, to make government intervention (protection) a part of their defensive strategies. The volume of this rising chorus for governmental intervention is unprecedented in America's computer industry, which traditionally has resisted any active role for government save that necessitated by matters bearing directly on national defense.

Seeking Government Help

For example, having protested our government's intervention in its own affairs, IBM, the world's largest and most successful computer systems manufacturer, recently saw the wisdom of seeking our government's help to protect its business from foreign alleged copycatting.

Others in the Computer and Business Equipment Manufacturers Association are seeking similar help as their foreign marketplaces fall increasingly under local government control. Whatever the immediate provocation, this higher government profile reflects profound changes that critically affect marketplaces for our computer technology both at home and abroad.

Providing the impetus for this increasing government participation is the most crucial development within our industry of recent days: to wit, the synthesis of computer and communications systems technologies.

PTT Monopolies

In America, this, along with communications deregulation, is fostering the emergence of information systems companies purveying both technologies and the services relating to their support, for example, IBM and AT&T. This is not the case abroad, where the government-owned, Postal Telephone and Telegraph (PTT) Administration monopolies are in the process of absorbing their private computer industries or, at least, positioning themselves to control their future.

In France, England, West Germany and Japan, governmental influence over indigenous computer industries is at an all-time high and growing. Having already experimented, to a greater or lesser extent, with imposing technological criteria for component interface between communicating systems, increasing subsidies to computer manufacturers and providing buy-locally tax incentives, foreign governments are finally recognizing the value of their PTTs as instruments for achieving the degree of control they seek over high-tech expenditures made within their borders.

The significance of such control is only fully understood in a wider context. By using their PTTs' communications channels as leverage, governments can reach for near total control of all DP businesses. After all, contemporary computer systems architectures depend upon these linkages for their very existence.

This presents governments with an irresistibly available means for dominating activity in the local DP marketplace. And, by inevitable extension, such dominance has enormous implications for general commerce, population control and conflict management, among other issues, far more than we can adequately address here.

Captured Electronically

For the moment, they view this critical, all-pervading, position simply as a means to lessen their dependence upon foreign products and services, to increase the number of alternative supply channels and to grab an increasing share of the world's growing computer and communications marketplace. But their actions, whether conscious or subconscious, anticipate a world wherein entire countries may be captured through electronic means, and the nice, chocolate-vs.-vanilla distinctions we presently draw between nuclear and conventional conflict are rendered moot for having been superseded by not merely computerized, but computer-resident, engines of war.

In its Jan. 3, 1983 issue, *Time* magazine stated that IBM holds 62% of installed base in the non-U.S. marketplace. Factor in Honeywell, Inc., Sperry Univac, Burroughs Corp., NCR Corp. and Control Data Corp. and we hold over 80%. The point is that already our refusal to sell DP systems or their components to any developed country could damage that country's industry in such a way that it could be neutralized economically.

(Continued on Page 34)

HUMAN CONNECTION /Jack Stone‡

Incorporate Common Courtesy When Hiring

My article "DP Experience: Hiring or Nurturing From Within?" [CW, Nov. 29] prompted many reader responses. Two readers in particular expressed rather unusual views.

Carl Adler, a systems programmer with Unicorn Research and Development of Seattle, introduced an interesting comparison between programming resources and natural resources.

"The issue of training in-house vs. hiring prefab talent has hit close to home. Recently, a friend of mine was let go from a local software house because the firm could not afford the time it was taking to train her. The firm obviously felt that it was better to hire experience and pay whatever it takes to attract it than to cultivate it in-house.

"There's a problem in this attitude that most managers don't want to deal with — a friend calls it 'the ecology of programming resources.' The problem can be expressed in this way:

This is the second in a two-part series titled "Should We Hire or Nurture DPers?"

"If a firm only hires experienced, expensive talent that will be productive immediately, then only those individuals will get the new experience, which they don't particularly need. There is clearly a shortage of these kinds of programmers — how else could they demand and get the kind of salaries they do?

"Since there is a shortage, a manager will need, if not expect, experienced programmers to work a little harder and a little longer than normal. So it seems that there is a relatively small number of crack coders doing most of the work.

"Since the manager has not been doing any in-house training, it becomes more and more difficult to replace burned-out programmers.

"There is an interesting correlation between replacement of our programming resources and replacement of our natural resources. Just as our myopic neglect of the earth is creating problems, our myopic view of DP personnel policy is creating problems in the DP industry.

"We can prevent both ecological situations from worsening by taking a larger view. Almost everyone now understands that we have to use our natural resources carefully and that we cannot continue to burn them up and throw them away. The DP industry must understand that it, too, cannot continue to use up, burn out and throw away its limited programming resources."

Common Courtesy

Joseph Mangraviti of Brooklyn, N.Y., suggested that the issue can be resolved through common courtesy.

"Outside hiring instead of promoting qualified DPers is a plague.

"I've been working with computers for a few years, most recently as a programmer/analyst for the Hong Kong and Shanghai Bank at the World Trade Center in New York.

"I started my career from the very bottom of the ladder, as a keypunch operator, and worked for Company A for two years. Every time there was an opening for a computer operator or programmer, I applied for the job, but never got it in spite of the fact that I had a certificate in programming. One day, Company A hired from Company B a computer operator who had no experience in the field. I was mortified.

"Later on, I applied for a computer operator trainee position at Company B, and I won the job! Neither Company A nor Company B gained a thing by outside hiring; in fact, they both would have been better off if each had promoted its own person.

"I think I have the answer to the problem. First, any organization that has a senior position open should have the courtesy to notify its staff. Second, after identifying those members of the department who might qualify for the opening in question, the manager should evaluate candidates face-to-face so that they can defend their abilities and skills. Third, if the manager cannot find any qualified person on his staff, he should hire someone from outside the firm."

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Foreign Receptivity to American DP Services

(Continued from Page 31)

Our belief that withholding sales of DP systems to certain countries can mean retardation of their industry is underscored by our recent efforts to inhibit or prevent the supply of high-tech systems to the Soviet government. Motivating the French refusal to cooperate with us in this might have been their realization that such a ploy was likely to work, from which it would follow that were we fickle Americans inclined, for whatever reasons, to apply similar sanctions to *them* at a later date, it could be quite harmful to their interests.

It's difficult, if not impossible, to find a single foreign government that is not increasing its control of data processing through its PTT except for those in profoundly underdeveloped countries. The swiftly changing nature of today's computer systems technology and its means of delivery has, thus, not gone unnoticed abroad. It provides each country with new means to reduce purchases of "foreign" (mostly American) computer power, reduce the cost of such purchases by neutralizing the issue of product manufacturer identity and revive its prior, local sources.

It also prepares the way for the emergence of massive integrated systems digital networks (ISDN), from which may flow the powers of data processing with economies of scale as great as those we already enjoy in our telephone service or electrical power.

Among the many ISDN embryos in America today are American Bell, Inc.'s Advanced Information Systems/Net 1000, General Electric Information Services Co., Citicorp's Citishare and the union of IBM's Information Network with Satellite Business Systems communications. Each will give birth to massive computer systems power utilities so compelling in their versatility and cost-effectiveness that today's corporate computer facilities will be reduced to the status of terminals.

But in the U.S., our ISDN owners and operators will compete for user dollars on quality and cost. Their products and services, bundled or unbundled, will provide users with an alternative to obtaining their own hardware, personnel, software, maintenance and so on.

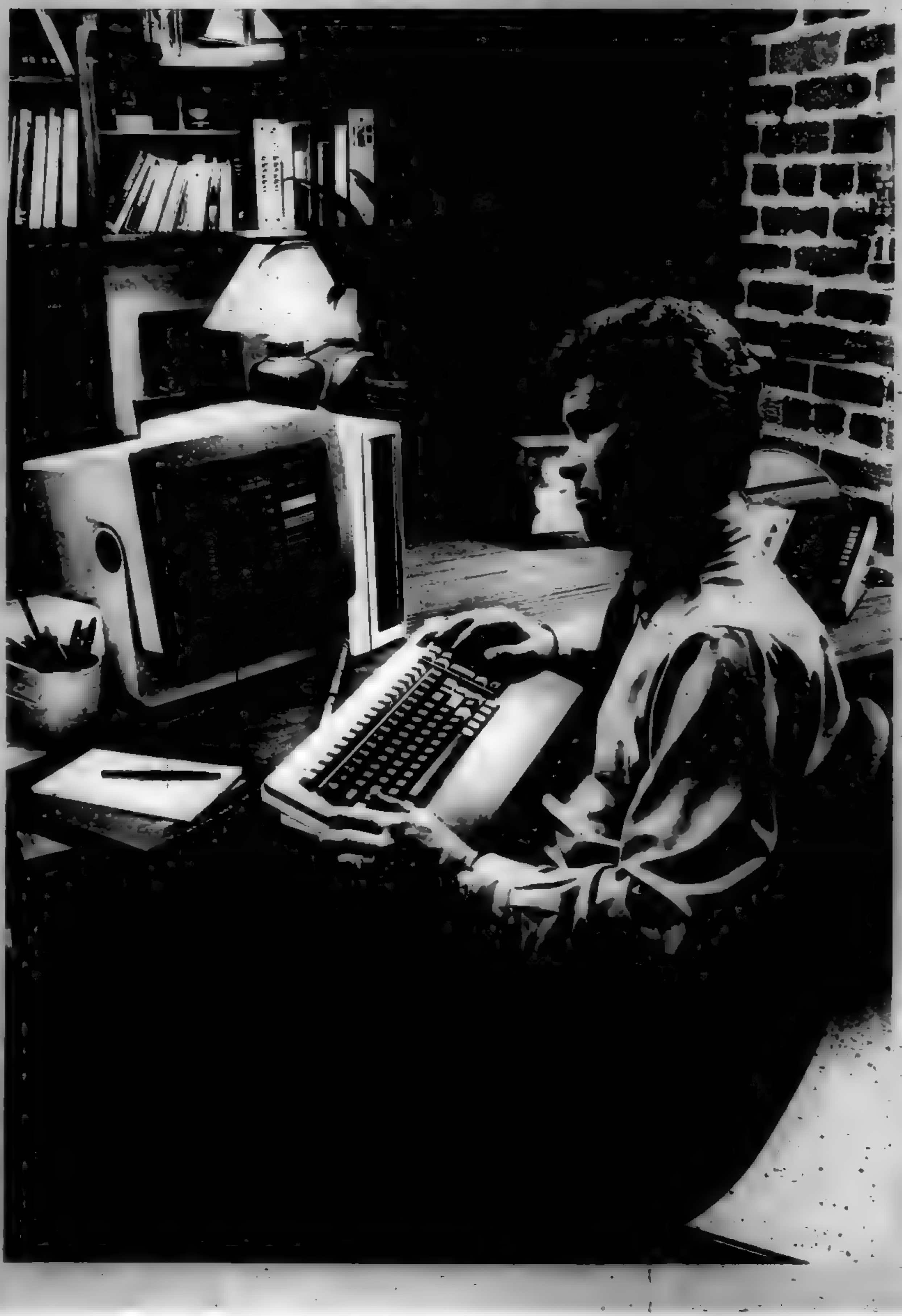
Configuring themselves into massive service bureaus, our ISDNs could ultimately eliminate the need for the possession by large and small corporations of their own DP centers. Using local-area networks controlled by digital private automatic branch exchanges, data processing power will be obtainable from supercenter systems and distributed to terminals virtually everywhere. This phenomenon will continue to foster innovation as each ISDN is enhanced with powers not to be otherwise obtained.

Abroad, ISDN roles (in the near term) will vary in their impact on corporate facilities. While Japan is paralleling the American model (with the exception that its PTT is government owned), various other countries will continue to view their communications systems as separate from computer systems. Establishing interface requirements for users of their communications facilities, and varying connect point locations, governments of such countries will bide their time until the Japanese model is achievable. If their telephone service is poor anyway, they've no need to distribute computer power in the same way.

In all cases, governmental regulation of DP hardware and software will rise. For all countries now know that in their communications systems, they hold the key to the employment (and deployment) of modern computer systems power and all that that implies.

It's ironic that as America initiated the process of deregulating its communications industry and lessened government interference in it, all other developed nations were headed in the opposite direction.

It's highly likely that any government-owned PTT will be pressured into seeking so-



From '83 Onward: A Painful Turn of the Screw

ciopolitical solutions to technological problems at the expense of foreign suppliers. As the PTTs assume central responsibility for providing computer services, the huge variety of computing devices adorning foreign ISDNs will lose their original identities, in much the same way as equipment supporting telephone services has.

Thus, in creating and controlling a single ISDN, a foreign government will obscure the component product identifies that were so vital to equipment sales in the past. But before many foreign ISDNs reach this stage, a myriad of tactics to favor or intimidate suppliers of DP products and services will be employed. What else could one conclude?

Competing in a government-controlled ISDN marketplace will require special skills, including the capacity to deal with foreign governments at a more intimate level than ever before. Increased foreign PTT control of data processing through control of its communications veins, arteries and space alone will produce new challenges for the American computer systems companies. And in countries where the PTT provides competitive products and services, these challenges will be the most difficult to overcome.

In Japan, competition by foreign companies will be most difficult of all. Japan possesses its own computer systems development and usage skills and an excellent PTT, namely, Nippon Telephone and Telegraph (NTT); Japan's motivation for acquiring outside support of internal requirements will diminish, if not evaporate.

Like America, Japan is creating a number of ISDNs. Unlike the American model, Japan's ISDNs all function under the aegis of the government-controlled NTT

NTT's entry into the computer services business through its own functionally identifiable ISDN systems is under way. Combining NTT systems power with that of other ISDNs operating under its umbrella, Japan is creating a massive computer services delivery system that should persuade many local businesses to rid themselves of internal DP systems installations. While this occurs gradually, Japanese development and production of computer systems technology by its high-tech giants — Fujitsu Ltd., Hitachi, Ltd., Nippon Electric Co. and so on — could virtually eliminate outside purchase requirements

That some needs will continue to be met through recourse to external suppliers is, however, inevitable. For trade *outside* the high-tech area cannot be so reduced as to obviate the need for good and intelligently balanced international relationships. And in the mix of things, establishment and/or reinforcement of such relationships may impel the Japanese government to slow down its own homegrown computerization.

The Japanese model is the one toward which the rest of the world, excluding the U.S., will move. To the degree that indigenous high-tech industries prove capable of fulfilling internal needs, this goal will be attained. Thus, countries like Belgium have little hope of self-sufficiency in computer technology for the foreseeable future. The same holds true of Venezuela, Canada, Australia, Austria, Mexico, Brazil and Hong Kong. Italy could be self-sufficient, but internal dissension (as usual) prevents this. Those with the best chance of succeeding are France, West Germany, the UK and Sweden. Australian and U.S. business opportunities for high-tech export to Japan will be last to be lost.

What seems certain is that Americans purveying their high-tech wares abroad will soon find themselves facing European Economic Community-like cartels of local industries, which will be nestled under the protective wings of government PTTs without whose approval sales will be impossible.

Lecht is president of Lecht-Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

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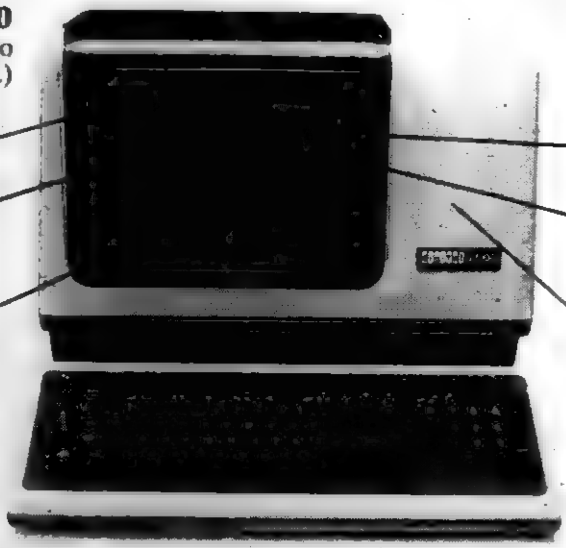

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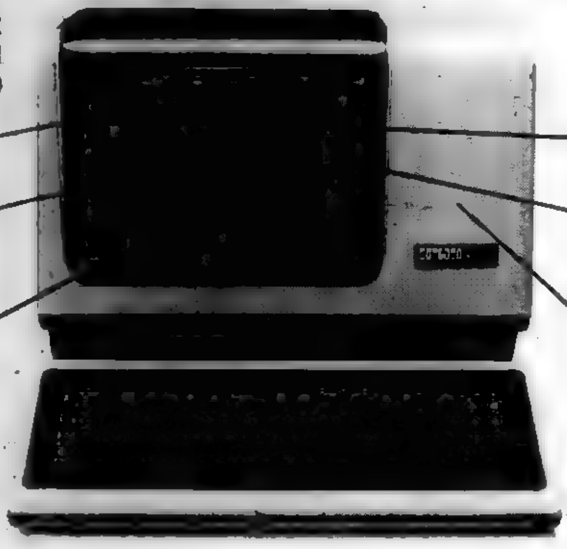

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Software AG Adds Graphics To 'Natural' System

RESTON, Va. — A graphics capability for its Natural on-line application development system has been introduced by Software AG of North America, Inc.

Natural/Graphics reportedly allows users to retrieve data from a Software AG Adabas data base using standard Natural commands. Additional commands are provided by the package to describe the desired graphic presentation of the output. Data records and command information are then passed to specialized graphics software packages that actually create the graphics output, the vendor noted.

The initial implementation of Natural/Graphics supports IBM's Graphic Data Display Manager (GDDM) and Presentation Graphics Feature (PGF) program products. Natural/Graphics is said to run under any teleprocessing monitor or operating system that supports GDDM/PGF. This includes IBM's CICS, TSO, CMS and Software AG's Com-Plete running under IBM's OS/VS1, MVS, DOS/VSE and VM/370 operating systems.

Natural/Graphics may be purchased for $15,000. Various lease plans are available, the vendor said from 11800 Sunrise Valley Drive, Reston, Va. 22091.

MVS/TSO Added To T/S Service

MARINA DEL REY, Calif. — Budget Time-Share, Inc. has announced the addition of IBM's MVS/TSO operating system as part of its time-sharing service.

MVS/TSO is offered as an alternative to VM/CMS and permits interactive time-sharing operations to run concurrently with teleprocessing and batch processing services on systems not originally intended for time-sharing purposes, the spokesman said.

The SAS Institute, Inc. family of statistical analysis, econometrics and graphics packages will be available for both operating systems, the spokesman added.

The company is located at 4739 Alla Road, Marina Del Rey, Calif. 90291.

Monitoring System Spells Real-Time Relief for Bank

Bill Turner

PORTLAND, Ore. — Keeping its DP system efficient used to consist of days or weeks of trial and error in tuning attempts and fire-fighting programs for U.S. National Bank of Oregon here.

Because it is the largest bank in Oregon and handles over 500,000 checking and savings accounts and over 400,000 credit card holders, this process was not only costly and time-consuming, but also totally unacceptable for the firm. Bill Turner, assistant vice-president and manager of the technical services department of the bank, explained, "One of my commitments is to improve the performance of the system, not just one time or whenever we are in trouble, but as a continuous task. I've assigned this as a primary responsibility for one of the systems programmers."

The DP division has made a commitment to performance tuning via its systems programming department. Therefore, it became necessary to find a product to give a detailed look at the inside of the system, pinpointing existing bottlenecks to performance.

The data center often had problems with jobs holding data sets, according to Turner. The programmers never knew which particular data set or what other jobs were waiting in conjunction with that job. The only indication of the problem

(Continued on Page 40)

Simplies Query Functions

Intel Enhances System 2000

AUSTIN, Texas — Intel Corp. has announced that Release 11 of its System 2000 data base management system includes relational data base access functions to simplify the query capabilities of the product for end users, access to multiple data bases, data base modeling and prototyping and decision assist for "what if" data bases.

In an on-line environment, System 2000 Release 11 offers a new teleprocessing interface for IBM TSO and CMS environments. The interface is said to combine the strong points of the existing batch and TP interfaces. For example, user files such as Data, Command, Report and Message are no longer required to be in a particular virtual machine or region. Users can designate file locations through a new syntax called Local File. Additionally, the new interface has performance improvements such as resource release between TP segments and 4K bytes transfer blocks to the user region to improve transaction throughput, the vendor said. Release 11

(Continued on Page 38)

'Execucalc' Update Targets GDDM

NEW YORK — Parallax Systems, Inc. has announced that its IBM VM/CMS based electronic spreadsheet package, Execucalc, now runs with IBM's Graphic Data Display Manager (GDDM) product.

According to the vendor, the GDDM interface was developed in response to the popularity of this product in the information center environment and as a first step toward the development of a color graphic capability for Execucalc.

A perpetual license for Execucalc is available for $5,000 per CPU from Parallax at 331 W. 71st St., New York, N.Y. 10023.

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DG/3275 Announced

Emulation Package Fits IBM

WESTBORO, Mass. — Data General Corp. has announced a software emulation package for accessing IBM systems.

Called DG/3275, the product is designed to permit DG Micronova, Nova, Commercial Systems, Microeclipse and Eclipse computers to access an IBM host computer by emulating an IBM 3275 display station, a spokesman said.

Communication is reportedly accomplished through IBM's Binary Synchronous Communications Protocol.

The DG/3275 is available in two versions: one for the MP/OS and one for the Rdos and Icos operating systems.

The package can be used with either a dial-up or dedicated connection, the spokesman added.

The initial license fee is $2,500. Subsequent licenses are available from the firm at $1,250 from 4400 Computer Drive, Westboro, Mass. 01580.

System 2000 Gets Update

(Continued from Page 37)

also has increased the allowed number of concurrent end user tasks from nine to 230.

For the IBM VM/CMS on-line environment, Release 11 offers several enhancements beyond the TP interface, the vendor continued. These include the addition of a new 4K byte block size to the list of allowable data base and scratch file block sizes. This feature is said to permit users to take advantage of improvements in I/O performance provided by recent enhancements to the VM/CMS environment for fixed block architecture devices. Other Release 11 enhancements are intended to improve data integrity by updating CMS directories more quickly.

System 2000 Release 11 is said to support an IBM Structured Query Language (SQL) type access to one or more System 2000 data bases. By using a new verb, Collect, users can create subsets of portions of one or several data bases. Called collect files, these contain data extracted from the original data bases. They are relational tables, the vendor explained, which may be treated as temporary data bases or used to create another System 2000 data base. Users can employ the Self-Contained Facility Report Writer language and its conversational interface, Genius, to create both column-style reports and a variety of graphics.

The basic Report Writer language has been enhanced with relational data base access facilities and Genius has had graphics capabilities added for the TSO and CMS environments, the vendor added.

System 2000 Release 11 will be available for IBM-based OS and VM/CMS environments the second half of 1983. The conversational Report Writer capability, including graphics, is currently available. The price of the basic System 2000 Release 11 software is $70,000. The Report Writer option is priced at $35,000. Intel is located at 12675 Research Blvd., P.O. Box 9968, Austin, Texas 78766.

IBM Users Get Report Manager

BIRMINGHAM, Ala. — Mantissa Corp. has announced Release 7.1 of its Report Management System software for users of IBM DOS/VS, DOS/VSE, OS/VS1 and OS/MVS.

A new keyword facility provides commands that allow construction of English-like sentences to define report requirements. Extended selection criteria provided in the Select Command, along with additional information provided by the Report Manifest, ties the individual Sysout data sets processed back to the originating job numbers and names.

The spokesman said the OS/VS external writer performance has been increased by 30%. Other new features include Sysout selection by output class and/or destination and native support for all announced direct-access storage devices.

The MVS version costs $19,000 until April 15 and $21,000 thereafter. The DOS product costs $10,000.

The maintenance fee for either system is 12% until April 15, 14% thereafter from Suite 200, 244 Goodwin Crest Drive, Birmingham, Ala. 35209.

Bimp3270 Copies Screen Images To Printers

MINNEAPOLIS — B I Moyle Associates, Inc. has announced a CRT screen print facility for IBM DOS/VSE and CICS/VS users.

Bimp3270 may be used to copy screen images to terminal printers or to system printers or to route output from on-line application programs to terminal printers, a spokesman said. The product can be used to provide hard copy of specific screens in production application situations, for documenting application use problems and for generating sample screen images for application documentation.

The package costs $720, or $360/year on a lease basis from B I Moyle at 4355 Lyndale Ave. S., Minneapolis, Minn. 55409.

Hospital Unveils System/34 Interface

GLEN DALE, W. Va. — Reynolds Memorial Hospital has announced the availability of its IBM System/34-compatible Gencon34, said to control the sequencing of generations from diskette backups.

The software reportedly helps eliminate operator backup and retrieval errors and is completely documented.

Gencon34 costs $95 from Reynolds Memorial, located at 800 Wheeling Ave., Glen Dale, W. Va. 26038.

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JCF Introduced by Xerox

EL SEGUNDO, Calif. — Xerox Corp. has introduced a Job Control Facility (JCF) said to provide IBM users with direct access to features offered by the Xerox 9700 and 8700 electronic printing systems.

Using IBM's MVS/JES 2 operating system, users can reportedly call up Xerox laser printing features through the use of IBM's JCL software, according to a Xerox spokesman.

JCF is said to enable IBM JCL to initiate such features as two-sided printing, page formatting and electronic forms and fonts usage. JCF costs $14,000 plus monthly maintenance of $200, according to the vendor.

Xerox's Printing Systems Group is located at 880 Apollo St., El Segundo, Calif. 90245.

MVS Users Get 'Bdam Fast Path'

SALT LAKE CITY, Utah — Utility Software Co. has announced Bdam Fast Path, for users of IBM's MVS operating system.

The package reportedly offers between 30% and 80% performance improvement over IBM's Bdam and Vsam access methods.

The package is supported on IBM 370 and compatible mainframes using MVS Release 3.8 or MVS/SP operating systems, according to a vendor spokesman. Bdam Fast Path costs $2,000, the vendor said from 2140 Quailstone Drive, Salt Lake City, Utah 84118.

Backup and Restore Facility Out for DOS/VSE Users

MINNEAPOLIS — Davis, Thomas & Associates, Inc. has announced a Vsam backup and restore utility for IBM DOS/VSE users.

Dtavsam is a batch utility that performs I/O at the record level, a spokesman said. The package may be used to reset any reusable data set independently from the data set load. Reusable data sets are reset automatically.

Dtavsam allows for user exits coded in assembler or Cobol. Exits are specified by file to Dtavsam in the input parameter cards at runtime. Exits may be used to delete or change records prior to output, the spokesman said, or to force the end of a data set.

The package costs $1,200 including the first year of maintenance from the firm at Suite 301, 8800 Highway 7, Minneapolis, Minn. 55426.

MSI Software Announces Aid For System/38

OSTERVILLE, Mass. — MSI Software, Inc. has announced the Accounts Payable 2000 system for the IBM System/38. The system reportedly was written in structured RPG-III using externally defined files and designed for the more complex accounts payable environment.

The 2000 system is said to offer multicompany, multidivisional support and be closing-independent. Distributions and interfaces are provided both to general ledger and job costing. Interactive voucher entry and vendor analysis are supported for up to 99 workstations per firm.

A check reconciliation subsystem, general ledger coding subsystem, expense analysis, interactive audit sampling and tax reporting are provided. All 1099 formats are supported with 1099-type code maintenance.

The Accounts Payable 2000 system costs $15,000 from MSI Software, 1054 Main St., Osterville, Mass. 02655.

McAuto 'Co-op' Version Out

ST. LOUIS — McDonnell Douglas Automation Co. (McAuto) has introduced a low-cost version of its distribution system software.

Offered as part of its Customer On-Line Order Processing (Co-op) family, the new version is a fully integrated system said to permit automation of entire order processing cycles from customer order to receipt of payment.

Co-op clients may process on McAuto computers on a time-sharing basis or install the software on their own IBM 4300 series or larger machines. The version uses IBM's DL/1 data base management system and OS and CICS operating environments. Base price is $150,000 from the firm in St. Louis, Mo. 63166.

IBM Micro Users Get Graphics Aid

SAN DIEGO — Integrated Software Systems Corp. (Issco) has announced a software package that is said to enable the IBM Personal Computer to function as a graphics terminal. The software also provides a slide projector capability for storing completed graphics for later viewing, the company said.

The package includes a device driver for a mainframe, mini or 32-bit micro host computer on which Issco's Tell-A-Graf or Disspla graphics software is installed and a floppy disk graphics link for the Personal Computer. Graphics can be produced on any of more than 135 output devices, the company said.

The package can also be interfaced with the company's Cuechart user-prompting system and the Data Connection software family. The initial price of the host computer device driver is $2,000. Encoded floppy disks cost $245 each. The Personal Computer requires a serial communications adapter, a color graphics adapter and a monitor.

The company is located at 10505 Sorrento Valley Road, San Diego, Calif. 92121.

'Espul' Announced For HP 3000 Users

SALEM, Ore. — Data Information Science Center, Inc. has announced a utility program for the Hewlett-Packard Co. HP 3000 said to allow greater flexibility in managing output spoolfiles than is available under HP's Multiprogramming Executive.

Extended Spook Utility (Espul) reportedly allows users to alter or purge spoolfiles by spoolfile identification, user, job/session and file name. Espul costs $750, according to the vendor. Additional information is available from Data Information Science Center, P.O. Box 3185, Salem, Ore. 97302.

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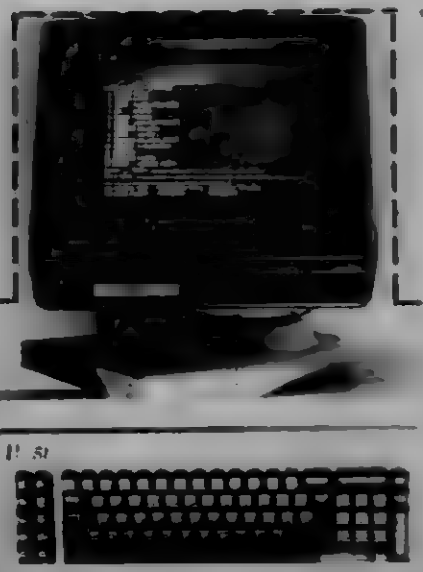

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Monitoring Tool Provides Real-Time Relief

(Continued from Page 37)

was a message on the operator's console to indicate which job was waiting on data sets, he explained. In addition, there were problems with inactive page data sets on the bank's IBM 3033. The only way this information was available was if someone happened to see the system discontinue use of the page data set at the time the error occurred. This meant watching the system constantly.

To eliminate these problems, Turner suggested the purchase of Omegamon, Candle Corp.'s software monitoring system. He felt that Omegamon could monitor the system and provide systems programmers with the kind of information they needed to alleviate data set contention problems, as well as several other situations the center was experiencing.

In fact, there were additional problems that involved time and manpower. For example, the center's IBM 370/168 was down, and IBM's IMS, TSO and batch were all running on the larger IBM 3033N. Omegamon showed that Vtam was in a loop and, unfortunately, Vtam could not be canceled or forced from the operator's console. However, Omegamon was able to command Vtam to end. Without Omegamon, the problem could not have been identified and an Initial Program Load would have been necessary, resulting in 30 to 45 minutes of downtime for both IMS and TSO.

More significant was the center's "elusive problem," as they called it. No one could figure out what was happening. It turned out that the system resource manager (SRM) was swapping out jobs when the auxiliary storage manager (ASM) queue reached a certain depth. However, the depth was not severe enough to warrant this type of action. It seemed the threshold at which the SRM began to take action was set too low. Not only did this needlessly stop the jobs from running, but it also added to the problem by adding to the ASM queue depth. The SRM constants were zapped to relieve this problem and the CPU utilization immediately increased while jobs remained swapped in.

Another problem involved the SRM's limiting multiprogramming level due to paging activity. Again, this was unnecessary. The SRM constants were zapped to allow higher levels of paging. By doing a continuous performance review using Omegamon, the programmers were able to look at the SRM parameters to see where they were wrong and get immediate feedback on what was happening. As Turner described one situation, "We discovered that the SRM had been set at zero. We didn't know when that happened, or why, for that matter. This situation could have prevented page stealing and added to paging activity. Values were set to IBM default, but it was Omegamon that allowed us to go in to correct the problem."

In addition, Omegamon's exception screen helped the systems programmers out of many tough situations, he recalled. There were two or three instances when a disk had dropped the ready status, a situation that was indicated by the exception screen. There were also contention problems on some jobs running on swing shift. The jobs seemed to be conflicting with each other, and it was difficult to pinpoint the place of conflict. Omegamon alerted the programmers to the contention immediately and enabled them to fix the problems on the spot.

Greatest Advantage

Aside from the resolution of all these problems, the greatest advantage for the technical services department lies in the ability to perform real-time tuning of the system. "To be able to tune the parameters and get immediate feedback on the effect has been beneficial to us," Turner said, "especially when we added a third CPU and quite a bit of contention for direct access storage devices. I don't think we could have made it work at all without Omegamon."

In fact, the tuning of the system has been substantially improved. The parameters can be adjusted to see exactly what the effect would be — even while the system is loaded. At U.S. Bank of Oregon, tuning is an ongoing procedure. As Turner stated, "Tuning is not a project to complete and check off your list. It's a continued process, particularly in most shops today that are very dynamic and constantly adding applications or different hardware to their systems. New applications and hardware changes will always have an impact on any tuning already done to the system."

As for the result of all of this system tuning, it is productivity, morale and cost-effectiveness. Turner appraised a 10% to 15% increase in productivity for the entire data center.

There is an effect on the morale of the systems programmers, as well. Turner indicated that the programmers believe Omegamon gives these people better insight into the entire system. He also estimated that the software probably paid for itself within a couple months.

In the final analysis, then, greater system efficiency seems to be the route for greater data center effectiveness. The less downtime, the more productivity. Additionally, with greater productivity comes a rise in morale and cost-effectiveness.

Job Scheduler Out for System 3

CAPE GIRARDEAU, Mo. — An automatic job scheduler for the IBM System/3 Model 15D has been announced by Data Trans-Formation, Inc.

The Cruise package reportedly allows users to schedule any batch or IBM Communications Control Program job to be run automatically at an assigned time and frequency.

The software costs $465 from the firm through P.O. Box 1541, Cape Girardeau, Mo. 63701.

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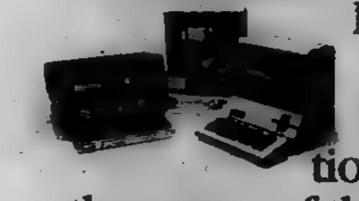

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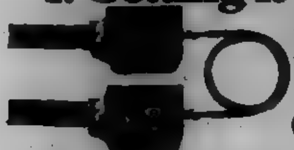

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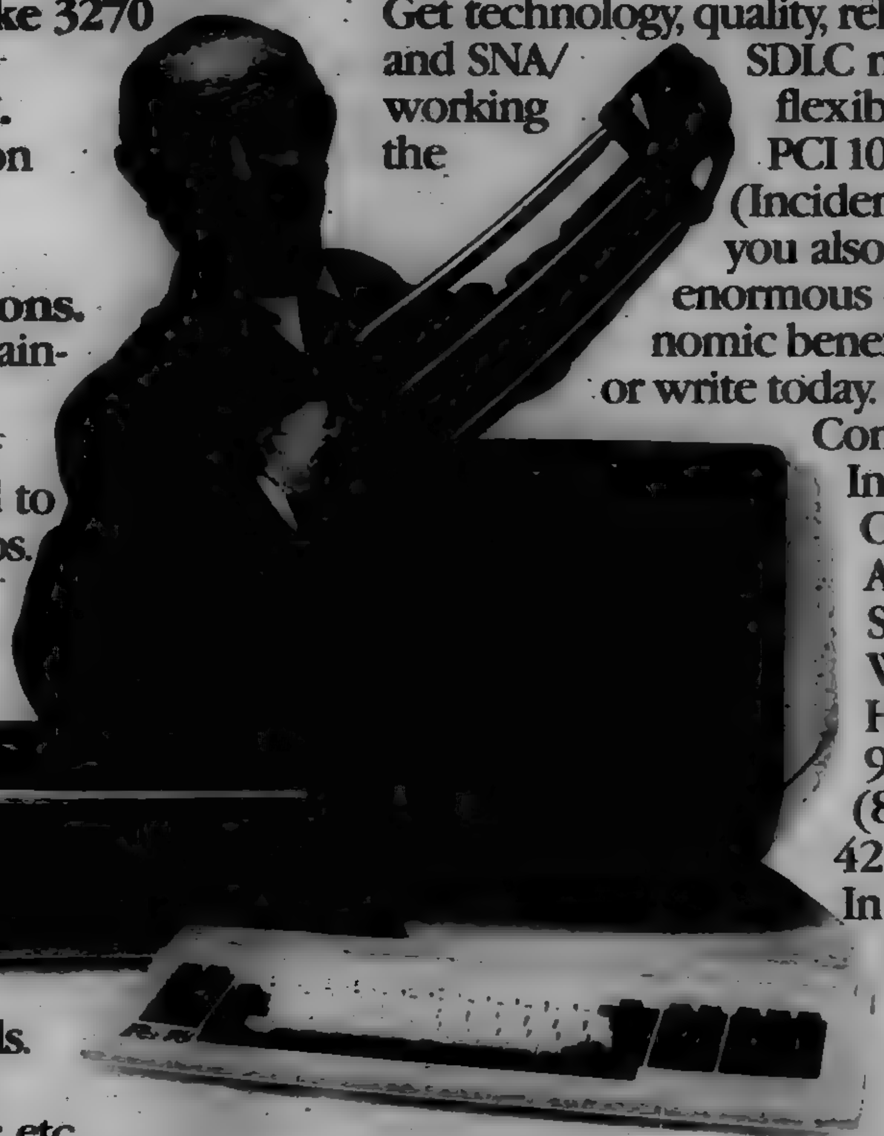

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I.P. Sharpe Adds Data Bases to Its T/S Services

ROCHESTER, N.Y. — I.P. Sharpe Associates Ltd. has added three data bases to its worldwide collection of public time-sharing services. These are the Federal Reserve Board (weekly), the U.S. Flow of Funds (quarterly) and the United Nations Commodity Trade Statistics data base.

The Federal Reserve Board data base reportedly contains weekly banking and monetary statistics released by the Board of Governors of the Federal Reserve System and the Federal Reserve Bank of New York. The information includes money stock measures and liquid assets, factors affecting reserves of depository institutions, assets and liabilities of large commercial banks, commercial and industrial loans by Federal Reserve district and commercial paper outstanding in the New York district. The data base is updated weekly, one business day after the data is released.

The U.S. Flow of Funds is said to be a data base of over 3,600 time series on the sources and uses of funds in the U.S. economy for more than 50 major sectors. It provides a closed model of the entire U.S. economy by bringing the financial aspects of the economy into direct relation to data on the nonfinancial aspects.

The United Nations Commodity Trade Statistics data base provides annual and quarterly history on international trade in 3,075 commodities and is available for 28 developed countries, covering transactions with about 265 trading partners. Commodities are classsified according to the U.N.'s Standard International Trade Classification Revision 2.

There is no subscription fee for these services and no initiation fee or minimum monthly charge for use of the I.P. Sharpe time-sharing system. Users pay $1/hour for connect time, 25 to 45 cents per CPU and 70 cent/1,000 characters transmitted or received.

I.P. Sharpe Associates' U.S. headquarters is located at 1200 First Federal Plaza, Rochester, N.Y. 14614.

RPG Tool Unveiled

LITTLE ROCK, Ark. — Arkansas Systems, Inc. has announced an RPG cross-reference system for the IBM System/34.

The system produces a cross-reference listing for RPG, Work Station Utility or Screen Format Generator source members in one-fourth the time of the IBM cross-reference procedure, the company claimed.

Cross-references are to the Source Entry Utility (SEU) line number rather than the compiler line number so that the cross-reference can be used with source listings produced by SEU, List Library or the compiler.

All basic cross-reference listing information is included. Operation codes may be cross-referenced at the user's option. The printed listing includes the library name, file type for all files and a flag to show all lines on which a field is defined, the company said.

The cross-reference systems is priced at $195 from Suite 202, 8901 Kanis Road, Little Rock, Ark. 72205.

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For Use on Wang VS

Ordering System Unveiled

MONTROSE, Calif. — Mini-Computer Business Applications, Inc. (MCBA) has announced Customer Ordering Processing (COP), written in Wang Laboratories, Inc. VS Cobol, for use on the Wang VS system. COP requires the MCBA Wang inventory management and accounts receivable packages.

COP reportedly provides both single-customer invoicing and two-pass customer order entry with separate billing. The package checks availability and allocates inventory at entry time. COP performs on-line credit checks, provides automatic mass price change ability and supports distribution from multiple warehouse locations.

A source code license for COP is $3,000/computer, complete with a software reference manual and a users' manual. MCBA is located at 2441 Honolulu Ave., Montrose, Calif. 91020.

Asset Aid Fits System/34, 38

GREENSBORO, N.C. — Gary Brown Associates, Inc. has announced a new release of its Fixed Assets Management System/On-Line for the IBM System/34 and System/38.

The package maintains asset data and offers asset accounting and property reporting, a spokesman said. Features include ability to parallel three modes of depreciation per asset; choice of nine depreciation methods; sixteen optional reports including depreciation schedules, fixed-asset ledger, asset additions, analysis of assets, inventory, work sheets and appraisal values; ability to handle multiple companies and divisions; and conversion aids.

The package costs $2,900 for the System/34 version and $4,200 for the System/38 version from 322-B Edwardia Drive, Greensboro, N.C. 27409.

Cross System Option Out for PMO

PITTSBURGH, Pa. — Duquesne Systems, Inc. has added the Cross System Communication option to its Program Management Optimizer (PMO), said to increase efficiency in multiple CPU environments.

The Cross System Communication option reportedly operates in the computer complex where more than one CPU is running. For example, every time an update is made on PMO's managed list in one CPU, the others will automatically receive the same adjustments, eliminating problems associated with manual updates, the vendor said.

PMO costs $5,000 and Cross System Communication costs $1,500 from Duquesne Systems at 2 Allegheny Center, Pittsburgh, Pa. 15212.

Financial System Fits Datamaster

CHARLOTTE, N.C. — Charlotte Management Software Corp. (CMSC) has introduced a fixed-assets accounting system for the IBM System/23 Datamaster.

The package allows nine types of depreciation, as well as automatic conversion from declining to straight-line depreciation, a spokesman said. There are 11 reports available, including new, converted and retired assets, information listing, depreciation projection, register by account number, sequence number or physical location, available tax credits, tax credits taken and tax credits recapture.

A one-time license fee costs $750 from CMSC through P.O. Box 18646, Charlotte, N.C. 28218.

Implementation Of Mumps Out

DEDHAM, Mass. — Datatree, Inc. has announced an implementation of the Mumps language called DT-Mumps for distributed mini systems, including Burroughs Corp.'s B-20 and NCR Corp.'s Worksaver.

DT-Mumps is available for three different hardware configurations: stand-alone (one station), minicluster (two to four stations) and full cluster (five to 16 stations). Licenses are available for each category in bundled or unbundled form. DT-Mumps can also be used with the NCR Worksaver and the Burroughs B-20 system when obtained as an unbundled license, although custom changes made to the operating system by other vendors may need to be integrated, the vendor said.

The implementation is said to conform to the Ansi-1977 Mumps standard, including 1982 Type A revisions.

The software is designed to offer performance levels at each workstation that are comparable to those of a dedicated minicomputer, with common data bases and other system resources shared via a local-area network, the vendor said. DT-Mumps is implemented under Convergent Technologies' CT operating system.

The list price of DT-Mumps ranges from $3,000 to $6,000, depending on configuration. A use-only license is available for between $1,000 and $2,000, the vendor said through P.O. Box 1234, Dedham, Mass. 02026.

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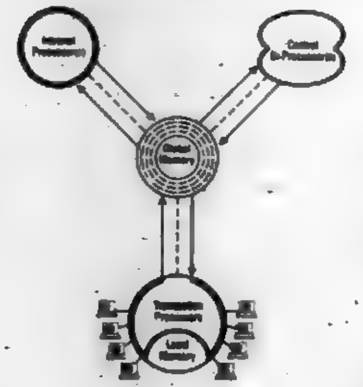

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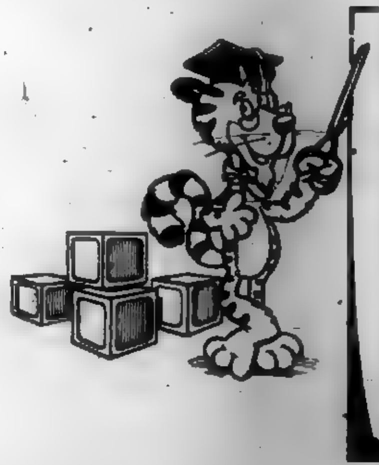

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Programs Out for VAX-11s Under VMS

WEST NEWTON, Mass. — Cogitech has announced two products for Digital Equipment Corp.'s VAX-11 computers running under VMS.

Trouble Report Manager tracks software, documentation and design errors throughout the project life cycle, the spokesman said. Features include flexible input format with prompting, programmable report generation, prevention of accidental deletion or tampering and use of VMS mail system. The product costs $1,500.

Configuration Manager provides control over archiving and updating of programs and documents, the spokesman said. A status log shows the date and reason for modification. Automatic reservation with exclusive locking prevents concurrent modification of documents.

Other features include file security, trouble reports from Trouble Report Manager, report generation and electronic mail notification of updated material. The package costs $1,200.

A set of both programs costs $2,200 from Cogitech at 13 Henshaw Terr., West Newton, Mass. 02165.

Security Package Runs on Wang VS

BROOKFIELD, Wis. — Analytics, Inc. has announced a combined program menu and operator security processor for setup and maintenance of a security system on Wang Laboratories, Inc.'s VS computers.

Called Security/Menu System, the package reportedly provides a general-purpose menu generator that dynamically generates application and program menus at runtime. The process is said to eliminate the need to compile menus for each operator and to coordinate access codes in operator, data and program files.

The user defines the application system at user division, menu and program levels. Operators are linked to the application file through the assigned Security/Menu access codes. A spokesman said the package reviews operator access rights and initializes usage constants for the specified user division.

The package costs $485 from 165 Bishops Way, Brookfield, Wis. 53005.

Anacomp Forms CIS Users Group

INDIANAPOLIS — Anacomp, Inc. has announced that licensees of its Continuous Integrated System (CIS) have formed a users group that will guide future system enhancements. Richard Weiss, first vice-president of First Wisconsin National Bank of Milwaukee, was elected president, a spokesman said.

CIS is a retail banking software system that includes two major modules — delivery and customer. The delivery module can be used to establish a single system to process and control all existing transactions, the spokesman said. The customer module includes customer geographics and demographics, as well as an office call facility, customer Individual Retirement Account reporting, complete customer risk analysis and financial statement reporting, the vendor spokesman said.

Anacomp can be contacted at 11550 N. Meridian St., P.O. Box 40888, Indianapolis, Ind. 46240.

VAX Users Get Payroll System

AUSTIN, Texas — Standard Business Systems, Inc. has announced the Interactive Payroll System (IPR) for users of Digital Equipment Corp. VAX and Decsystem 20 computers.

IPR is a menu-driven package that includes an interface to most general ledger systems, a spokesman said. The package can handle up to a million employees, including job sharing and multiple jobs by an employee. The package produces more than 40 reports associated with bi-weekly, monthly and demand payrolls on tape, microfiche and hard copy, according to a vendor spokesman.

The package is priced at $20,000 from One Hidden Cove, Austin, Texas 78746.

Analysis Tool Fits System/38

SHREWSBURY, Mass. — Trisys, Inc. has announced the addition of the Control Language Analysis program, said to eliminate the error-prone task of updating by hand, to its series of IBM System/38 conversion and operation tools.

The program reportedly performs a complete analysis of the installation's control language and creates a series of reports that show the relationships among the files, programs and procedures in the applications software and between applications software and the IBM utilities, according to a vendor spokesman.

The reports show where all files are created, used and updated; when events occur in a job stream; and where and when control language programs call other control language, RPG and Cobol programs, the vendor said.

The license fee for the Control Lanaguage Analysis program is $750. More information is available from Trisys, which can be reached through P.O. Box 274, Shrewsbury, Mass. 01545.

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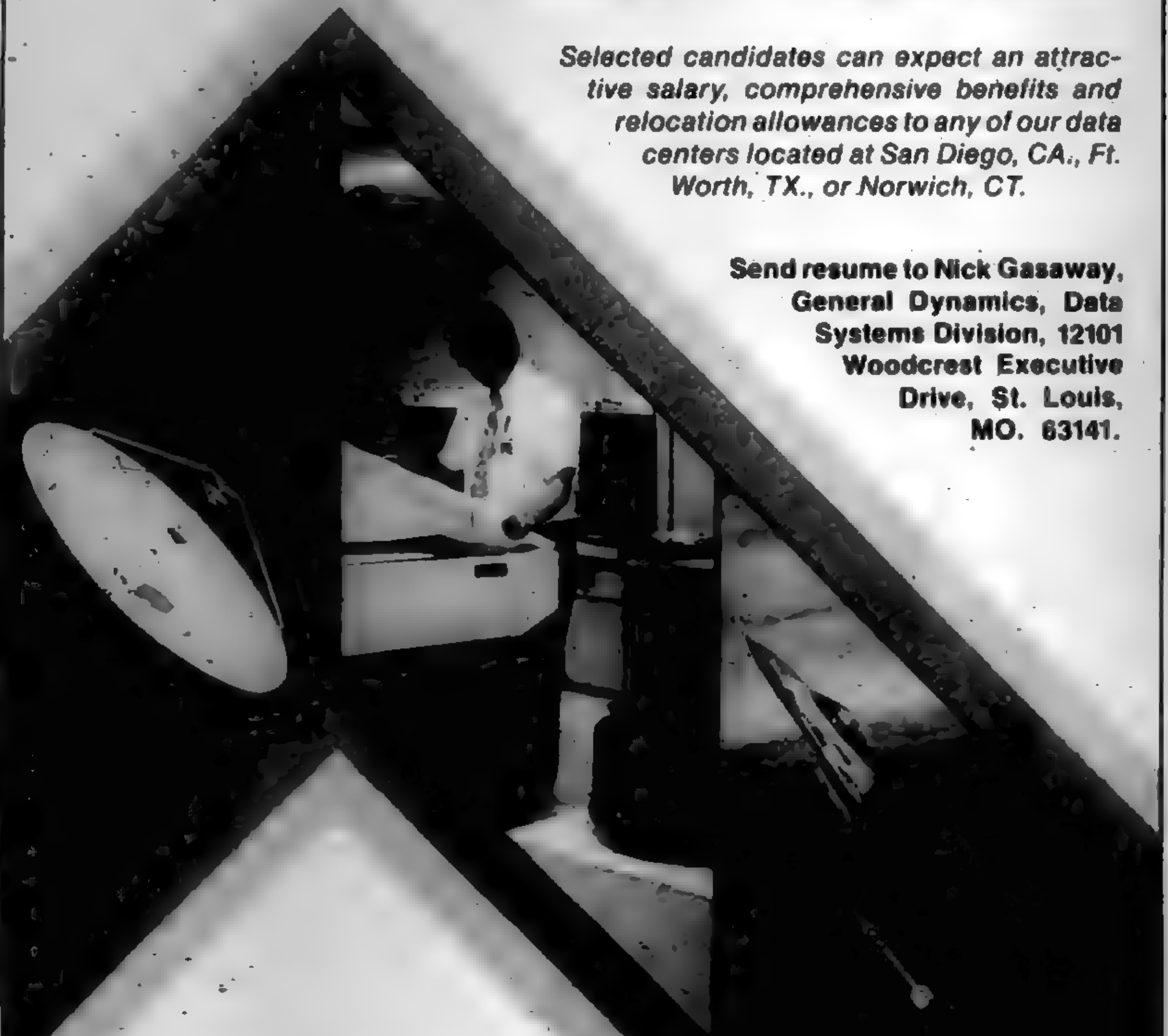

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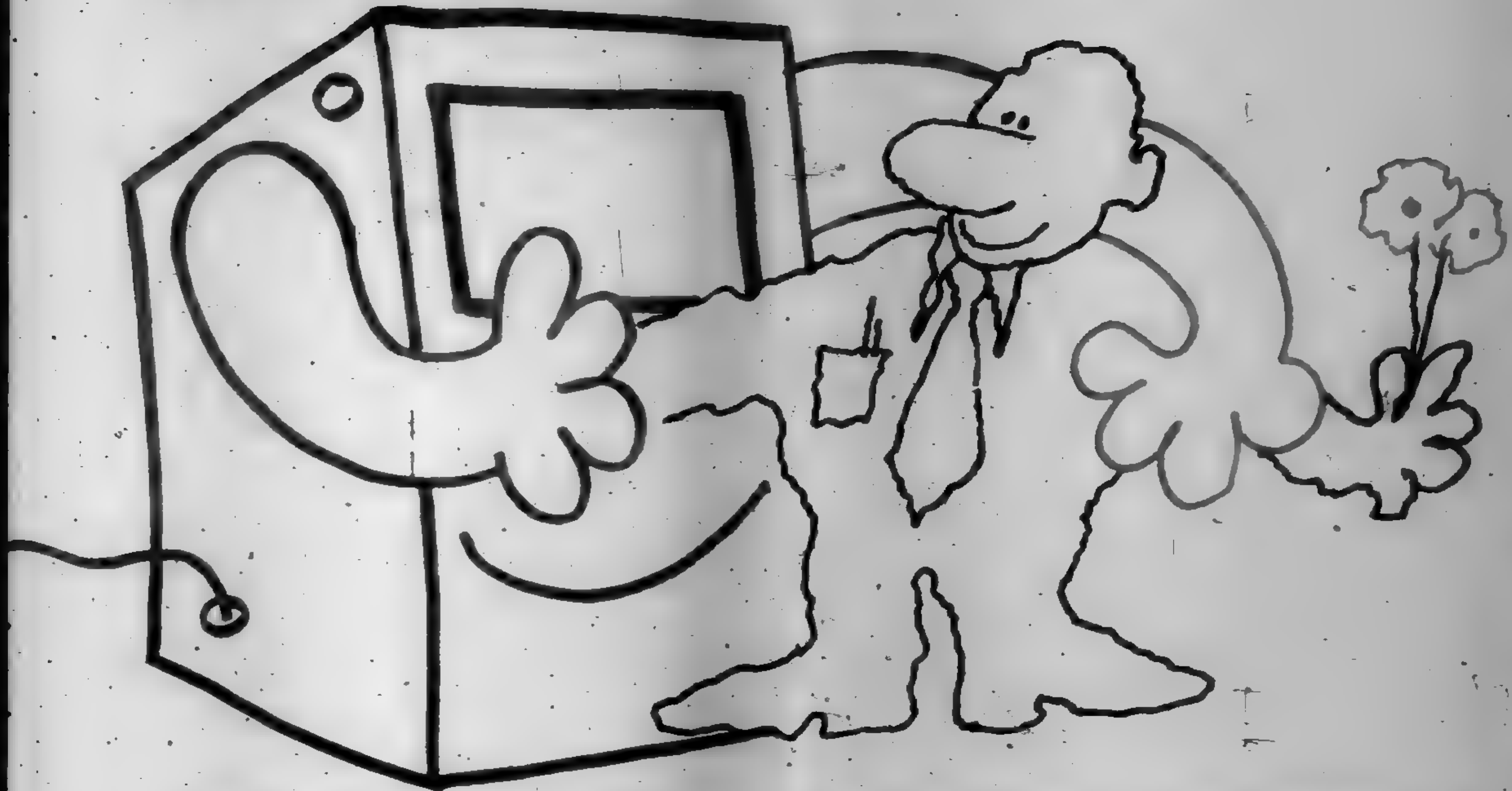

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Micro Notes

Microtek, Inc. has announced additional **driver software** for its Hal memory board for the IBM Personal Computer. The software allows the Hal board to be used as a random-access memory board, a printer spooler and a disk emulator, the vendor said. The software costs about $125, but, the vendor said discounts are available with the purchase of the Hal board. The vendor is located at 9514 Chesapeake Drive, San Diego, Calif. 92123.

Professional Software, Inc. has announced three adjunct software packages for its Wordpro word processing packages for the Commodore Business Machines, Inc. processors. The **Administrator** is a data base management package for the Commodore 8032 microcomputer, which includes multilevel sorts, mathematical functions between numeric fields and file searches. It costs $595. **Infopro** is an information management package for the Commodore 8000 and 9000 series processors designed to enable users to manipulate large amounts of information and print user-defined reports. It costs $295. **Wordpro Mail List** is designed for mailing list applications. It costs $150, the vendor said from 51 Fremont St., Needham, Mass. 02194.

Relational Solutions, Inc. has announced **PC/Help,** a Help facility for the IBM Personal Computer. The package can deliver information about various commands available under the PC/DOS operating system. It costs $29.95, the vendor said from Suite 103, 5857 S. Gessner, Houston, Texas 77036.

A.D. Software, Inc. has announced a **line of programs** that translate existing Intel Corp. 8080 or Zilog, Inc. Z80 microprocessor assembly language programs to Zilog's Z8000 line of 16-bit processors. There are three programs in all: a Z80 to Z8000 translator, an 8080 to Z8000 translator and a Z8000 relocating Macro-Cross Assembler. All three are sold as a package for $179.50, the vendor said from Suite 100, 2950 S. Jamaica Court, Aurora, Colo. 80014.

Omtool Corp. has announced a specialized version of its **Softbol** I language package for the Digital Equipment Corp. VT-180 microcompoter. The package allows business applications to be written in DEC's commercial language, Dibol. The Softbol I package costs $395. The vendor also announced that it has cut prices on components of its Softbol language system by up to 90%. The Digital Research, Inc. CP/M version now costs $750 for the compiler and $40 for the runtime system. The Bell Laboratories Unix version costs $2,500 for the compiler, bundled with 100 runtime licenses and additional runtime licenses priced at $400 for 10. Omtool is located at 212 Bacon St., Waltham, Mass. 02154.

Boardroom Executive Software has released a utility program called **Wind/X** that performs screen — clearing maneuvers on IBM Personal Computers. It is available for $40 from the vendor at Suite 240, Airport Park Plaza, 255 N. El Cielo Road, Palm Springs, Calif. 92262.

International Software Enterprises, Inc. (ISE) announced the availability of multiuser versions of Micro Data Base Systems, Inc.'s **MDBS III** data base management system that it markets for 16-bit microcomputers running under Digital Research, Inc.'s MP/M, Microsoft Corp.'s 8086 Xenix and Bell Laboratories Unix operating systems. Pricing starts at $2,250, ISE said from 250 W. Sagamore Pkwy., West Lafayette, Ind. 47906.

Ikier Technology, Inc. has announced a graphics package called **Icore** for microcomputers running under the Digital Research, Inc. CP/M-86 operating system. This package costs $2,000, Ikier said from 7 Oak Park, Bedford, Mass. 01730.

Hewlett-Packard Co.'s HP Series 200 Model 16 microcomputer now offers **Context MBA,** an integrated management software program, for $795. Further details can be obtained from the vendor at 3000 Hanover St., Palo Alto, Calif. 94304.

Synergistic Software, Inc. has released a utility called **Basic Programming Tools** for the IBM Personal Computer. The software needs PC DOS, 64K bytes of memory and one disk drive. It costs $120 from the firm at 830 N. Riverside Drive, Renton, Wash. 98055.

Interactive Systems Corp. has announced a family of Bell Laboratories Unix-based software products designed to increase productivity in software development and documentation efforts. Prices for the **Advanced Productivity System** range from $11,000 to $47,500 from 1212 Seventh St., Santa Monica, Calif. 90401.

Digital Research, Inc. has announced a version of its 16-bit **CP/M-86 operating system** for the IBM Personal Computer priced at $60. The vendor can be reached through P.O. Box 579, 160 Central Ave., Pacific Grove, Calif. 93950.

Also from Digital Research is a 16-bit version of the **Cbasic compiler (CB86)** said to run on any system operating under several Digital Research 16-bit operating systems, including CP/M-86, MP/M-86 and Concurrent CP/M-86. CB86 costs $600 through P.O. Box 579, 160 Central Ave., Pacific Grove, Calif. 93950.

Dataflo Corp. has announced the **Datacalc** financial planning and analysis software package for Wang Laboratories, Inc. 2200 series computers. The $1,500 package is available from Suite 502, 16400 Southcenter Pkwy., Seattle, Wash. 98188.

Microsoft Corp. has announced that its **Xenix** multiuser operating system will be the standard operating system on Radio Shack's TRS-80 Model 16 microcomputer equipped with 256K bytes of memory and a hard disk. Up to three users can operate programs simultaneously with Xenix. All applications software currently offered by Radio Shack can be moved to Xenix. The package will be available from Radio Shack dealers.

Daystar Systems, Inc. has announced **Ultrafast,** a flexible disk random-access memory emulator for the IBM Personal Computer. The package allows a portion of the computer memory to emulate up to four flexible disk drives. The product is free with the purchase of a 512K-byte Ultraram memory board at $895 or separately for $39.95 from Suite L, 10511 Church Road, Dallas, Texas 75238.

Roklan Corp. has released **Autogrammer,** an automatic program generation tool that is said to require no knowledge of programming languages. The package runs on the Radio Shack TRS-80 Model II microcomputer and costs $300 from Roklan at 3335 N. Arlington Heights Road, Arlington Heights, Ill. 60004.

Roklan Corp. also announced two programming utilities for the Atari, Inc. 400/800 home computer. **Aide** is the Absolute Disk Editor for data management. **Telecom** offers communication with a variety of other computers. Aide costs $30. Telcom costs $70 from 3335 N. Arlington Heights Road, Arlington Heights, Ill. 60004.

Howard W. Sams & Co. has announced software for the Apple Computer Corp. Apple II or Apple II+ computer. **Pretty Darn Quick** is a data handler offering editing features and search and retrieve. It costs $40. **Money Tools** is a home or small business financial record keeping and reporting system. It costs $60. All packages are available from 4300 W. 62nd St., P.O. Box 7092, Indianapolis, Ind. 46206.

United Microwave Industries, Inc. has announced **Wordcraft 20,** a word processing package for users of Commodore Business Machines, Inc. VIC-20 microcomputers. The package comes with a permanent read-only memory cartridge, which allows the user to create documents, letters and personalized form letters. The

(Continued on Page 50)

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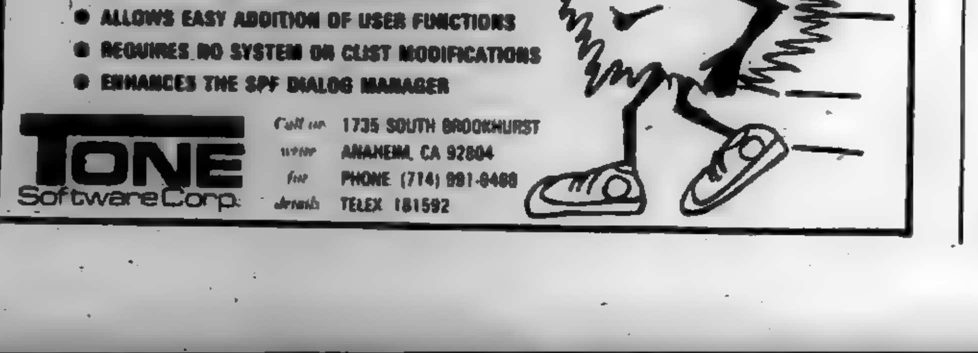
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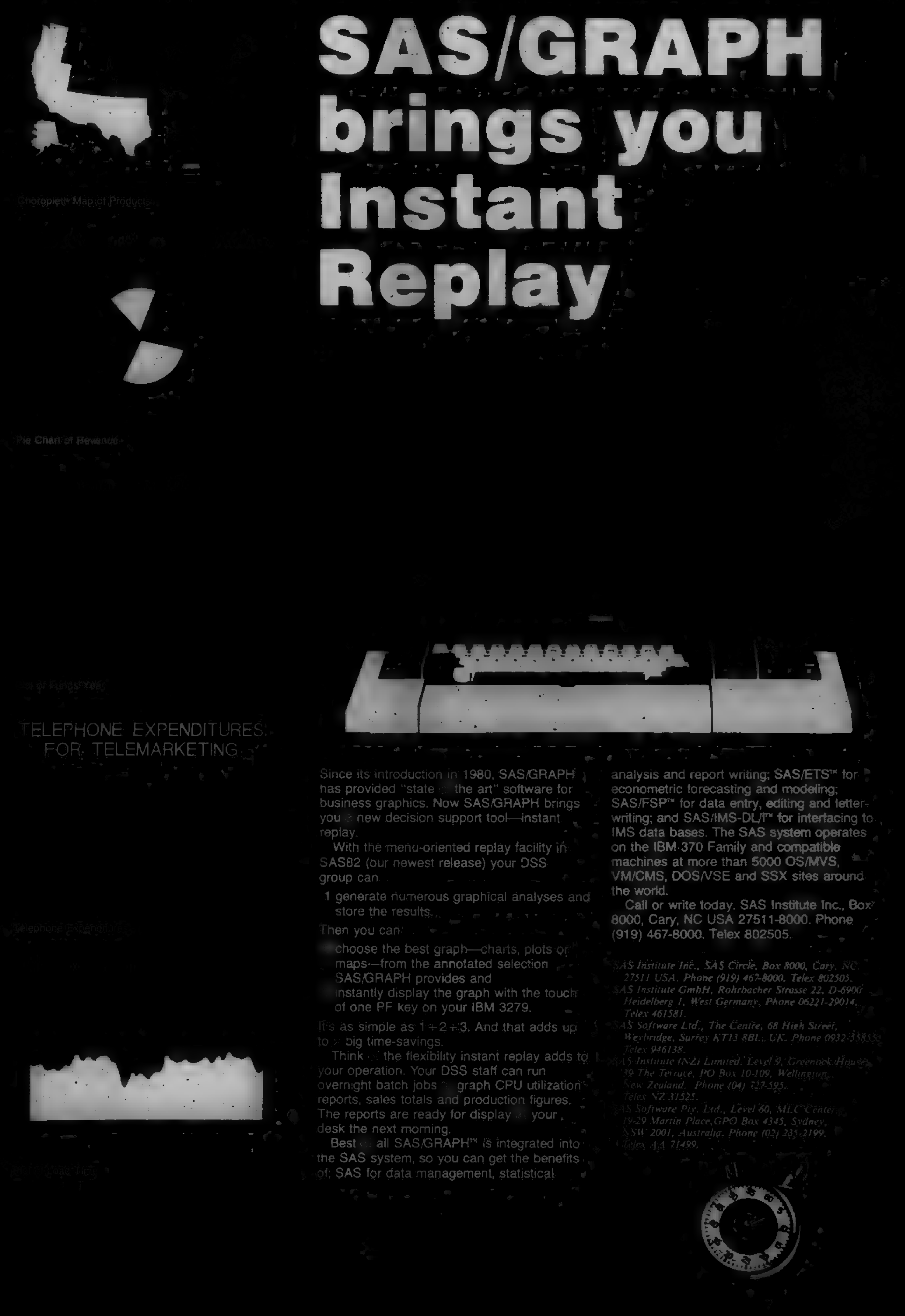

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SAS Software Pty. Ltd., Level 60, MLC Centre, 19-29 Martin Place, GPO Box 4345, Sydney, NSW 2001, Australia. Phone (02) 235-2199. Telex AA 71499.

Financial Modeling Package Targets Users of Wang VS

SEATTLE — Minicomputer Modeling, Inc. has announced Data*Model/B, a financial modeling package for users of Wang Laboratories, Inc. VS, Office Information Systems and 2200 series processors.

Data*Model/B was designed for users who do not require the consolidation and external file interface capabilities of the firm's Data*Model package. Data*Model/B can produce interactive models using menus.

Model results can be integrated into word processing systems. Models can be very large — up to 30,000 rows and 500 columns — and the package includes built-in data projection, financial and goal-seeking routines, the vendor said.

Data*Model/B costs from $1,200, the vendor said from Suite 508, Queen Anne Sq., 200 W. Mercer, Seattle, Wash. 98119.

'Costrol' Unveiled

COLONIA, N.J. — Computer Cost Control Corp. has unveiled a software package for the IBM Systenr/34 designed to provide resource control for fleet and transportation management.

Costrol manages key maintenance resources, including equipment, labor, energy, parts, fuel, drivers and facilities.

It features recordkeeping of those key resources and reportedly generates reports that provide information and analyses for fleet management and cost control, the vendor explained.

Batch processing and time-shared on-line service using the Costrol system is available, the vendor said.

The license for the System/34 configuration is $17,500; the System/38 version, scheduled for release in June, costs $27,500.

Computer Cost Control is located at 805 Inman Ave., Colonia, N.J. 07067.

File Utility Out for HP 3000

SANTA CLARA, Calif. — Goldin Software Systems, Inc. has announced a file compression utility for users of Hewlett-Packard Co.'s HP 3000 minicomputers using HP's MPE III and MPE IV operating systems.

Compress/3000 reportedly can cut the amount of disk space used by 50% to 75%.

It costs $750/CPU from 609 Meadow Ave., Santa Clara, Calif. 95051.

Three Decision Support Tools Out

WESTBORO, Mass. — Data General Corp. has announced three decision support tools from independent software vendors.

The packages include FCS-EPS from Evaluation and Planning Systems, Inc., SPSS, Inc.'s Conversational Statistical System (SCSS) and Box-Jenkins from I.P. Sharpe Associates Ltd.

FCS-EPS is a high-level interactive financial planning and decision support system using business English, a spokesman said.

SCSS is a conversational system for on-line analysis of data for statistical analysis, tabulation, queries about a file and general data management.

Box-Jenkins is an analytical tool for forecasting time series data.

Under the independent software vendor agreement, the vendors sell and support their own software products, the spokesman said.

The prices range from $2,000 to $48,000 from DG at 4400 Computer Drive, Westboro, Mass. 01581.

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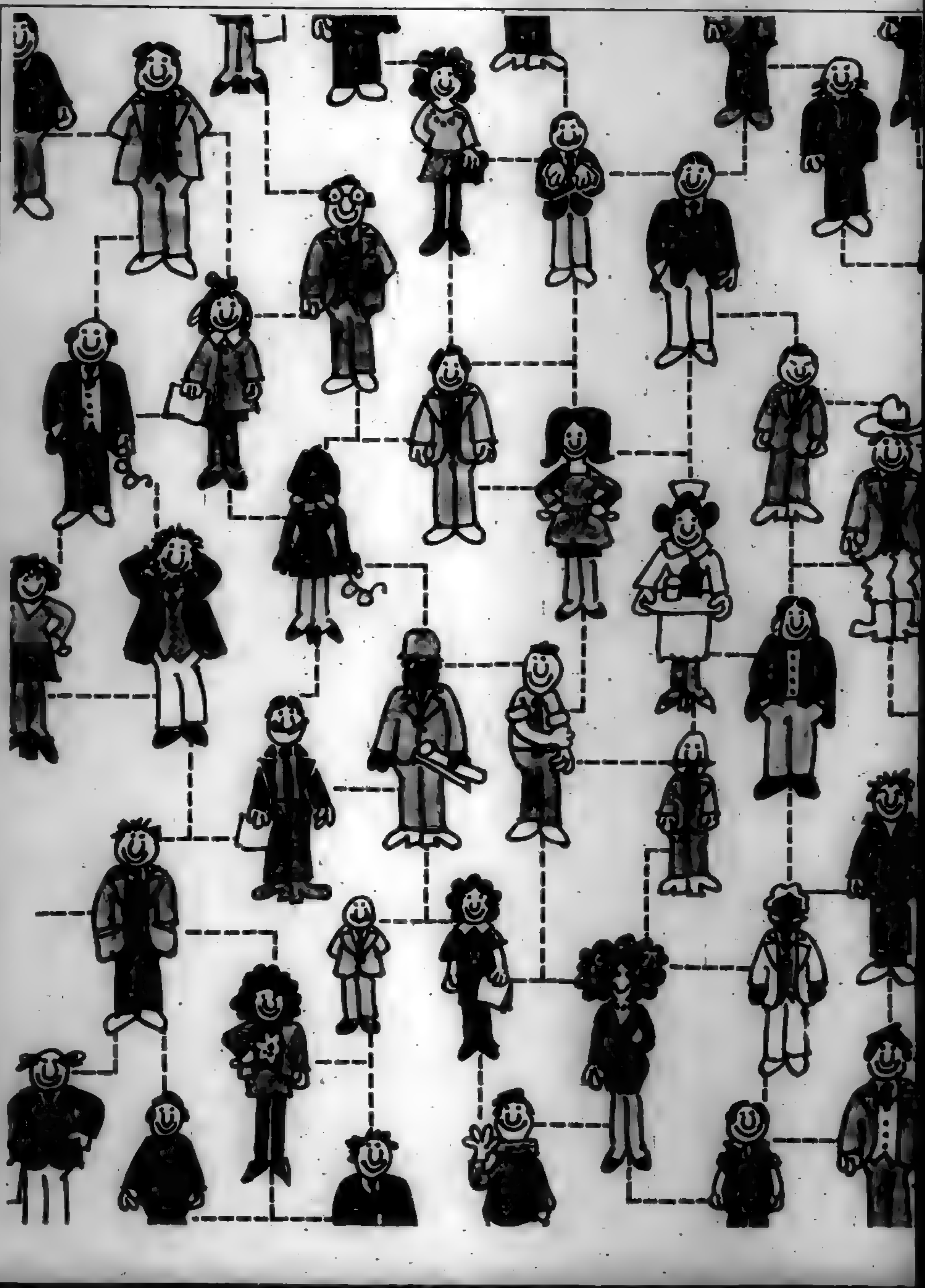

Report Generator Unveiled For Hewlett-Packard 3000

TAMPA, Fla. — Collier-Jackson, Inc. has released CJ/Advanced General Ledger, a report generator for the Hewlett-Packard Co. HP 3000 computer.

The system reportedly handles reorganization, consolidations and new products and projects. Users can define and produce reports at any level of the organizational structure and assume control of the contents and appearance of reports via a financial report writer.

On-line inquiry provides access to financial status of the organization, groups, departments or accounts, the company claimed.

A license fee, including a two-day management training class, costs $18,000 from 5406 Hoover Blvd., Tampa, Fla. 33614.

Stratus Package Reads Ticker Tape

NATICK, Mass. — Stratus Computer, Inc. has announced a software package for its Stratus/32 Continuous Processing System that allows applications to read ticker tape lines supplying stock, bond and option trading information.

The Stratus Financial Ticker Protocol Support (FTPS) reads data provided by any of the financial trading services that use the binary synchronous broadcast ticker protocol, a spokesman said. FTPS provides data transmission checking, blocking, code conversion and error detection.

A system license costs $5,000 from 17 Strathmore Road, Natick, Mass. 01760.

Data Acquisition Module Serves DAS 9100 Users

BEAVERTON, Ore. — The Design Automation Division of Tektronix, Inc. has announced the 91A24 Data Acquisition Module for its Digital Analysis System (DAS) 9100. Targeted for real-time analysis of software operation during development and integration, the 91A24 reportedly helps the user track complex software flow and selectively store data.

Coupled with the extended Define Mnemonics feature of the DAS, the 91A24 provides the user with a tool for support of proprietary microcomputer designs and system analysis, the vendor said.

The DAS 91A24 Data Acquisition Module is priced at $5,500 from the vendor through P.O. Box 1700, Beaverton, Ore. 97075.

Net Customers Get Graphics For Business

CINCINNATI — Imagematrix, Inc. has announced that it will provide a computer-generated business graphics service to customers of Compuserve, Inc.'s information network.

The graphics service, called Quick 'N Quality, allows users to create data for 35mm business slides or overhead transparencies, the vendor said.

The service costs $8 to $25 for slides and $20 to $37.50 for transparencies. Prices vary according to the complexity of the graphics, the vendor said from Suite 400, 120 E. Fourth St., Cincinnati, Ohio 45202.

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Micro Notes

(Continued from Page 46)

package costs $270, the vendor said from 3503 Pomona, Calif. 91768.

Data Transport, Inc. has announced **PC Create**, a program generator for IBM Personal Computers and Apple Computer, Inc. Apple II systems. The package offers structured source code in Basic and allows users to add their own application modules. The package costs $50, the vendor said from 347 E. 62nd St., New York, N.Y. 10021.

Microrim, Inc. has announced the **Relational Information Management (RIM)** data base for the IBM Personal Computer. RIM reportedly can be transported between many types of computers in a network environment and runs under Microsoft, Inc.'s MS/DOS operating system. The price is $795 from P.O. Box 585, 555 116th Ave. N.E., Bellevue, Wash. 98009.

North American Technology, Inc. has announced the **Unify** relational data base management system. The Bell Laboratories Unix-based software is designed for 16-bit microcomputers and costs $2,995 from the vendor at 9570 S.W. Barbur Blvd., Portland, Ore. 97219.

Cyberfile DBMS offers interactive application development and data access on Digital Research, Inc.'s CP/M-based and Microsoft, Inc.'s MS-DOS-based microcomputers. This software is available for $1,200 from Cyberfile Data Systems Corp., 31225 La Baya, No. 110, Westlake Village, Calif. 91362.

I.P. Sharp Associates Ltd. has released **Micromagic** for Visicorp Visicalc formatting on the IBM Personal Computer. It costs $150, the vendor said from Suite 1900, 2 First Canadian Place, Toronto, Ont., Canada, M5X 1E3.

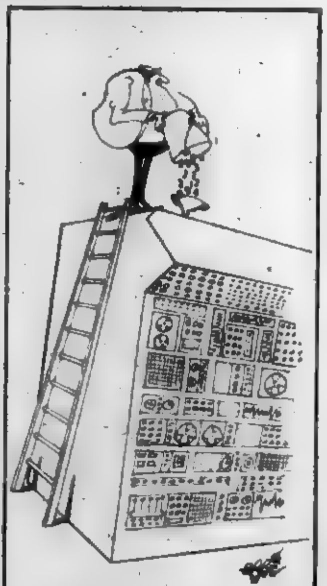
Infoshare is a communications package from The Information People that runs under either Digital Research, Inc.'s CP/M or MP/M operating software. It costs $250, the vendor said from 443 Hudson Ave., Newark, Ohio 43055.

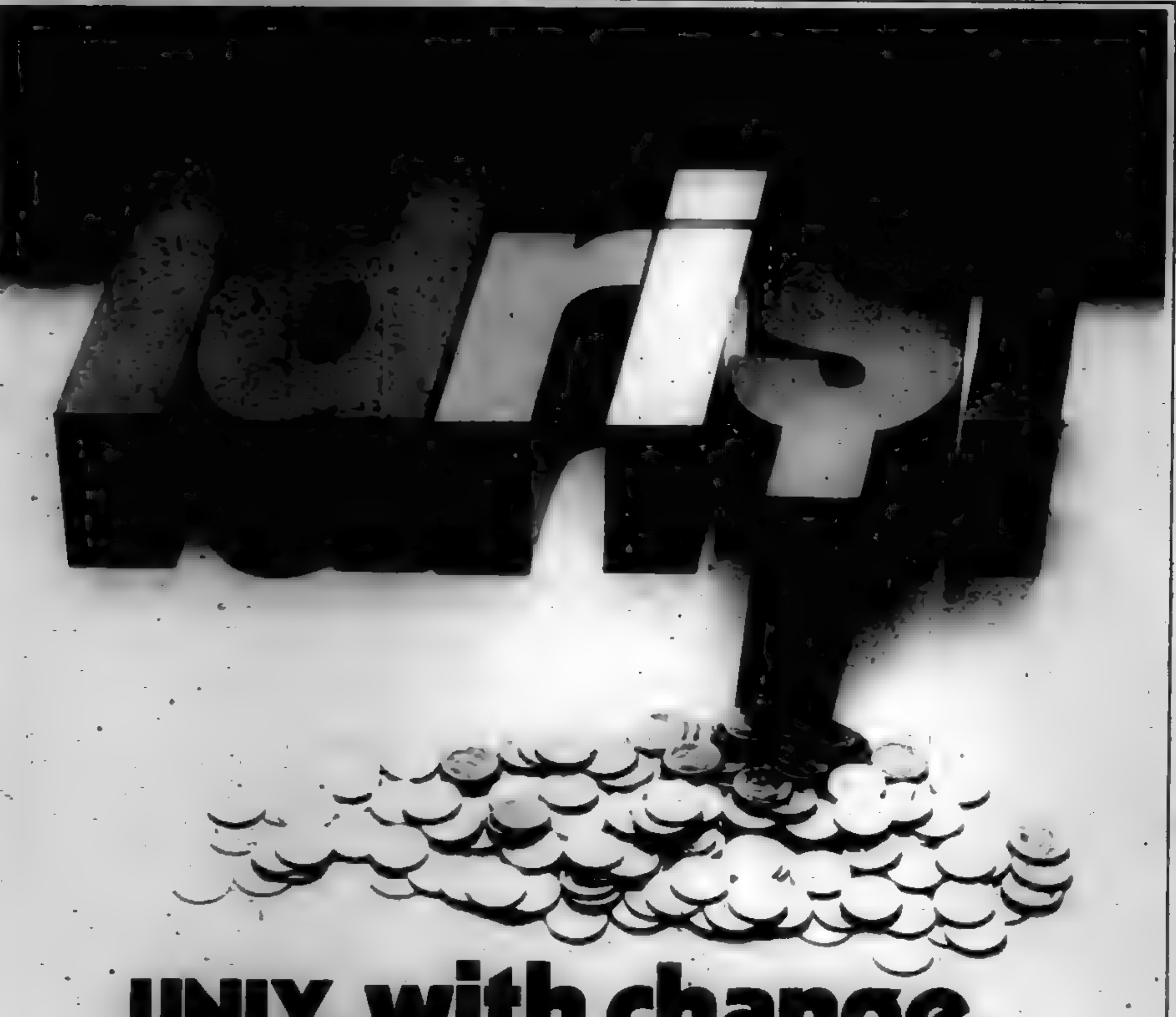
Zilog, Inc.'s Z8000 microprocessor now offers an option called **Mimix** that reportedly permits it to run both Bell Laboratories Unix-based and Digital Research, Inc. CP/M-based software programs. This option is priced at $1,000, the vendor said from 1315 Dell Ave., Campbell, Calif. 95008.

Unisoft Systems Corp. has announced a version of Bell Laboratories Unix operating system software for the Apple Computer, Inc. Lisa personal computer. **Uniplus** costs $750, the vendor said from 2405 Fourth St., Berkeley, Calif. 94710.

Science Management Corp. (SMC) has announced that its **SMC Business Basic** interpreter is available for Apple Computer, Inc.'s Lisa microcomputer.

SMC Basic is compatible with Microsoft Corp.'s Xenix operating system and was designed to work in conjunction with accounting software developed by Open Systems, Inc., SMC said. The suggested retail price for SMC Business Basic is $395 and is marketed through Open Systems, Inc. at 430 Oak Grove, Minneapolis, Minn. 55403.





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Connects DPS 6 to IBM Network

Honeywell Introduces SNA Release 1.1

WALTHAM, Mass. — Honeywell, Inc. has introduced an enhanced version of its software package designed to connect the Honeywell DPS 6 to an IBM Systems Network Architecture (SNA) network. The level of compatibility is said to permit concurrent use of IBM's Binary Synchronous Communication (BSC), SNA and Honeywell networking protocols for both interactive and batch processing, while providing local office automation, transaction processing, data entry, program development and other functions.

The enhancement, called SNA Release 1.1, includes the addition of an SNA file transmission facility and simplification of Honeywell's existing SNA interactive and SNA remote job entry (RJE) facilities, a vendor spokesman said. The SNA file transmission facility allows the user to exchange large volumes of data and control information and programs between IBM host processors and DPS 6 minicomputers.

The enhanced Honeywell SNA facility will be available in May. The host program product annual license fee is $2,435 and the DPS 6 program product annual primary license fee is $75. The annual primary license fee for the enhanced SNA interactive facility is $235, $355 for the enhanced RJE facility and $290 for SNA transport — an existing prerequisite for all Honeywell SNA products.

(Continued on Page 52)

Intersil Option Out For 8270 System

SUNNYVALE, Calif. — Intersil Systems, Inc. has released the Information Processing Option (IPO) for its 8270 Information Display System, described by the vendor as a package solution to users needing the function and reliability of IBM 3270 series equipment with more flexibility for expansion.

IPO is said to provide the IBM mainframe user with the ability to process data locally at an IBM 3270-type CRT terminal while still using the large host computer for other tasks.

The basic IPO unit comes with 1M byte of unformatted floppy disk storage, printer and Winchester disk interfaces and connects to the 8278-2 display station. With the IPO, the user reportedly receives a standard software package: Digital Research, Inc.'s CP/M; Microsoft, Inc.'s Basic-80 Interpreter; Perfect Software's Perfect Writer word processor, Perfect Speller spelling checker, Perfect Filer file management and Perfect Calc spreadsheet analyzer. Optional software packages include Microsoft's Macro-80 macro assembler, Basic compiler, Fortran-80, Cobol and Digital Research's Pascal MT+.

The price of a basic system, consisting of a 8278-2 terminal, IPO processing unit and standard software package, is under $3,500. Intersil Systems is located at 1275 Hammerwood Ave., Sunnyvale, Calif. 94086.

Northern Telecom Adds Model Of Displayphone for SL-1 PBX

NASHVILLE, Tenn. — Northern Telecom, Inc. has taken the wraps off a new model of its Displayphone that is designed specifically for use with the firm's SL-1 private branch exchange (PBX).

The SL-1 Displayphone' is an integrated voice and data terminal that reportedly combines features of the SL-1 telephone with those of the Displayphone. It allows managers, professionals and other knowledge workers to use computerized information resources and electronic mail systems by means of a video screen and keyboard, according to a vendor spokesman.

It includes a 7-in. video screen, retractable keyboard and a telephone handset for voice communications. A conversation can take place while information appears on the screen.

It provides simultaneous voice and data communications and offers a message-waiting indicator, conferencing and ring-again, which notifies the user when a busy extension is free, the spokesman said. The SL-1 Displayphone can communicate wih terminals connected to other asynchronous SL-1 data interface devices.

Data calls can be dialed automatically

(Continued on Page 58)

Acces Add-On Compatible With Ethernet Controllers

SOQUEL, Calif. — Associated Computer Consultants (ACC) has released an addition to its ACC Exchange System (Acces) — the Network Systems (NS) Protocol Package said to be compatible with many Ethernet controllers, including ACC's programmable Ethernet controller, IF-11/Ethernet.

The NS Protocol Package reportedly implements the Xerox Corp. Network Systems protocols in a strictly layered manner, offering the application programmer the ability to name, locate and utilize high-level processing services in a distributed environment.

Package features include support of Digital Equipment Corp. PDP-11 or VAX-11 and Bell Laboratories Unix, RSX or VMS operating systems; implementation through Level 3 of the Xerox Network Systems Protocols (OSI layer 6); C language interface at multiple levels of the NS protocol; as well as multiple user access.

Two versions of the NS package are offered. The first, NU-11/NS, is a host-resident package, which reportedly implements the NS Protocol Package through the Courier level (OSI model layer 6). All

(Continued on Page 58)

Amdahl Unveils Series of TDMs

SUNNYVALE, Calif. — Amdahl Corp. has announced a series of time division multiplexers said to concentrate up to 96 channels of data over a single, high-speed trunk facility.

The microprocessor-based 2211 series reportedly provides network management and monitoring capabilities that permit on-line reconfiguration, alarm monitoring and system diagnostics at one location.

The series offers the user the ability to multiplex different types and mixes of synchronous and asynchronous data from a variety of information resources.

The series price ranges from under $10,000 to $50,000, depending on configuration from Amdahl, 1250 E. Arques Ave., P.O. Box 470, Sunnyvale, Calif. 94086.

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For Datavox Deskset

Cluster Controller Announced

MERRIMACK, N.H. — Datavox Communications Corp. has released a modular cluster controller for its Executive/Professional Deskset.

The Model 3270 is a single, eight-port device that reportedly can:

- Function as a single IBM 3274-51C replacement, eight-port controller, for use with Datavox Desksets.
- Function as a coaxial cable eliminator, permitting up to seven IBM 3270-type devices to share a single cable with no degradation of performance. This feature can result in a reduction by as much as 84% of the long cable runs normally required. It is also said to permit individual terminals and printers to be located as far as 10,000 feet from the controller.
- In combination with other Datavox controllers, function as a 3274-21C or 3274-31C replacement controller, for support of up to 32 terminals and printers.

The principal advantage of this product is the level of user flexibility. The modular design reportedly also reduces terminal downtime.

With software, the Model 3270 Cluster Controller costs $3,880 from the vendor, 6 Continental Blvd., P.O. Box 328, Merrimack, N.H. 03054.

Controller Fits DDD Net

SAN JOSE, Calif. — Backus Data Systems, Inc. has introduced a combination modem/error controller said to feature autodial capability for direct distance dialing (DDD) fallback.

The Data Integrity System provides for transmission of asynchronous or synchronous data over either leased lines or AT&T's DDD network. The intelligent error controllers are offered in a variety of configurations, ranging from a two-port dial-up system with included 1,200 bit/sec modem, to a six-port network control station designed to handle a combination of leased lines, dial-up fallback modems and a video display monitor.

The two-port system without a modem is $1,150. The four-port system including the modem costs $1,795, and the six-port version sells for $1,995 from Backus Data Systems, Suite 110, 1440 Koll Circle, San Jose, Calif. 95112.

SNA Release Announced

(Continued from Page 51)

All Honeywell SNA facilities execute under control of its Gcos 6 MOD 400 operating system, which has been enhanced in Release 3.0, Honeywell also announced. In addition to providing enhanced SNA compatibility, it is said to feature data base management capabilities, support of Pascal and expanded transaction processing. Release 3.0 of the MOD 400 is available now for an annual license fee of $2,500 and related products will be available in June.

Honeywell's Office Automation Systems (OAS) Release 2.1, which runs under the enhanced operating system, was also introduced recently. It supports a menu-driven OAS document transfer said to allow users to utilize Honeywell's Distributed Systems Architecture, as well as SNA and BSC, the vendor said.

The OAS Release 2.1 will be available in April for an annual primary license fee of $1,710.

More information is available from Honeywell, 200 Smith St., Waltham, Mass. 02154.

Modemsplus Introduces SNA/SDLC Converter

DECATUR, Ga. — Modemsplus, Inc. has announced an IBM Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) protocol converter said to allow the use of both bit-oriented and character-oriented protocols, either separately or combined.

The Synchronous/Asynchronous Multiprotocol Remote Terminal Emulator (Smrte One) reportedly provides four serial ports and one receive-only printer parallel port and can convert SDLC to Bisynch or SDLC to Ascii. Any serial port may be used as the main I/O, while the other ports may be configured uniquely as required by the attached hardware.

The Smrte One also features, according to the vendor, a 24-char. LCD. The display calls up the main menu, which includes protocol desired, port location, transmission rate, device selection and diagnostic routines.

The unit price for the Smrte One is $3,995 from Modemsplus, 217 E. Trinity Place, Decatur, Ga. 30030.

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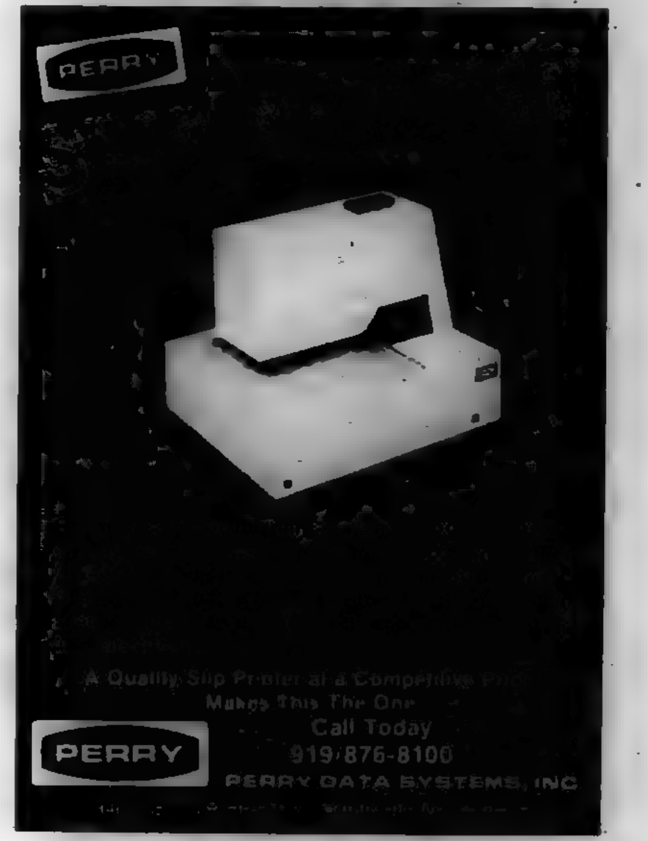
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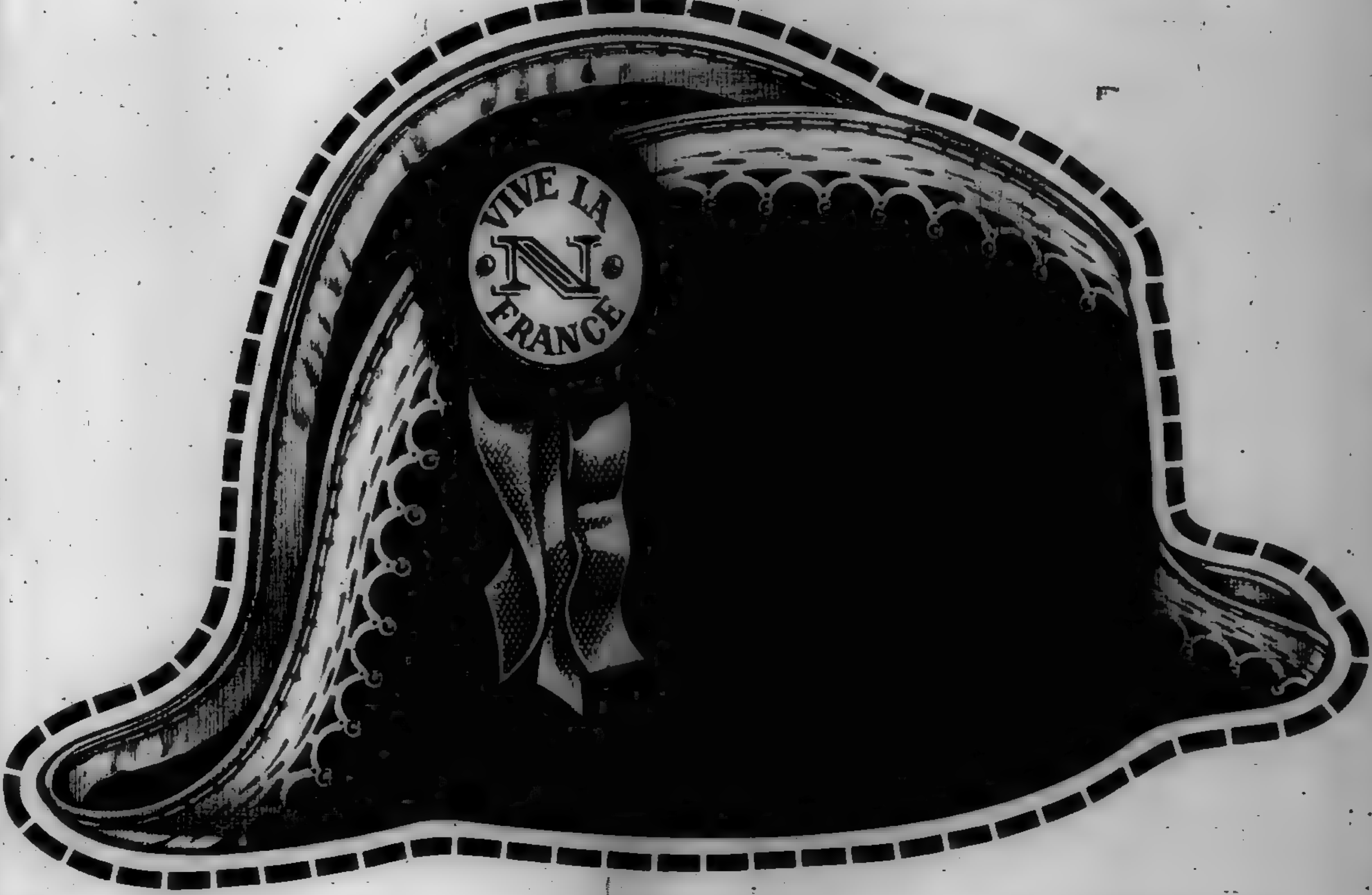

If you're looking for productivity and performance in a database management system, (and who isn't?), you really only have two choices. Buy MODEL 204 DBMS from us at Computer Corporation of America. Or have a very good story ready for why you didn't.

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MODEL 204 is the only commercial DBMS ever designed from scratch for on-line systems. Every other DBMS was converted from batch to on-line. And that means new applications come up faster with MODEL 204 and are easier to maintain.

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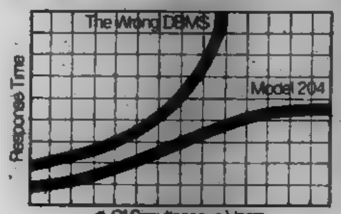

And if all else fails?

Well, you can always cut out our little hat, and plead temporary insanity. Which, inexcusable as it seems, may actually be close to the truth.

Faced with the obvious superiority of MODEL 204 DBMS, you'd have to be crazy to buy anything else.

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it will be impossible to make an informed decision on software without talking to Cullinet.

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Three Versions Offered

'Teleterm' Targets Micros

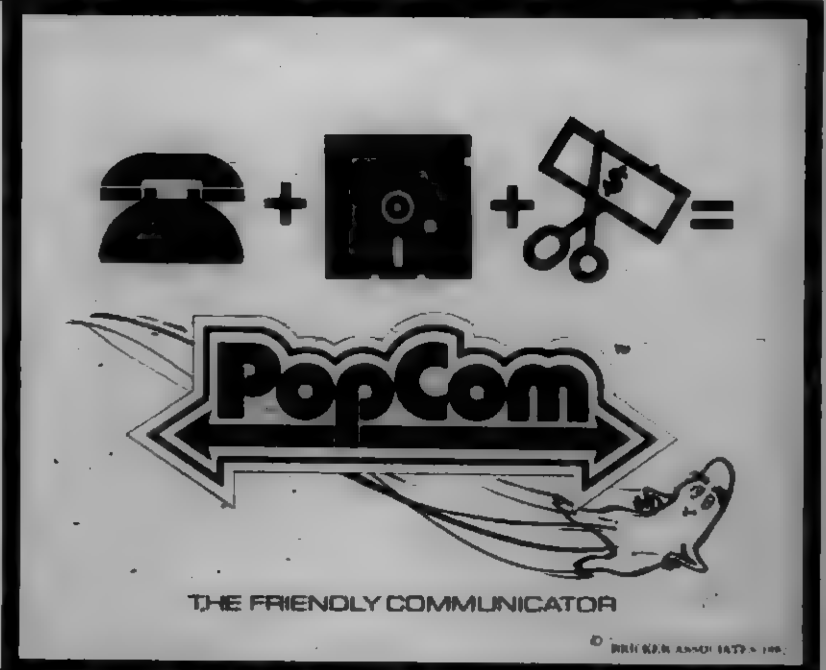
WILLINGBORO, N.J. — Telexpress, Inc. has released three versions of Teleterm, the Telexpress communications system software.

Teleterm is an intelligent terminal software package that reportedly allows the user to use a microcomputer for asynchronous communications through an RS-232C link over telephone lines, through a protocol converter or directly wired to another computer.

Teleterm features include the ability to download and upload files directly from disk-to-disk between Teleterm systems, file transmission directly from disk, on-line/off-line text editor and Videotex Control Code support for accessing time-sharing services.

Two of the new versions are for the Radio Shack TRS-80 Model II/16 and the newly released TRS-80 Model 12 and a Digital Research, Inc. CP/M version for the Model II. A third version for the IBM Personal Computer running under PC-DOS will be released in March.

Pricing for the Teleterm system is $89.95 for the IBM Personal Computer versions and $165 for the Model II/16, the Model 12 and the CP/M versions. More information is available from Telexpress through P.O. Box 217, Willingboro, N.J. 08046.



SW10 Emulates DEC VT100

TUSTIN, Calif. — General Terminal Corp. has introduced a low-cost alternative to the Digital Equipment Corp. VT100 featuring a VT100 look-alike keyboard.

The SW10 has eight programmable function keys, each of which can reportedly store up to 20 characters. The unit includes a printer port with passthrough capabilities accommodating 132-col. printing operations while recognizing a "printer busy" signal.

Standard equipment includes 20 mA current loop, English-language setup mode, graphics character set, slow scroll and split screen, according to the vendor.

The terminal costs $849 from the vendor at 14831 Franklin Ave., Tustin, Calif. 92680.

DSU Buffers Link Bell's DDS

NEWPORT, R.I. — Avanti Communications Corp. has introduced two Digital Service Unit (DSU) buffers designed to join Bell system Dataphone Digital Service (DDS) links together. The company also announced two new features for its family of Local Area Data Distributors (Ladd).

The Models 832 and 835 DSU Interconnect Buffers reportedly will allow users who currently have DDS lines to expand utilization of lines used in their communications network. The 832 interconnects DDS link operating with an RS-232 interface at data transmission rates of 2,400, 2,800 and 9,600 bit/sec.

The Models 832 and 835 DSU Interconnect Buffers are priced at $1,750 each.

The first addition to Ladd, the 2214 feature for military interfacing applications, provides MIL 8/114 interface capabilities for the 2200 and 2300 Ladd. It costs $300. The second feature, the 2370 feature, allows the 2300 Ladd to interconnect terminal equipment operating at a data rate of 722K bit/sec with a Bell T1 carrier operating at a line rate of 1.544M bit/sec. The 2370 feature is available on all 2300 models operating with a V.35 interface at a data rate of 1.544M bit/sec. It costs $250 from Avanti, located at Aquidneck Industrial Park, Newport R.I. 02840.

Shared DASD users, don't leave your data integrity to chance.

Protect it with Super-MSI™,
the integrity protection package designed exclusively for multiple-CPU environments.

Easy to install. Easy to maintain. Super-MSI requires no modifications to your operating system and can be implemented in an active system in as little as ten minutes—assuring complete data integrity from the moment it is installed.

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Super-MSI preserves integrity under MVS, MVS-SE, MVS-SP, SVS, MVT, VS1 and MFT systems.

Super-MSI prevents data destruction.
Inadvertent modification, simultaneous access ...Super-MSI stops the damaging data abuses that multiply in a multi-systems environment. Prevents the errors that can so easily occur—and too often go undetected—when users operate in a multi-systems complex.

Super-MSI eliminates hardware RESERVEs.
Super-MSI completely protects your data integrity and frees your systems of RESERVEs and RESERVE lock-outs. Super-MSI converts selective RESERVEs to logical controls that securely protect your data without inhibiting system throughput.

Super-MSI does more.
As part of the CGA family of single-image software for multiple-CPU sites, Super-MSI works together with MSM*, our Multiple Systems Manager which manages tape and disk storage devices and GCD*, our Global Console Director which consolidates consoles, cutting costs and streamlining operations. The result is a unified single system image that is transparent, flexible and powerful. Use them together or in any combination. CGA's multiple systems software is a must for large users.

More than 1,000 CGA single-image software packages are in use around the world, preserving data integrity and helping multiple-CPU sites hum like they're supposed to. Call today. Set up a free trial of Super-MSI, GCD or MSM.

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There is an ongoing process that takes place in an office—a synergy between people, a unified flow that can be undermined by the well-intentioned act of automating your office.

Simply because people have a justifiable interest in not being overwhelmed by the technology that's supposed to serve them.

Which is why the following words should be of special interest to anyone deciding on an office automation system:

"What distinguishes Data General's office system from most of the competition is the integration of all functions in a single software package…CEO (the Comprehensive Electronic Office) is marked by the extent it works for the user instead of asking the user to work for it."—Editor, Electronic Message and Mail Systems.

In other words, you and your people can safely set aside your antiquated tools for word processing, data processing, scheduling, filing, communicating and generating reports and graphics.

With Data General's CEO™ system you perform all these basic information management functions electronically. Easily and effortlessly. With quantum leaps in productivity. Without the work environment ever taking a backseat to the technology.

For example, CEO Electronic Filing files the way you file. Each document has a folder. Each folder has a drawer. Each drawer has a cabinet. And there's an unlimited number of each.

There's an exclusive "Interrupt" feature that lets users instantly put a given job on hold, attend to something else, and then return to the original job without disruption. And you can even interrupt the Interrupt.

The system provides a "Help" button which summons up simple, yet specific operating instructions as needed—assisting your people in solving the problem at hand, without requiring them to wade through menus of irrelevant detail.

Your people can tailor CEO to their individual needs, the department's and the entire organization's. And there are ample security provisions for protecting sensitive material.

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OUT OF COMPUTERS.

Works Via Xerox X.25 Net

Conversion Package Out

WOODLAND HILLS, Calif. — Protocol Computers, Inc. (PCI) has released a protocol conversion package that converts Ascii to IBM System/34 and System/38 communications via Xerox Corp.'s X.25 public packet network.

The package reportedly offers an alternative to leased lines and permits microcomputers, personal computers, Ascii CRT terminals and hard-copy printers to replace IBM 5251 models 11 and 12 CRT terminals.

The conversion package consists of a pair of units, the 1051X and the 73SX. The 1051X interfaces between Ascii terminals and the X.25 node and provides the Ascii to IBM Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) to X.25 conversion. The 73SX performs SNA/SDLC to X.25 conversion on the System/34 to System/38 host side of the network.

The conversion units reportedly permit a maximum of 56 Ascii devices to function simultaneously through the X.25 network emulating 5251 CRT terminals and 5256 printers. The 73SX supports up to eight virtual circuits with each circuit supporting one 1051X.

The PCI 1051X ranges from $4,500 for one port to $8,500 for seven ports. The 73SX is $5,500. PCI is located at Suite 100, 6150 Canoga Ave., Woodland Hills, Calif. 91367.

Domain Net Gets Processor

CHELMSFORD, Mass. — Apollo Computer, Inc. has announced a server processor for peripherals and communications that reportedly expands its Domain network's resource-sharing capabilities and improves local nodes' computational performance.

The Domain Server Processor 80 includes a 32-bit very large-scale integration central processor, up to 1.5M bytes of main memory, a subset of Apollo's Aegis network-wide virtual memory operating system and a five-slot Intel Corp. Multibus card cage, according to a vendor spokesman.

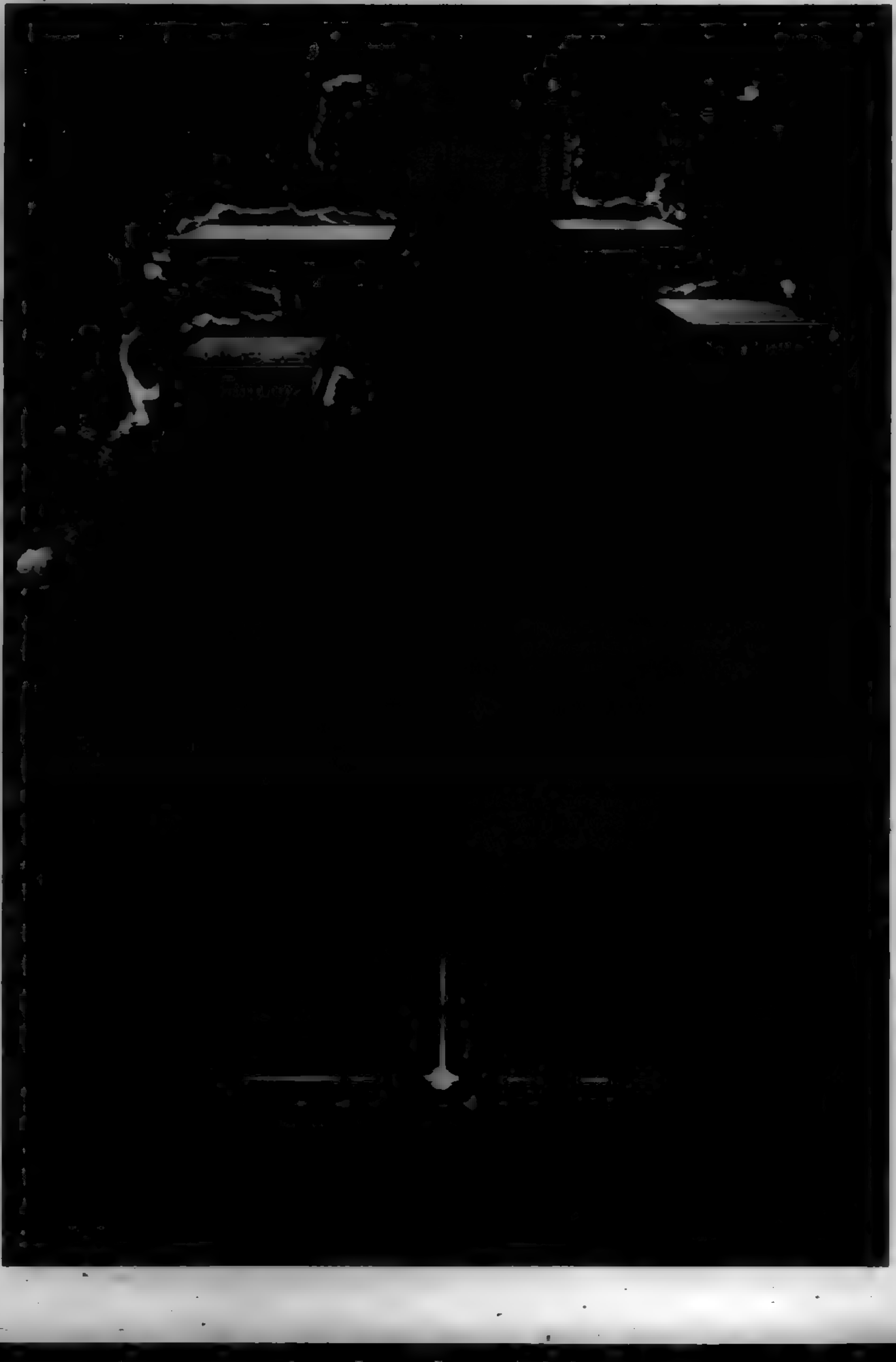
Prices start at $7,000 for a .5M-byte configuration. The company is located at 15 Elizabeth Drive, Chelmsford, Mass. 01824.

Transmodem 1200 Features Autodial

SAN JOSE, Calif. — SSM Microcomputer Products, Inc. has announced Transmodem 1200, a 110- to 1,200 bit/sec full-duplex modem.

Features of the unit include autoanswer/autodial, automatic speed detection, Touch-Tone and pulse dialing and logon password storage. The unit can be used with any processor with an RS-232 interface, the vendor said.

The Transmodem 1200 costs $695, the vendor said from 2190 Paragon Drive, San Jose, Calif. 95131.



ACC Introduces Acces Addition

(Continued from Page 51)

NS software modules reside in the host computer. One of these modules, the Network Interface Module (NIM), communicates with network hardware via the host's bus and appears in the system as an I/O driver. By choosing an appropriate NIM, the NS package can be configured to operate with hardware from a variety of vendors, a vendor spokesman said.

The second version, FE-11/NS, is said to incorporate virtually the entire NS Protocol Package into ACC's IF-11/Ethernet. This version draws upon the benefits of a dedicated front-end processor to increase network performance and to reduce the host's processing overhead, the spokesman reported.

The NU-11/NS costs $4,500 each and the the FE-11/NS costs $9,500 each. ACC is located at 2901 Park Ave., Soquel, Calif. 95073.

Displayphone Out for SL-1 PBX

(Continued from Page 51)

and the terminal conforms automatically. Computer logon codes can also be stored. Once the terminal is connected to a computer, the use of soft function keys can reportedly be customized for a particular application.

It has two display pages that show on the screen, one for voice and the other for data. Users can select and view either page without altering the contents or disrupting the service performed on the other.

The asynchronous data calls are placed on the data line, which provides a fully digital path through the SL-1 system at speeds of up to 1,200 bit/sec. The SL-1 Displayphone connects to the SL-1 PBX with standard twisted-pair cable, the vendor said..

As a data terminal, it operates like an asynchronous Ascii terminal and can be used in most applications where Ascii terminals are used. Because it transmits data digitally, no modems are required. However, modems reportedly can be pooled or shared by users for data calls outside the SL-1 system over the analog public telephone network.

The terminal will be available in April, Northern Telecom said from 259 Cumberland Bend, Nashville, Tenn. 37228.

Teleram Announces Trade-In Program

WHITE PLAINS, N.Y. — Teleram Communications Corp. has announced a major trade-in program.

Through March 31, the firm will accept the following products for trade-in against the purchase of Portabubble/81 portable/bureau terminals: Teleram B-1800, P-1800, P-1888 and 2277 terminals; Texas Instruments, Inc. 700 series terminals; and Telcon Industries, Inc. and Peripheral Systems, Inc. portable and bureau terminals.

Such a trade-in will be worth $900 toward the purchase of a Portabubble/81, bringing the price down to $4,495 from $5,395. Teleram is located at 2 Corporate Park Drive, White Plains, N.Y. 10604.

IBM 3101 Terminal Emulator Available for Displaywriter

DELRAY BEACH, Fla. — Advanced Software Products, Inc. has announced an emulator for the IBM 3101 terminal that is available for both the IBM Displaywriter and the IBM Personal Computer.

Both character and block mode 3101 terminals can be emulated. Advanced features include time and date stamping for printed screen images, a built-in communications trace facility and a 3101 feature editor intended to simplify the setup of the emulation sessions.

The 3101 emulator is available for both systems immediately and can be obtained on a trial basis for $25.00. A perpetual license is available for $300 per system and includes two years of releases and fixes, the vendor said from Tower B, 100 E. Linton Blvd., Delray Beach, Fla. 33444.

'Osmosis' Connects Unix to VMS

SUNNYVALE, Calif. — International Data Services, Inc. (IDS) has introduced a communications software package said to allow the University of California at Berkeley version of Bell Laboratories' Unix operating system to communicate with Digital Equipment Corp.'s VMS operating system. The package uses interface boards from Interlan, Inc.

Osmosis runs under the Xerox Corp. Ethernet local-area network. It is said to handle data formatting to allow the user to log on to a remote host and use the resources of that host as if the terminal were directly linked to it. It also converts text files so that the two hosts can read them in the appropriate format.

The package is available for $33,750 from IDS, 1020 Stewart Drive, Sunnyvale, Calif. 94086.

Voice Subsystem Boasts 100 Words

ANAHEIM, Calif. — Interstate Electronics Corp. has unveiled a voice recognition subsystem, compatible with most Ascii terminals, that is said to have a 100-word vocabulary and a 99+% accuracy rate.

The SYS300 Voice Recognition Subsystem connects to an RS-232C line between an Ascii terminal and host computer.

The price for most units is $1,995 from 1001 E. Ball Road, P.O. Box 3117, Anaheim, Calif. 92803.

'Tracs' Update Transfers Data

SACRAMENTO, Calif. — Software Module Marketing, Inc. (SMM) has introduced a communications software package said to allow the transfer of batch data between different binary synchronous computers and devices. The package runs under the IBM DOS and OS operating systems.

SMM/Tracs Release 1.6 is said to feature multiple line turnarounds in a single session to support interactive batch communications, full transparency mode to allow users to transmit packed or binary data to another site and autodial to allow minimum operator intervention.

The DOS version is available for $5,500.

The OS version is available for $8,000 from SMM, 1007 Seventh St., Sacramento, Calif. 95814.

Two Interfaces Released by HP

PALO ALTO, Calif. — Hewlett-Packard Co. has introduced two interface modules for the HP 64620S logic-state/software analyzer: a general-purpose interface and an Intel Corp. 8086/8088 microprocessor-dedicated interface. The interfaces, together with the HP 64500A general-purpose preprocessor, are said to simplify troubleshooting and optimize microprocessor systems.

The HP 64651A general purpose interface includes a breadboard, integrated circuit sockets, wire-wrap terminals and a cable with a processor socket for 40-, 48- or 64-pin dual in-line packages.

The HP 64651A general-purpose terface for the 8086/8088 is said to expand the current set of processor-specific interfaces.

The HP 64651A is available for $910 and the HP 64653A for $1,210 from HP, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Check to see how SEED® sets the standard for DBMS comparison.

Compare any DBMS with SEED for...	SEED DBMS	Other DBMS	Other DBMS
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Flexibility SEED's flexibility answers your demands for reduced programming, faster development and more efficient operation. SEED supports a variety of data base architectures.	✓		
"Smart" Decision Support Tools SEED's non-procedural decision support tools—HARVEST® query language, BLOOM® report writer, and Rainbow graphics get information out of a complex data base without the need for programming.	✓		
Application Development Tools SEED KERNEL® employs a dictionary to permit centralized definition of your data base contents. KERNEL lets you build custom applications with COBOL, FORTRAN, or Vista, the SEED screen formater. KERNEL utilities help you in tuning your application, speeding its development, ensuring its data reliability, loading the data base from files, and testing your data access algorithms.	✓		
Journaling and Security Facilities SEED's journaling capability keeps your data base uncorrupted. SEED also adds its own security features to those of your host computer to protect your information from unauthorized access.	✓		
Service We put experienced professionals at your disposal. Through a telephone hotline, you have access to an extensive consulting team, personalized on-going support and maintenance.	✓		

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- What Is PC Compatibility?

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PC WORLD Day March 19 Program of Events:

Located in the Ballroom of the San Franciscan Hotel, one block from Brooks Hall, San Francisco.

9:30–10:30 a.m.
"Systems Software for the PC"
Panel members: Gary Kildall, President, Digital Research; Chris Larson, Director of Marketing, Microsoft; David Hughes, Independent Consultant; Syd Geraghty, President, Quantum Software; C.A. Irvine, Vice President of Engineering, SofTech Systems; Kearney Rietmann, Associate Editor, *PC World.*

11:00–12:00 p.m.
"The PC Phenomenon"
Panel members: David Bunnell, President and Publisher, *PC World*; Cheryl Woodard, Associate Publisher, *PC World*; Ron Posner, Chairman, National Training Systems; Portia Isaacson, President, Future Computing; Martin Alpert, President, Tecmar.

12:30–2:00 p.m.
"Second Generation Software"
Panel members: Mitchell Kapor, President, Lotus Development Corp.; Jeff Harbers, Associate Manager, End-User Division, Microsoft; Gilbert Hoxie, President, Context Management Corp.; Roy Folk, Division Marketing Manager, VisiCorp; Harry Miller, Associate Editor, *PC World.*

2:30–4:00 p.m.
"PC Multiprocessing, Networking, and Communications"
Panel members: Drew Major, Software Systems Manager, Novell Data Systems; Steve Pomeroy, Product Marketing Manager, 3COM; Steven Cook, Technical Editor, *PC World*; Phil Belanger, Omni Project Manager, Corvus.

4:30–6:00 p.m.
"PC Add-Ons—What Is Compatibility?"
Panel members: Rod Canion, President, COMPAQ Computer Corp.; Andrew Fluegelman, Editor, *PC World*; Dr. Robert Harp, Chairman of the Board, Corona Data Systems; Karl Koessel, Programming Editor, *PC World*; Steven Cook, Technical Editor, *PC World*; Martin Alpert, President, Tecmar.

The West Coast Computer Faire Is March 18, 19, 20

For pre-registration at a discount for 10 or more call Computer Faire (415) 851-7077. Registration at the door for 3 days including conference program and show is $15.

Don't Miss PC WORLD Day March 19

Attendance at PC WORLD Day events is free to all participants in the West Coast Computer Faire, but space is limited to the first 500 persons so please come early to ensure you don't miss PC WORLD's presentations.

Also, visit the PC WORLD booth at Brooks Hall. Booth numbers: 1127, 1129, 1131.

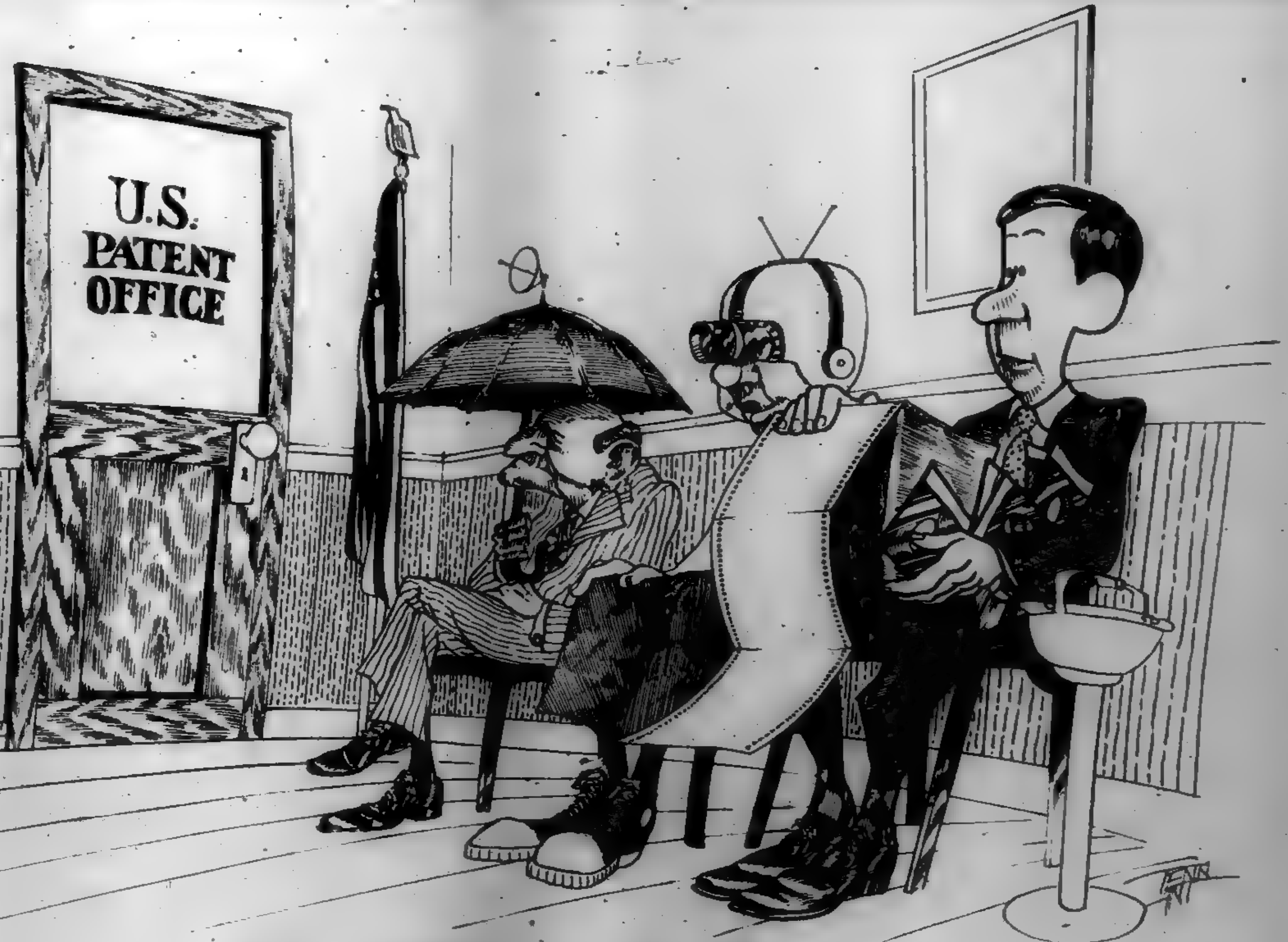

ILLUSTRATION BY RICHARD TENNANT

A Guide to Patenting Software

By Delbert L. Keenon and Norman R. Carlson

The U.S. Patent Office has begun issuing software patents, eliminating a particularly frustrating enigma to programmers. Following the U.S. Supreme Court's decision in Diamond vs. Diehr in March 1981, the U.S. Patent and Trademark Office has adopted a receptive attitude toward patent applications related to software program inventions. Prior to the Diehr decision, the office held steadfastly that such inventions were unpatentable. Since the decision, the office has issued several software patents, beginning in January 1982.

The Diehr decision has had a far greater effect than merely revising the Patent Office's attitude toward software inventions. The decision has created an altogether new class of inventors. They work in an environment that is unfamiliar to the patent field, and their products are different in nature from mechanical, electrical and computer hardware inventions.

In view of the new possibilities for patenting software program inventions, software creators need to understand the spirit and purpose of the U.S. patent system, the essential parts of a U.S. patent and how features of software programs may be patented and licensed for income that enjoys the tax protection of long-term capital gains.

Essentially, a U.S. patent is a contract between the U.S. government (representing the U.S. public) and the inventor. A patent confers upon its inventor an exclusionary

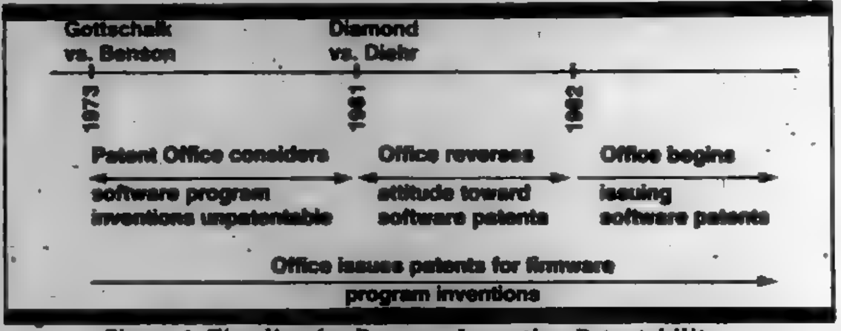
Gottschalk vs. Benson
Diamond vs. Diehr
1973
1981
1982
Patent Office considers software program inventions unpatentable
Office reverses attitude toward software patents
Office begins issuing software patents
Office issues patents for firmware program inventions

Figure 1. Timeline for Program Invention Patentability

right — that is, the right to exclude members of the public from making, using or selling the invention. But this right is not conferred upon the inventor forever. In general, it "dies" 17 years after the patent is issued. After the right expires, anyone may use or sell the invention, and its creator is powerless to exclude the public from such practice.

In exchange for this exclusionary right, the inventor must disclose (within the patent) enough information to enable a public member to make and use the patented invention. This requirement is sometimes known as an "enabling disclosure."

It is not necessary to enable *any* member of the public to make and use the invention. Instead, the disclosed information must enable one of *ordinary skill in the art of the invention*. The disclosure of a patent for an analog-to-digital (A/D) converter need not be enabling for a mechanical engineer who designs automatic transmissions, for example. In this case, the engineer does not possess an ordinary level of skill in the A/D art.

As another example, the disclosure of the patent for the A/D converter need not be enabling for an electronics engineer with no prior education or experience with A/D converters. Again, this person does not possess ordinary skill in the A/D art. On the other hand, the disclosure must be enabling with respect to any person familiar with A/D converters — for example, someone who designs them.

Promoting Progress of the Art

By making an enabling disclosure, an inventor enhances the public's awareness of the progress of the art. In this way, the art's progress is promoted more than if inventions were kept secret.

Patents relating to software program inventions are comprised of three essential parts: a body of text called the specification; a set of drawing figures; and at least one claim — usually there are several.

Specification. The specification is a printed text that indicates the invention's field and describes problems the invention solves. It usually emphasizes the advantages that arise from using the invention. Typical advantages include reduced cost, increased speed, improved productivity or greater accuracy. Often, the specification describes the invention's theory of operation — in other words, how the invention accomplishes its purpose. A well-written specification teaches the reader how the invention achieves advantages not previously attained by the related art.

Drawing figures. Most patents use drawing figures to help the specification describe how the invention is built and how it is used. In software program patents, flowcharts are common. Lists of computer and assembly-level programs may also appear among the drawing figures. Other figures may be used to convey the heart of the invention — the principle under which the invention functions.

Claim(s). A claim is a word picture that defines the invention. When there are several claims, they vary in detail. Usually, the least detailed claim appears first and is the broadest or most comprehensive.

From the point of view of patent law, the invention exists only as it is

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The OZ 225 Network Modem boasts the most comprehensive set of automated and user-friendly features available today. Once its multiple directories are created and linked, a simple command dials the number, logs you on, and verifies the response, without tying up either the operator or the computer. Call abort, retry and alternate number dialing are also totally automatic. OZ 225 can store up to ten times the numbers of any competitor. And because it is compatible with non-Bell as well as 212A environments, connection through intermediate networks like MCI and SPRINT® is hassle-free.

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The OZ 225 is the most powerful network modem you can buy. Which means, bottom line, it's the most economical network modem you can buy. Twin microprocessors, 16K of battery backed-up memory, up to 9600 baud to and from the DTE, bi-directional speed buffering, and Flow Control all translate into faster system throughput and greater staff output. Displays come up more promptly. You get on and off the computer more quickly. You save on dial-ups, minimize screw-ups and free up expensive CPU and phone line resources.

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defined by the claims. The invention is not found in the inventor's notebook, nor in a prototype of the invention before its manufacture, nor in a commercially available manufactured object that embodies the inventive principle.

Fundamentally, the claims define exactly what the public is excluded from making, using or selling. Therefore, claims must be clear and concise. Moreover, the claims are the vehicle for licensing others to make, use and sell the invention. If the claims are properly licensed, they permit the inventor or patent owner to enjoy licensing fees (royalties) that qualify as long-term capital gains. In this event, the royalties are taxed at a lower rate than ordinary income.

Historical Development

The history of software patents centers on two landmark Supreme Court decisions. In the first, Gottschalk vs. Benson (1973), the court held that claims for an algorithm used in a digital computer to convert binary code decimal numbers to equivalent pure binary numbers were unpatentable. In the second case, Diamond vs. Diehr (1981), the court held that claims for a method of operating a rubber molding press, in which parts of the method are performed by a programmed digital computer, were patentable.

In the Benson decision, the court defined an algorithm as a "procedure for solving a given type of mathematical problem" and reasoned that such an algorithm is like a law of nature, which cannot be the subject of a patent. Therefore, the court concluded, the Benson claims were unpatentable.

The court adhered to its principle that laws of nature, physical phenomena and abstract ideas are excluded from patent protection. Naturally occurring minerals and plants also fall within this group, as do mathematical equations that express laws of nature — for example, $E = mc^2$.

The U.S. Patent and Trademark Office held steadfastly that the Benson decision meant *software* program inventions were unpatentable. Nevertheless, the Patent Office did not oppose issuing patents for inventions that arose in *firmware* programs (see Figure 1).

In the Diehr decision, the court considered claims for a method of operating a rubber molding press for precision-molded rubber compounds. The method is carried out with the aid of a (software) programmed digital computer. When an article is placed inside the press for curing under heat and pressure, an interval timer in the computer is initiated as the press is closed. During the curing process, the computer repeatedly monitors the temperature at a location within the press and close to the mold cavity.

The computer stores data pertaining to the geometry of the mold and the batch of rubber being molded. Each time a temperature value is observed, the computer uses that value with the stored data and a mathematical equation to calculate the total required curing time. In

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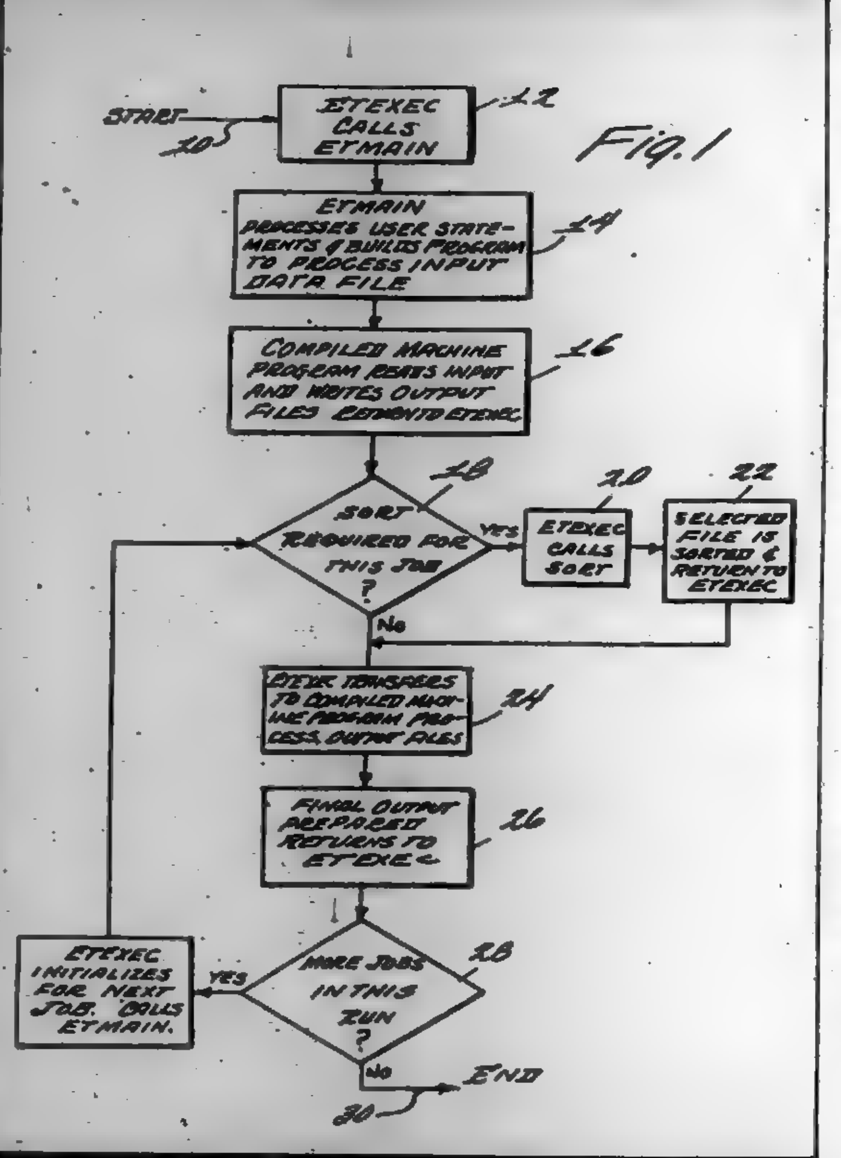

START
10
ETEXEC CALLS ETMAIN
12
Fig. 1
ETMAIN PROCESSES USER STATEMENTS & BUILDS PROGRAM TO PROCESS INPUT DATA FILE
14
COMPILED MACHINE PROGRAM READS INPUT AND WRITES OUTPUT FILES RETURNS TO ETEXEC
16
18
SORT REQUIRED FOR THIS JOB ?
YES
20
ETEXEC CALLS SORT
22
SELECTED FILE IS SORTED & RETURN TO ETEXEC
No
ETEXEC TRANSFERS TO COMPILED MACHINE PROGRAM PROCESS, OUTPUT FILES
24
FINAL OUTPUT PREPARED RETURNS TO ETEXEC
26
ETEXEC INITIALIZES FOR NEXT JOB. CALLS ETMAIN.
YES
MORE JOBS IN THIS RUN ?
28
No
END
30

Figure 2

other words, the computer calculates the total time that the press should be closed to complete the cure. When the calculated cure time and the elapsed time since closure of the press are the same, the press opens automatically.

The court reasoned that the Diehr claims "were not directed to a mathematical algorithm or an improved method of calculation, but rather recited an improved process for molding rubber articles by solving a practical problem which had arisen." Therefore, the court concluded that the Diehr claims were patentable.

In its opinion, the court defined a process as "a mode of treatment of certain materials to produce a given result. It is an act, or series of acts, performed upon the subject matter to be transformed or reduced to a different state or thing. If new and useful, it is just as patentable as is a piece of machinery. The process requires that certain things should be done with certain substances and in certain order."

Typical Software Patents

The following examples show the variety and nature of some of the software patents issued in the past year. In some cases, the inventors are independent; in others, they represent large corporate employers. The figures are taken from the patents themselves. Two patents to independent vendors are considered first.

Compiler improvements. In January 1982, the Patent Office issued what is considered to be the first software patent to an independent inventor, Robert I. Beckler (U.S. Pat. No. 4,309,756). This patent concerns an improvement in compilers that convert from source code to object code in a single step. The claims define a method for use under program control in a digital computer.

This method constructs an array of logical linkages that permits direct compilation of an efficient and optimum-size set of machine-executable instructions. These instructions evaluate compiler-level logic condition sets without constructing the usual logic decision tables. The resulting set of instructions is nearly optimum in terms of both the core storage area used and the object program execution time (see Figure 2).

Securities valuation system. In June 1982, the Patent Office issued a patent for a securities valuation system to Frederick C. Towers (U.S. Pat. No. 4,334,270). This patent discloses a method of operating a general-purpose digital computer to produce securities portfolio valuation schedules for several simultaneous users. The computer maintains securities information in systemwide files that are updated, both electronically and

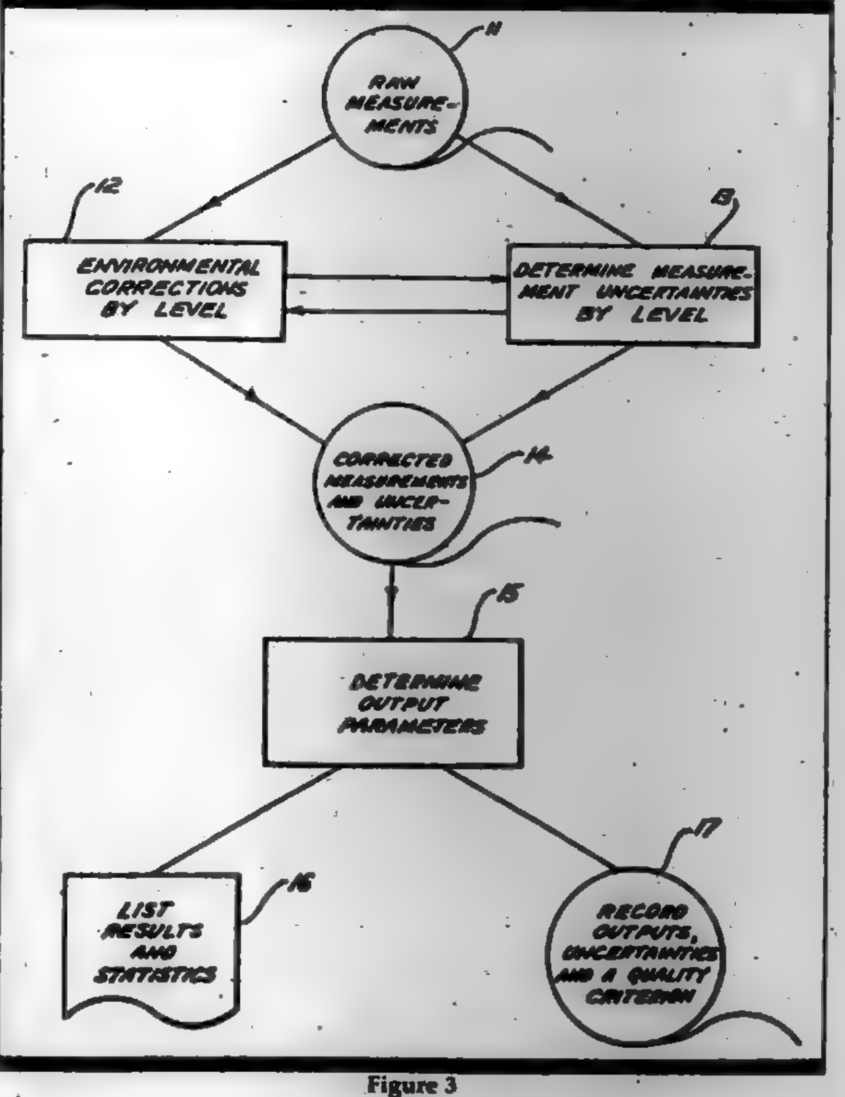
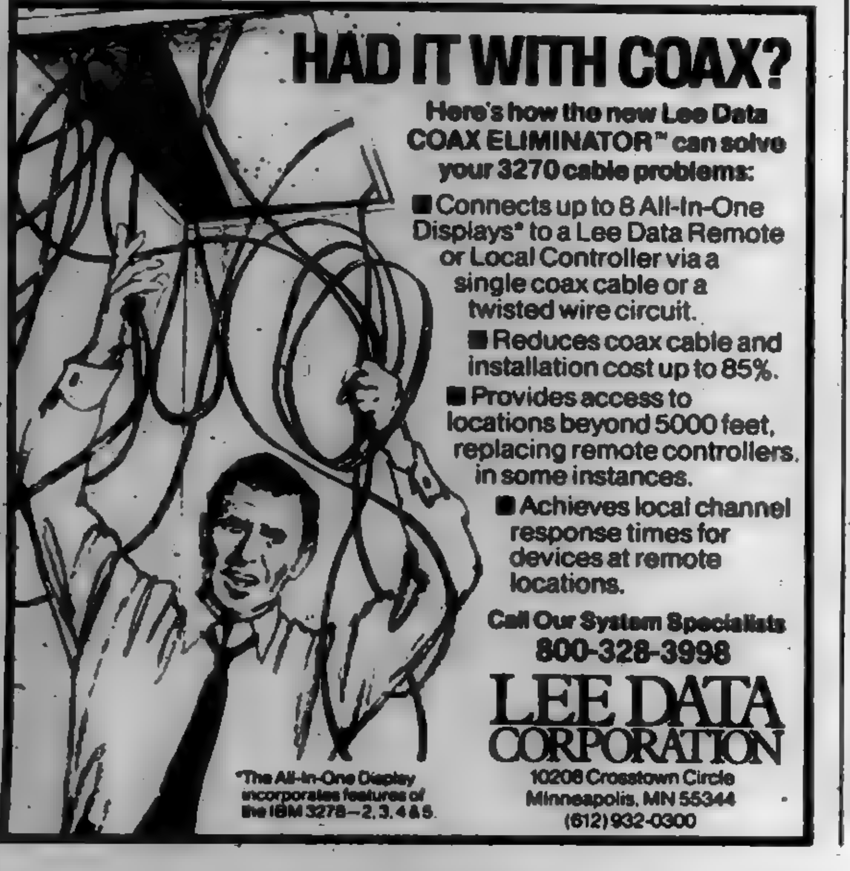

11
RAW MEASUREMENTS
12
ENVIRONMENTAL CORRECTIONS BY LEVEL
13
DETERMINE MEASUREMENT UNCERTAINTIES BY LEVEL
CORRECTED MEASUREMENTS AND UNCERTAINTIES
14
15
DETERMINE OUTPUT PARAMETERS
16
LIST RESULTS AND STATISTICS
17
RECORD OUTPUTS, UNCERTAINTIES AND A QUALITY CRITERION

Figure 3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manually, on a daily basis. The system permits each user to store information about his portfolio, as well as information about supplemental securities not included in the system-wide files.

The next two examples concern software patents whose inventors are employed by large corporations.

Method of evaluating formations. After drilling a well through geological formations that may bear producible hydrocarbons, various instruments are placed in the well before casing is installed. These instruments record initial data that may be processed to yield desired output parameters. The parameters are more useful in determining the presence of hydrocarbons than are the initial measurements. If the output parameters are indicative of producible hydrocarbons, casing is installed and the well is produced.

This patent (No. 4,338,664) discloses a method of processing the initial data to derive a set of output parameters that minimize weighted deviations between the actual measurements and values of the measurements calculated from the output parameters. This minimization gives the most probable output parameters, whose uncertainty is in turn calculated. The computed values of the measurements are plotted alongside an indication of the range of uncertainty of the actual measurements. This comparison provides an indication of the reliability of the derived output parameters, which are also plotted with or without their own range of uncertainties (see Figure 3).

Method for automatically correcting spelling errors. This patent (No. 4,355,371) discloses a system for matching a misspelled word against various candidates from a dictionary to find the best match of the misspelled word. The major facility offered is the ability to discern the degree of apparent similarity between words that do not perfectly match a given target word without requiring the tedious procedure of character-by-character positional matching. Such matching requires shifting and realignment to accommodate for differences between the candidate and target words.

The system includes a method for storing and retrieving words from a dictionary based on their likelihood of being the correct version of a misspelled word. The words are reviewed to reduce further the number of candidates that must later be examined in a high-resolution positional match to find the candidate with the greatest character affinity. The technique reduces the number of candidates in contention in order to make a high-resolution match feasible on a real-time basis (see Figure 4).

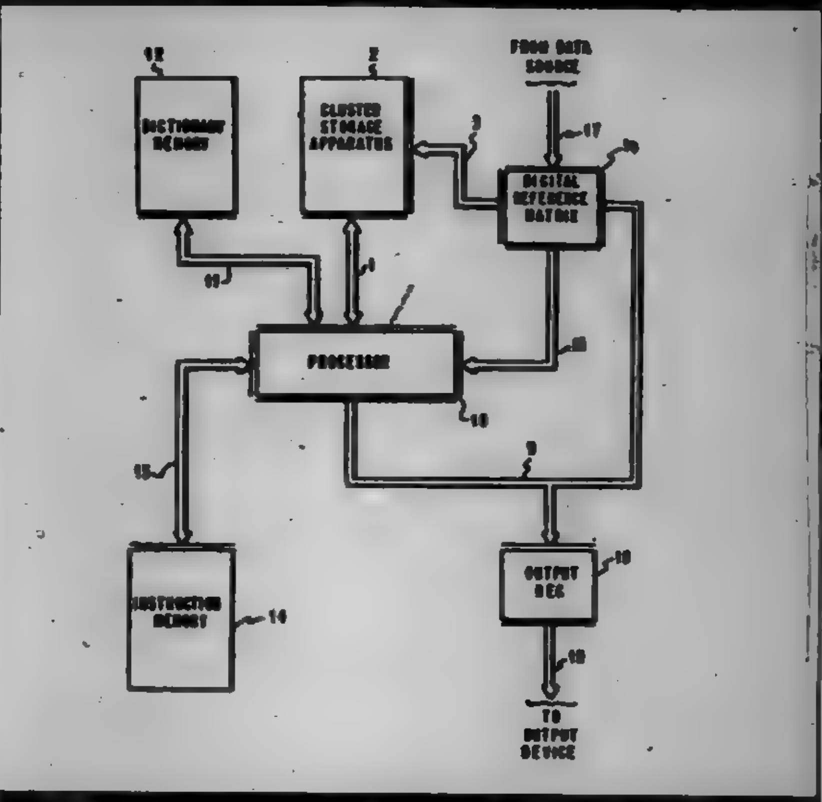

Figure 4

Opportunities and Advice

The new software patents offer unparalleled opportunities for patenting program innovations and licensing patented software program inventions for long-term capital gains. Among those who can benefit are independent programmers and contractors, personal computer enthusiasts, computer hobbyists or anyone else who creates software, whether self-employed or employed by corporations. Some advice on the patenting and licensing process follows.

First, remember that only features of programs — not entire programs — are patented. When developing a program, identify its important features. Next, consider whether these features are new and whether they achieve particular advantages. New and advantageous features are candidates for patenting.

A program feature must be new both with respect to existing U.S. patents and with respect to the tech-

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nical literature within and outside the U.S. While the body of U.S. patents for software inventions is still small, there is a good deal of technical literature on the subject of software.

The exact criteria for determining newness are specified by the U.S. Patent Code.

In order to be patentable, a program feature must not only be new, but also "nonobvious." While it is difficult to define that quality, strong indications of it are provided by "significant advantages."

It is important to keep records. Most inventions have a conception date and a date of reduction to practice. The former is the point of time at which the invention was conceived as an idea. The latter marks the point at which the idea accomplishes its intended purpose in practice. Many inventions are patented after their reduction to practice.

Maintain good records of the conception date and of the activities related to reducing the invention to practice. These records must be properly witnessed. A good reference on this subject is *How to Protect and Benefit From Your Ideas*, available from the American Patent Law Association, 2001 Jefferson Davis Highway, Arlington, Va. 22002.

Proper Licensing

An inventor or owner of a patent may license another party (licensee) to make, use and sell a patented invention in return for licensing or royalty fees.

Patent royalties may be treated as long-term capital gains to the inventor or patent owner, provided that all substantial rights to the patent are transferred to the licensee. Capital gains are advantageous because they are subject to less tax than ordinary earned income.

In order to transfer all substantial rights to your patent, you must observe the following general rules (as explained in *How to Protect and Benefit From Your Ideas*):

1. All claims of the patent must be licensed.
2. The license must be exclusive. In other words, there must be only one licensee.
3. You must not keep a geographic territory for yourself.
4. You must not limit the exclusive licensee to a particular use under your patent.
5. The license must not expire before the expiration date of the patent itself.

About the Authors

Delbert L. Keenon, author of several articles and patents on computer control systems, founded Automation, Inc. in Houston in 1971 to market computer control technology.

He also conducts microcomputer training workshops.

Norman R. Carlson, Techstar Publications, Inc., is the holder or co-holder of 15 U.S. patents, many of which cover computer control and simulation applications. He is the author of a book related to interpreting logs of measured data from producing oil and gas wells, and he designs programs for computerized well-site analyses of these logs.

Keenon and Carlson conduct a seminar on the fundamentals of patenting software.

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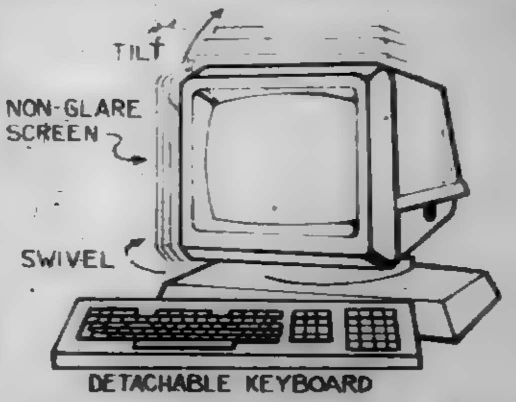

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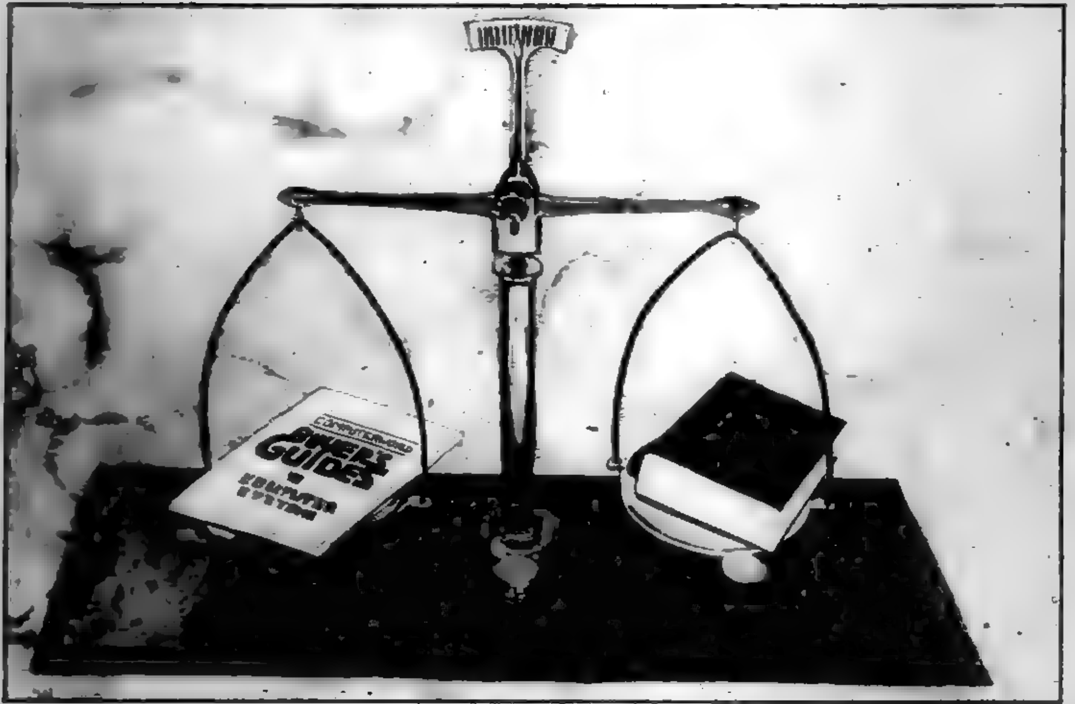

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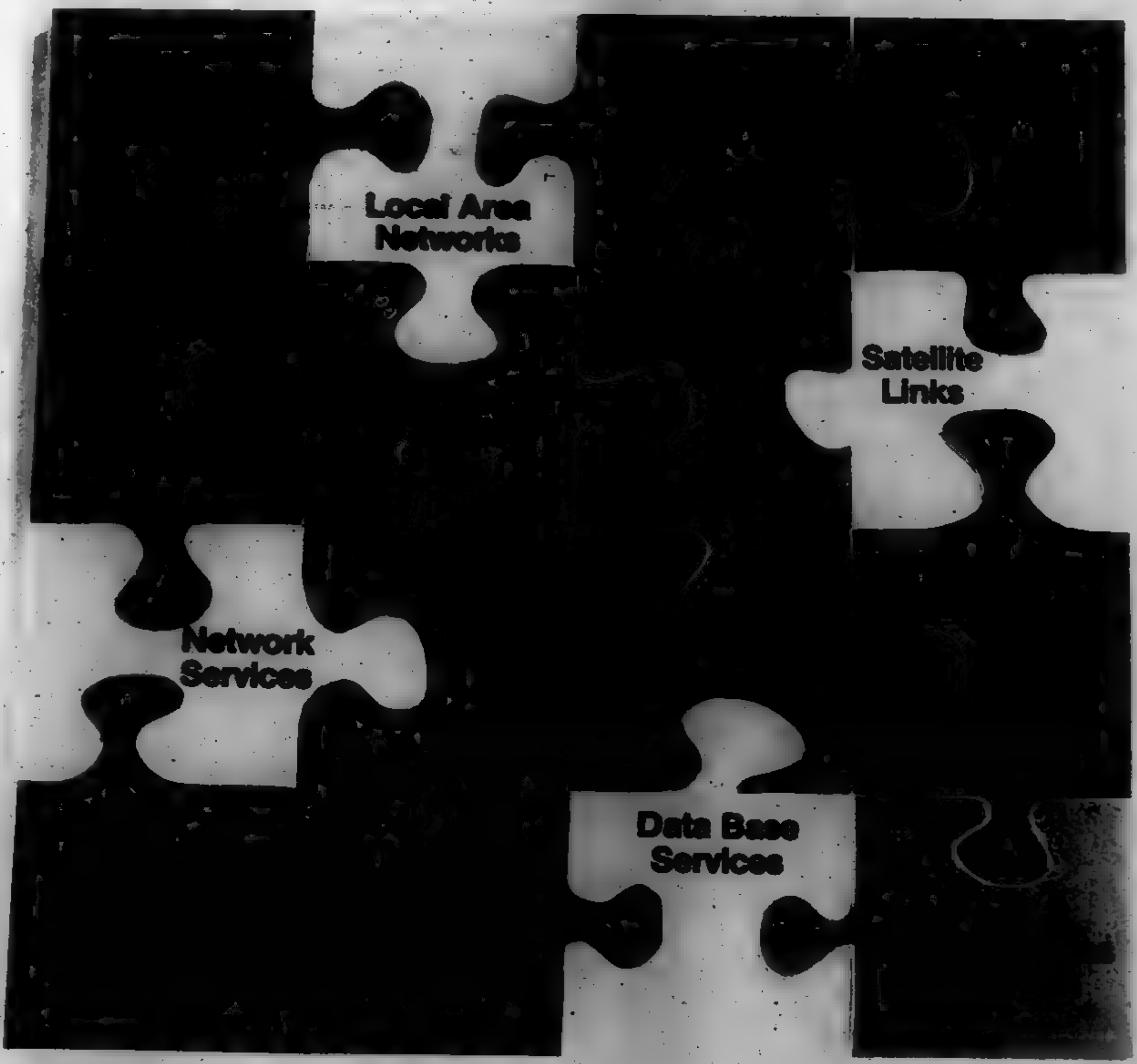

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Table of Contents

Program Committee 4
Industry Editors Advisory Board 5
The Conference.. 6-11
The Banquet . . .12
INTERFACE Exhibitor List..12-13
Miami Beach Map 14
Attendee Registration Form . . .15

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Conference Schedule & Exhibit Hours

Monday, March 21, 1983
Exhibit Hours: 10:00 AM-5:00 PM

9:15-10:45	**Keynote:**	LINKS TO THE FUTURE
11:00-12:00	**HC-1**	Communications Processors and Statistical Multiplexers
11:00-12:30	**SM-1**	Information Management: Environmental Analysis
11:00-12:30	**SS-1**	The OSI Model: New Developments
11:00-12:30	**OI-1**	Video Conferencing: How and When to Use It
11:00-12:30	**EN-1**	Ubiquitous Relay Stations: Satellites Serving Today
11:00-12:30	**HS-1**	Voice Recognition & Synthesis
11:00- 1:00	**DC-1**	DataComm Concepts and Components
3:00- 5:30	**IP-1**	INTERFACE PAPERS
3:30- 4:30	**HC-2**	Modems: A Cost/Performance Spectrum
3:30- 5:00	**IN-1**	International Telecomm Regulations.
3:30- 5:00	**SM-2**	Information Management: Strategy Development
3:30- 5:00	**SS-2**	IP/TCP Protocols: Implications and Prospects
3:30- 5:00	**OI-2**	Voice Mail: Digitized Store and Forward Voice
3:30- 5:00	**EN-2**	Terrestrial Microwave: DTS/DEMS. and Beyond

Tuesday, March 22, 1983
Exhibit Hours: 10:00 AM-5:00 PM

8:00- 9:00	**ND-1**	Early Java I: AT&T Divestiture
9:15-10:45	**ND-2**	Divestiture and Deregulations: Impact on Users
11:00-12:00	**HC-3**	Intelligent Terminals and Desktops
11:00-12:30	**ND-3**	AIS/American Bell: Early Directions
11:00-12:30	**SM-3**	Information Management: Planning
11:00-12:30	**DP-1**	Data Base Distribution: Trade-Off Considerations
11:00-12:30	**OI-3**	Computer Network (Electronic) Mail
11:00-12:30	**ON-1**	Towards 100% Uptime
11:00- 1:00	**DC-2**	The Softside of DataComm
3:00- 5:30	**IP-2**	INTERFACE PAPERS
3:30- 4:30	**HC-4**	Hard Copy Communicators
3:30- 5:00	**SM-4**	Information Management: Implementing the Plan
3:30- 5:00	**LA-1**	LAN: Tutorial Overview
3:30- 5:00	**DP-2**	DDP Users: Case Studies in Action
3:30- 5:00	**OI-4**	From WP to the Integrated Office: Making the Transition
3:30- 5:00	**HS-2**	Satellites for 1990

Wednesday, March 23, 1983
Exhibit Hours: 10:00 AM-5:00 PM

8:00- 9:00	**SM-5**	Early Java II: Information Management Roundtable
9:15-10:45	**OI-5**	Perspectives on Office Integration
11:00-12:00	**HC-5**	Computer-Controlled PBX: The Local Voice/Data Switch
11:00-12:30	**DP-3**	Desktop Computers: New Tier for DDP
11:00-12:30	**LA-2**	LAN Issues: Comparative Analysis
11:00-12:30	**SS-3**	SNA Enhancements: The Annual Update
11:00-12:30	**ON-2**	Performance Enhancement with Hardware/Software Monitors
11:00-12:30	**DB-1**	The Desktop Data Base: Packages and Trends
11:00- 1:00	**DC-3**	Transmission Techniques and Services
2:30- 5:30	**ND-4**	Public Intelligent Networks: Service Trends for Users
3:00- 5:30	**IP-3**	INTERFACE PAPERS
3:30- 4:30	**HC-6**	Fiber Optics: Current Offerings
3:30- 5:00	**IN-2**	New International Services
3:30- 5:00	**LA-3**	LAN Users: Case Studies in Action
3:30- 5:00	**SS-4**	Micro-to-Mainframe: Compatibility Issues
3:30- 5:00	**ON-3**	New Models for Network Optimization

Thursday, March 24, 1983
Exhibit Hours: 10:00 AM-3:00 PM

8:30- 9:30	**HC-7**	New Products for Tech Control
8:30-10:00	**LA-4**	LAN Cabling: Building and Neighborhoods
8:30-10:00	**SS-5**	Off-the-Shelf Packages for Desktops
8:30-10:00	**EN-3**	ISDN Update
8:30-10:00	**DB-2**	Public Data Base Services for Business Applications
8:30-10:00	**HS-3**	Optical Fibers and Laser Beams
8:30-10:30	**DC-4**	Network Architectures
10:45-11:45	**Locknote:**	THE TECHNOLOGY VECTOR
12:00- 1:30	**LA-5**	LAN Interconnects: The Big World Beyond
12:00- 1:30	**EN-4**	Cable TV Projections
12:00- 1:30	**DB-3**	Data Base Packages for Net Control and Management
12:00- 1:30	**HS-4**	Desktops Down the Road
12:00- 1:30	**ON-4**	SNA Net Performance: Special Considerations
1:00- 2:00	**IP-4**	INTERFACE PAPERS

INTERFACE '83 Has Solutions For You.

Data Communications/Information Processing can be puzzling. But INTERFACE '83 has the solution. Practical solutions. At INTERFACE '83 you can explore and investigate all the pieces that make up the Data Communications/Information Processing puzzle. Find out about local area networking... front ends, modems and MUXs... desktop computers... office systems integration... DDP... and much more.

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The INTERFACE Conference is an invaluable tool. Here, as in the past, the nation's leading experts in their fields will be presenting 57 separate sessions dealing with the problems facing the industry today and with such timely matters as the impact of the AT&T divestiture, local area networking and office systems integration. These are insights you need to help put all the pieces of the puzzle together.

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With the help of INTERFACE '83 your travel plans are solved. Because we have made special arrangements with The Eastern Airlines Convention Service Department. Even if they do not service your location, Eastern will make all the reservations to make sure you arrive in Miami Beach in time for the Conference and Exposition. Here's all you do:

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INTERFACE '83 gratefully acknowledges the numerous contributions of this year's Industry Editors Advisory Board and Program Committee. Once again, these men and women have been of immeasurable assistance in the planning and preparation of another dynamic Conference.

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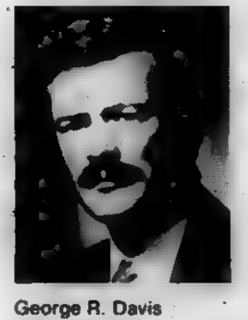

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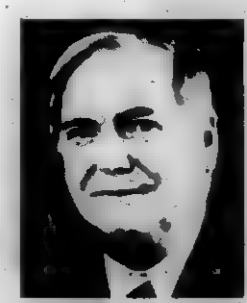

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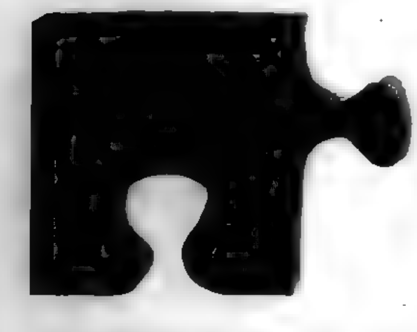


The INTERFACE '83 Conference will help you put the entire Data Communications/Information Processing picture together. In a field where new generations of technologies, services and applications break through each year, our 57 Conference sessions will help you make sense of it all!

Stimulating topics deal with critical issues facing the industry today and talk about what's ahead in the future. Listen and learn from the industry's leading experts as they present the hottest subjects in their respective fields.

Benefit from the Conference's clear and practical advice. Avoid piece-part solutions. Come to the INTERFACE '83 Conference and focus on the total picture.

KEYNOTE:
Links to the Future

Communications links have a synergistic effect on computational power. For 11 years now, that has been an underlying premise of the annual INTERFACE Conference and Exposition. This year, with the judicial unleashing of AT&T and IBM, communications links indeed become the principal links to a future now coming into view. Burdened with daily headlines emphasizing recession/depression and unemployment, we tend to miss the other side of the coin: America is going through a profound (and painful) transformation. What lies on the other side will be different, and better.

New Directions

It's been more than a year now since the historic decisions involving AT&T and IBM. Virtually all sessions in this year's INTERFACE Conference will reflect, to greater or lesser degree, the impact of these events. But this group of sessions has been specifically designed to provide attendees with background facts and forecasts stemming from the reconfiguration of the industry's two leading companies.

ND-1 Early Java I: AT&T Divestiture
Tuesday, March 22, 8:00-9:00

This session will provide an authoritative briefing on the historical record of the AT&T divestiture agreement. The communications landscape changed forever on January 8, 1982, when the US Government dropped its anti-trust prosecution in return for certain concessions from Ma Bell. Distinguished consultant Ralph Berglund will analyze the record of this extraordinary case, thus providing indispensable background not only for other sessions in this key group, but also for this year's entire INTERFACE conference. Coffee and danish will be served.

Chair: Ralph G. Berglund
Industry Consultant

ND-2 Divestiture and Deregulation: Impact on Users
Tuesday, March 22, 9:15-10:45

This "big picture" plenary session will focus on the impact deregulation will have on all users. Will communications cost more or less in this new competitive environment? *Will* there be more competiton? Who will regulate which carriers? The issues for interexchange carriers, state utility commissions and AT&T that concern users will be discussed.

Chair: Richard L. Deal
President
Richard L. Deal & Assoc.

ND-3 AIS/American Bell: Early Directions
Tuesday, March 22, 11:00-12:30

American Bell executives will speak in this session, providing an authoritative company perspective on current and future offerings. Emphasis will be on AIS/Net 1000, both the present Release I and Release II, due later this year. American Bell has very ambitious plans, which now must face the challenge of a competitive marketplace.

Chair: Frank Vigilante
VP — Large/Intermediate Systems
AIS Division
American Bell

ND-4 Public Intelligent Networks: Service Trends for Users
Wednesday, March 23, 2:30-5:30

Entering from quite different points on the spectrum, both IBM and American Bell have dramatically altered the marketplace for public intelligent network services. They join GTE Telenet, Tymnet and others in offering users a rich menu of new options. Radical growth in public network utilization lies ahead, with users in the catbird seat. This panel brings together representatives of major carriers in this expanding arena.

Chair: Walter Levy
President
Edgewood Computer Associates

DataComm School

Since 1973, The INTERFACE Conference has been known for its DataComm School. Over the last 10 years, thousands of attendees have passed through its portals, receiving in four short days a remarkably comprehensive introduction to the arcane discipline of data communications.

DC-1 DataComm Concepts and Components
Monday, March 21, 11:00-1:00

The first DataComm School session offers an indispensable overview (or walk-through) of a total data communications system, from the vantage point of the user looking out. Each principal element will be discussed, including front-end processors, modems, multiplexers, terminals, transmission services and protocols. Concise explanations will be offered for such key concepts as digital/analog, parity bits, half/full duplex, synch/asynch, ASCII and switched circuits/private lines. While this session won't make you an expert, it will enable you to talk with one.

Chair: Gilbert Held
Director
4-Degree Consulting

DC-2 The Softside of DataComm
Tuesday, March 22, 11:00-1:00

Hardware is inert; software makes it happen. This introduction to data communications software will examine programming strategies for data link controls and protocols, synchronization, error control, addressing and polling. Higher level protocols such as SDLC and X.25 will be discussed. This session will provide a good introduction to more advanced software topics elsewhere in this year's INTERFACE Conference.

Chair: David L. Passmore
Staff Consultant
Network Strategies Inc.

DC-3 Transmission Techniques and Services
Wednesday, March 23, 11:00-1:00

Our DataComm School introduction to transmission techniques and services will examine the public dial-up network, along with complementary private line and satellite services. Both 2-point and multi-point configurations will be discussed, as well as the potential for improving line utilization through a variety of multiplexing techniques. The session concludes with a look at Bell's Dataphone Digital Service (DDS) and similar services from other carriers.

Chair: John Nuwer
Mgr., Planning & Evaluation
Electronics & Telecomm.
Atlantic Richfield Co.

DC-4 Network Architectures
Thursday, March 24, 8:30-10:30

Though it often seems that there are as many networking concepts as there are networks, the reality is actually less confusing. Topics in this concluding session of DataComm School will include basic network configurations and standards for network, achieving network transparency, intelligent data network services and, of course, a brief introduction to the dominant network strategy--IBM's Systems Network Architecture (SNA). More specialized and advanced sessions on networking are scheduled throughout the INTERFACE Conference.

Chair: Dr. Philip H. Enslow, Jr.
Prof., Sch. of Info. & Computer Sci.
Georgia Institute of Tech.

Strategies For Information Management

Information management is becoming a strategic function, as opposed to what has been until now merely an administrative task. The range of alternatives for information management has broadened enormously, requiring a variety of new, complex and interrelated decisions. Considered collectively, these decisions define an organization's information management strategy. This key group of sessions will deal with the strategy, development and implementation of information management.

SM-1 Information Management: Environmental Analysis
Monday, March 21, 11:00-12:30

The environment of information management has become chaotic. Rapidly emerging new technologies, proliferation of vendors, deregulation and further pressures from users to "do their own thing" all compound the challenges. The information management executive must identify technical and regulatory trends that pose the greatest opportunities and risks. This session will address those trends and risks, and the associated management issues.

Chair: Christopher Meyer
Senior Associate
Temple, Barker & Sloane

SM-2 Information Management: Strategy Development
Monday, March 21, 3:30-5:00

What is the best way to meet the organization's needs within a volatile environment? One effective technique is to adapt traditional strategic planning to the information management function through a process that helps ensure that information management strategy will be integrated with business strategy, and not vendor or product driven. This session will present both the rationale and the elements of a strategic planning process for information management.

Chair: Bernard Matheisel
Principal of Info. Mgmt. Systems
Temple, Barker & Sloane

SM-3 Information Management: Planning
Tuesday, March 22, 11:00-12:30

As users and senior management become more sophisticated and more demanding, the need for their involvement in technical decision-making is increased. This strategic planning methodology utilizes a conference approach that ensures full participation and commitment on the part of those who must implement the resulting plan, and offers a structured process for the on-going identification and management of issues and rationalization of competing requirements.

Chair: R. Anne Payne
Associate
Temple, Barker & Sloane

SM-4 Information Management: Implementing the Plan
Tuesday, March 22, 3:30-5:00

Implementation of even the best plan entails substantial technical and organizational risks. These risks can be minimized through an implementation approach which recognizes the capabilities and limitations of the information services organization and the culture of the entire organization. Senior managers and implementors are advised to arrive early at this session, and stay late.

Chair: Steve Levine
Sr. Associate
Info. Mgmt. Sys. Group
Temple, Barker & Sloane

SM-5 Early Java II: Information Management Roundtable
Wednesday, March 23, 8:00-9:00

Planning methodology, however elegantly constructed, must meet a pragmatic test of usefulness for the operating manager. Information management executives, each with recent special experience, will share major dilemmas and decisions, as they respond to tough questions from INTERFACE attendees: coffee and danish will be served.

Chair: John Jacobs
General Manager
Info. Mgmt. Sys. Group
Temple, Barker & Sloane

Peter Schemenil
VP-MIS
CBS Inc.

Pat Morrison
Vice President
Information Services
American President Lines, Ltd

Marshall Cheney
VP-MIS
Santa Fe International

International Networks

Worldwide recession has squeezed not only the flow of goods, but also the flow of data. Troubled countries seeking an edge threaten to squeeze trans-border data flow still further. Thus the special significance this year of our group on international networking. The lead-off session will update current policy and regulatory trends affecting international users. The concluding session will review new international telecommunications services. Binary logic can still replace Esperanto, but only if users deepen their understanding of the difficult situation as it now exists.

IN-1 International Telecomm Regulations
Monday, March 21, 3:30-5:00

Inevitably, as a worldwide economic crisis takes its toll, protectionist sentiment rises, not only in matters of trade but also in the trans-national transfer of valuable data. That's what makes this year's update on the international regulatory picture so timely. It is instructive to be reminded that change is not always beneficial; change does not always equal progress. This session will remind international users of this basic fact, and at the same time, equip those users to cope with an increasingly hostile environment.

Chair: Leonard Elfenbein
Chairman/President
Telecom Systems Group

IN-2 New International Services
Wednesday, March 23, 3:30-5:00

Even as roadblocks proliferate on the international scene, new services continue to be offered both by private international carriers and by the PTT (Postal-Telephone-Telegraph) authorities in the various developed countries. If your international links need some polishing, this session provides a good place to start.

Chair: Clark Olsen
Vice President
Telecom Systems Group

Distributed Data Processing

Giving new impetus in the 80's are desktop computers and local area nets. When and how do you "distribute" not only number-crunching power but also portions of the data base itself? The distribution of a corporate or governmental data base raises, as always, a host of security/contention/access questions. DDP users have thoughtfully volunteered their collective experiences, and the group concludes with a DDP-oriented analysis of the desktop computer phenomenon.

DP-1 Data Base Distribution: Trade-Off Considerations
Tuesday, March 22, 11:00-12:30

When you decide to distribute data, you also decide how much of your central data base will be retained. Centralized control remains vital--so that the data, independent of where it resides, is current. Recovery of data has also been a classic DBMS concern, and recovery mechanism concepts are magnified in complexity once the base has been distributed throughout a network. Attend this session, and you'll have a better understanding of these and other ramifications, and the update and recovery safeguards you must build into the process.

Co-Chair: Dr. Dixon Doll
President
The DMW Group, Inc.

Co-Chair: John King
Vice President
The DMW Group, Inc.

DP-2 DDP Users: Case Studies in Action
Tuesday, March 22, 3:30-5:00

The most valuable lessons are never learned in a classroom, but rather in real life. However, those pioneers who have learned some valid lessons about distributed data processing will attempt to transmit their hard-won knowledge in the classroom environment provided by INTERFACE. A buzzword in the 1970s, DDP is an increasingly prevalent reality in the 1980s. Not a panacea, but rather a technological inevitability, DDP offers a new generation of users one possible avenue for growth and progress.

Chair: Frank Dzubeck
President
Communications Network
Architects, Inc.

DP-3 Desktop Computers: New Tier for DDP
Wednesday, March 23, 11:00-12:30

It was challenge enough to integrate regional office minicomputer systems into a hierarchical DDP network ultimately based on the huge mainframe configuration at headquarters. Now comes an even more awesome challenge, as microcomputer desktops proliferate through all levels of the organization. The various compatability and interfacing issues are innumerable. Start to minimize the inevitable confusion, as INTERFACE experts cut through the underbrush of what may well be the toughest operational subject of the decade!

Chair: Dale Kutnick
Director of Research
The Yankee Group

Systems & Software

Ironically, the profound developments in hardware have only served to increase the importance of the soft side of the networks. INTERFACE '83 experts offer their perspectives on these soft-side issues, beginning with an update on Open Systems Interconnect from the International Standards Organization. A follow-up session will cover the continuing transformation of Defense Department protocols to the private sector. Another session deals with recent enhancements to SNA networks.

SS-1 The OSI Model: New Developments
Monday, March 21, 11:00-12:30

Those working on Open Systems Interconnection (OSI) continue their valiant struggle for standards, both international and domestic. As one INTERFACE expert commented, "The reality is that nothing plugs into anything." Such a reality, however exaggerated, provides plenty of work for consultants... and headaches for users. New developments covered in this OSI update will include upper layer architecture, OSI management, security issues within the projected OSI environment, data transmission standards, and more.

Chair: John Day
Product Planner
Cullinane

SS-2 IP/TCP Protocols: Implications and Prospects
Monday, March 21, 3:30-5:00

IP/TCP is a Defense Department-sponsored protocol suite for inter-network computer communications. Currently being installed in ARPANET, this protocol suite is also being used to establish "The Internet." The Internet Protocol (IP) provides a datagram-type service among and across various nets, using whatever lower level windows are available, eg: Ethernet and X.25. The Transmission Control Protocol (TCP) uses IP capabilities to provide end-to-end virtual circuit services between host computers and across networks. This is another state-of-the-art session that will define IP/TCP, who is presently using it, who is supporting it, and what the implications may be for civilian users.

Chair: Einar Stefferud
President
Network Mgmt. Assoc., Inc.

SS-3 SNA Enhancements: The Annual Update
Wednesday, March 23, 11:00-12:30

INTERFACE's annual update on the world of SNA this year includes the integration of new products and service capabilities, including desktop computers and associated local area nets. Recent developments in SNA net management and control will be discussed, along with protocol enhancement to support satellite-based communications. Improvements in cross-domain communications will be analyzed. This important session for so many users will conclude with a look at SNA's potential for integrating voice with data communications.

Chair: Richard L. Deal
President
Richard L. Deal & Assoc.

SS-4 Micro-to-Mainframe: Compatability Issues
Wednesday, March 23, 3:30-5:00

Desktop (microcomputer) issues continue their relentless march through virtually all phases of this year's INTERFACE Conference and, indeed, the traditional mainframe environment within which INTERFACE attendees have always operated. On one level, the linking of micro to mainframe requires that the former appear to be (emulate) a compatible terminal. On another level, the integration of micros into a traditional mainframe environment opens up the possibility of substantial economies--if the small machines have been purchased according to plan, rather than whim. Plan to attend this vital session!

Chair: John King
Vice President
DMW Group

SS-5 Off-the-Shelf Packages for Desktops
Thursday, March 24, 8:30-10:00

As desktop computers decline in price, their value increases. How do you take advantage of this low-cost power? This session will first survey some of the more interesting software packages available over-the-counter for business applications--word processing, spread sheet forecasting, project control and more. There are also an increasing number of packages enabling desktop network interconnection. The session will examine whether it is operationally desirable to use desktops in this way, focusing on presently available off-the-shelf packages.

Chair: Charles C. Joyce, Jr.
President
Network Strategies Inc.

High Speed Futures

How practical are the emerging technologies, and what are their capabilities? The first session in this group answers those questions for voice synthesis and voice recognition technologies. Do we have a place to look for more bandwidth? The next two sessions will examine the future of satellite transmission, lasers and fiber optics, focusing on user needs to process and move more information at lower cost. Finally, this far-sighted group looks into the future of desktops.

HS-1 Voice Recognition and Synthesis
March 21, 11:00-12:30

Computer voice recognition is in its infancy today, but when will it become practical for "electronic stenographer" applications? When will we see systems capability for stored, digitized voice output text and memos in oral form? This session spotlights today's practical realities of voice digitization, while avoiding arcane theory. Speech recognition trends will also be discussed.

Chair: Michael Rothberg
Management Consultant

HS-2 Satellites for 1990
Tuesday, March 22, 3:30-5:00

Users always need more bandwidth, not only to carry increasing volumes of data traffic, but also (and increasingly) voice and video signals. For long haul relays, new satellite technologies may provide some cost-effective answers. Attend this session for late-breaking developments on "antenna farms" in geosynchronous orbit.

Chair: John E. Nuwer
Mgr., Planning & Evaluation
Electronics & Telecomm.
Atlantic Richfield Co.

HS-3 Optical Fibers and Laser Beams
Thursday, March 24, 8:30-10:00

Optical fiber and laser technologies are poised on the threshold of delivering very high bandwidth cabling. Transfer rates in the "gigabit" (billions) range are not only conceivable, but also increasingly attainable. Designers and implementors of local area nets especially can benefit from the information in this session.

Chair: John Morrocco
Dir. of Sales & Marketing
Phalo Optical Systems Div.

HS-4 Desktops Down the Road
Thursday, March 24, 12:00-1:30

Remember when a 4-function calculator (without memory) listed for $485? Today, 8-function calculators are packaged with a wrist watch for $18. Digital wrist watches followed a similar price/performance curve. Yet there are good reasons to suspect that desktop computer systems, while continuing a steady decline in price (for equivalent performance), are moving along a quite different curve. The next generation of 32-bit machines has already been announced, even as the marketplace struggles to accommodate the growing requirements of newly-minted 16-bit users. And industry insiders believe that chip designers are close to achieving mainframe capabilities in a single slice of silicon. The trends are mixed in this key product category. INTERFACE experts will do a fast sort.

Chair: Brian Toren
Staff Engineer
Sperry-Univac

Data Base Developments

Suppliers are offering users convenient data base packages and innovative data base services. These packages and services can be time-savers and cost-savers--*if* you know what you're buying. The first session covers data base packages available off-the-shelf for desktop use by managers and other executives.

DB-1 The Desktop Data Base: Packages and Trends
Wednesday, March 23, 11:00-12:30

Increasingly, desktop computers are connected to hosted data base networks. As these desktop machines become more powerful (and less expensive), it becomes increasingly feasible for them to extract and hold a local subset of the mainframe's data base. Now, and inevitably, data base management software is being implemented on the desktops. Some of these packages are implemented in the "C" language; some are relational data base packages of surprising sophistication. Stay abreast of key packages and trends in this important session.

Chair: Dr. James H. Scheren-Guivel
Supervisor-Spec. Projects
Senate Computer Center

DB-2 Public Data Base Services for Business Applications
Thursday, March 24, 8:30-10:00

As information becomes almost like a commodity, the number of specialized data base information services multiplies. Business users of small desktop machines can now access an extraordinary variety of data base services for information ranging from the latest stock quotes to late-breaking news developments. Organizations as diverse as Dow-Jones, the New York Times and the Library of Congress have organized huge masses of information which now can be conveniently retrieved by simple menu selection. Information is power, and these public data base services offer the potential to magnify yours! Tune in at this session for further details.

Chair: Stewart S. Morick
President
Stewart Morick & Assoc.

DB-3 Data Base Packages for Net Control and Management
Thursday, March 24, 12:00-1:30

Integration of net control and management software into the total data management system is a process seemingly without end, in both sidestream and mainstream environments. Latest developments in this important area will be discussed by technical experts from three leading vendors. The handling of network traffic can be significantly improved through response measurement and monitoring incorporated in the data base itself.

Chair: Richard B. Freeman
Senior Engineer
Communications Prod. Div.
IBM

Emerging Network Technologies

New schemes for transmission abound. For users, it all adds up to more and better services. INTERFACE '83 speakers in this important group of sessions will analyze network technology developments from the perspective of large-scale users. The group begins with an examination of satellite transmission as it exists now. The group concludes with a look at the application potential of cable TV facilities. In between, there are some developments in terrestrial microwave which merit your careful attention.

EN-1 Ubiquitous Relay Stations: Satellites Serving Today
Monday, March 21, 11:00-12:30

This session will evaluate satellite-based telecommunications services, currently available and proposed for the near future. INTERFACE experts will also update attendees on related earth-bound ambitions of specialized common carriers. Perhaps space isn't the final frontier, in the continuing drive to bring new and innovative services to large-scale users.

Chair: To be announced

EN-2 Terrestrial Microwave: DTS/DEMS and Beyond
Monday, March 21, 3:30-5:00

Terrestrial microwave is still fundamental in most network implementations. You'll be briefed on trade-offs between common and private carriers, between wide and narrow band transmissions, between various systems options and frequencies. Private microwave services will also be examined—to see what they can replace, how they adapt, what are their layout criteria, and when they make good economic sense. This session concludes with an examination of Digital Termination Service (DTS) and Digital Electronic Message Service (DEMS).

Chair: Edward F. Tuck
President
Edward Tuck & Co., Inc.

EN-3 ISDN Update
Thursday, March 24, 8:30-10:00

The millenium has not yet arrived, nor has the long-heralded Integrated Services Digital Network (ISDN), combining the transmission of information from a variety of sources--data, digitized voice and TV, documents, etc. Yet progress is being made, principally under the auspices of the CCITT, and various governmental and private organizations around the world have put forward substantial commitments in the form of both dollars and the requisite technologies. You'll want a seat in this session for an ISDN briefing that will emphasize implications for U.S. users.

Chair: Philip Black
President
Takatec Inc.

EN-4 Cable TV Projections
Thursday, March 24, 12:00-1:30

Cable TV (CATV) is proposed as one technique for intra-city interconnect, thus bypassing altogether the BOC local loops. An entire CATV transmission system now resides in most major cities in parallel with conventional (BOC) facilities. What's missing are protocol/interface standards to exploit CATV for business communications. A whole new network for voice, data, and video services is on the edge of realization. Speakers will assess its feasibility for business use.

Chair: Max Beere
President
Torotel Systems Inc.

Optimizing Network Performance

New network strategies are constantly aiming to enhance or optimize performance. Using hardware and software monitors to maximize uptime is the focus in the first session of this group; designing for "fail safe redundancy" has brought many nets close to what was formerly (and by definition) an unachievable goal. The group continues with a session on performance enhancement through use of software monitors. The third session in the group provides an in-depth look at network optimization. And this group concludes with an important session on how best to "tweak" an SNA network.

ON-1 Towards 100% Uptime
Tuesday, March 22, 11:00-12:30

Hardware and software monitors feed a constant stream of information about the network into their control centers. Unfortunately, and all too often, this information is either ignored or acted upon ineffectively. The focus of this key session will include how to design in, purchase and use these indispensable network aids. If you're among those plagued by network degradation, you'll begin to regain a sense of control here and at a companion session, ON-2.

Chair: Dr. Israel Gilman
President
The DVI Communications Group

ON-2 Performance Enhancement with Hardware/Software Monitors
Wednesday, March 23, 11:00-12:30

Network managers spend a considerable portion of valuable time "tweaking" their systems for optimum performance. Configuration changes and load balancing can improve both response time and throughput. Proper use of information derived from hardware and software monitors is essential for this kind of optimization. This important session is always heavily attended.

Chair: Frank Dzubeck
President
Communications Network Architects, Inc.

ON-3 New Models for Network Optimization
Wednesday, March 23, 3:30-5:00

Optimizing network performance in the design phase makes more sense and is more cost-effective than "tweaking" that same performance after the net is up and running. Network technologists have developed new models for this kind of optimization; these new models will be analyzed here for their inevitable trade-offs and most appropriate applications. INTERFACE expert Dr. Wushow Chou will conduct his typically thorough briefing.

Chair: Dr. Wushow Chou
Prof & Dir. of Computer Studies
N.C. State University

ON-4 SNA Net Performance: Special Considerations
Thursday, March 24, 12:00-1:30

IBM's Systems Network Architecture (SNA) continues to hold a leading share of the large user marketplace. But those same users are always pleased to discover that they do indeed have alternatives, both hardware and software, to an increasing dependence upon the single dominant vendor. Users migrating up from binary synchronous nets can obtain special benefits from "special considerations" discussed at this session.

Chair: Dr. Wushow Chou
Prof. & Dir. of Computer Studies
N.C. State University

Hardware Connections

INTERFACE '83 experts will survey the basic technology trends (and price points) for a variety of carefully chosen product categories. From modems to MUXs, from terminals to processors, from microprocessor-controlled PBXs to the latest developments in fiber optics and tech control, these sessions are well calculated to bring attendees both on-stream and up-to-speed.

HC-1 Communications Processors and Statistical Multiplexers
Monday, March 21, 11:00-12:00

By taking over the housekeeping chores, communications processors and statistical multiplexers greatly facilitate network performance. That's why this important product category is once again the subject of analysis by INTEFACE experts. They will examine not only the current price points, along with their associated features, but also design trends to be kept firmly in mind by prospective purchasers. Be forewarned; this session is often SRO.

Chair: A.A. (Tony) Carlson
Vice President
Torotel Systems, Inc.

HC-2 Modems: A Cost/Performance Spectrum
Monday, March 21, 3:30-4:30

Yes, giant billion dollar programs continue to chip away on the transformation of analog networks into all-digital transmission facilities. In the meantime, the humble yet indispensable modem not only survives, but thrives. That's why, year in and year out, our annual review of modems is heavily attended. There are modems for every conceivable application and pocketbook. Technical experts will analyze new modems of special significance for most INTERFACE users.

Chair: Gilbert Held
Director
4-Degree Consulting

HC-3 Intelligent Terminals and Desktops
Tuesday, March 22, 11:00-12:00

Since many desktops can emulate intelligent terminals, and since intelligent terminals can perform at least some of the traditional applications associated with desktops, this INTERFACE survey of price points and trends combines the two categories. Though both product categories are analyzed within the perspective of a datacomm environment, there are those special jobs for which one is much to be preferred over the other! Our experts will do a fast (manual) sort!

Co-Chair: Pete Moulton
Principal
Moulton & Co.

Co-Chair: Don Pinnell
Manager — Data Communications
Aircraft Engine Group
General Electric Company

HC-4 Hard Copy Communicators
Tuesday, March 22, 3:30-4:30

Net designers now have a host of new options when it comes to scattering hard copy capabilities throughout multiple locations. A regional sales office might choose a low cost dot matrix printer. At the warehouse, a high speed line printer capable of handling label stock might be preferred. The executive work station usually requires letter quality. And so it goes, with a menu of communicating print-out options sufficient for all but the most refined palates. INTERFACE speakers will cover the latest in teleprinters, laser copiers and fax.

Chair: To be announced

HC-5 Computer-Controlled PBX: The Local Voice/Data Switch
Wednesday, March 23, 11:00-12:00

Growing companies usually find that a faster pace of business activity quickly outstrips the limited capabilities of the traditional PBX. Enter the computer-controlled PBX, with its numerous features including optimum call routing, camp-on, abbreviated dialing, etc. In the new wide open and very competitive environment following AT&T divestiture, this is a product category now in considerable flux. The session will survey some major product offerings in this category, both "real" and proposed.

Chair: Dr. Dixon Doll
President
The DMW Group, Inc.

HC-6 Fiber Optics: Current Offerings
Wednesday, March 23, 3:30-4:30

While the price/practicality barrier for fiber optics hasn't yet been (quite) broken, there are unique applications that make considerable sense right now. For example, since a fiber optic link is virtually impossible to tap without detection, applications requiring a high degree of security are now very feasible. The high bandwidth capability of fiber optics is another important feature, particularly for medical and scientific data acquisition. You'll get an objective survey of current offerings and trends sure to impact your own installation at some point in the decade.

Chair: Rick McCaskill
Operations Manager
Phalo/O.S.D.

HC-7 New Products for Tech Control
Thursday, March 24, 8:30-9:30

Complex networks require comprehensive control. Remote diagnostic capability is found in modems, MUXs and terminals at the outermost reaches of the net, while centralized monitoring of these remote inputs becomes ever more sophisticated. The choice is not between remote and centralized control. The choice is in the mix between the two. INTERFACE experts survey recent new products which impact this on-going choice for network managers.

Chair: Rudolf J. Andersen
2nd VP
Chase Manhattan Bank, NA

Local Area Networks

Future historians will remark with irony that information systems on opposite coasts were linked years before such linkage was achieved in the same building or neighborhood. But those who are now implementing Local Area Networks (LANs) are determined to make up for lost time. The group begins with a tutorial on Local Area Networks. It continues with an objective analysis of certain technological issues in LAN implementation - broadband vs. baseband, contention vs. token passing, etc.

LA-1 LAN: Tutorial Overview
Tuesday, March 22, 3:30-5:00

If you, like so many of us, feel as though you have been left behind in the blitz of information about the rapidly growing Local Area Network (LAN) arena, then Dr. Howard Frank will bring you on-line and up-to-speed. You'll learn about broadband versus baseband, token passing versus contention, rings versus stars, and more. Other pressure points including current cabling developments and gateways to public/private nets will also be discussed. The session will also prepare you for four additional, and more specialized, LAN sessions that follow.

Chair: Dr. Howard Frank
President & CEO
ConTel-Info. Systems

LA-2 LAN Issues: Comparative Analysis
Wednesday, March 23, 11:00-12:30

Local area network (LAN) decisions are not as simple as choosing chocolate over strawberry: mere preference without trade-off. Once taken, each basic LAN choice must confer distinct advantages, even though associated trade-offs may well be negative. In today's intensely competitive environment, this key LAN session can be your laboratory for numerous tough decisions--broadband versus baseband, token-passing versus contention, and all the rest.

Chair: Dr. Philip H. Enslow, Jr.
Prof., Sch. of Info. & Computer Sci.
Georgia Institute of Tech.

LA-3 LAN Users: Case Studies in Action
Wednesday, March 23, 3:30-5:00

This session will feature reports from early local network implementors. Their experiences in choosing what to implement, and how, will be invaluable to those about to take the step. Speakers will discuss the entire process--from initial decision-making through reports on how their local nets are functioning now.

Chair: Charles C. Joyce, Jr.
President
Network Strategies Inc.

LA-4 LAN Cabling: Building & Neighborhoods
Thursday, March 24, 8:30-10:00

Cabling can be the most expensive and time-consuming aspect of LAN installation. Cabling must be right for present technology, and suitable for any planned expansion or upgrade. Codes must be met. All this involves choices, ranging from inexpensive twisted pair cable through to broadband coaxial and fiber optics. Which is right for your implementation, your building, your neighborhood? In this session, you'll get some solid answers from INTERFACE experts.

Chair: Edward Newhouse
Account Manager
Transpac Electronics, Inc.

LA-5 LAN Interconnects: The Big World Beyond
Thursday, March 24, 12:00-1:30

How to broaden the scope of your local area network into a wider world of communications and processing facilities is the theme of this important session. When you implement a LAN, you commit to a gateway strategy that can profoundly impact your global information management plan. Get it right the first time, starting here.

Chair: Mort Forigang
Vice President-Operations
ConTel Info. Systems

Office Integration

Data Communications is the single most important technology in achieving an automated office, say the experts. Without data communications, the office cannot be automated. From this communications perspective, INTERFACE experts will discuss office systems integration. To begin with, video conferencing will be examined along with mail, both electronic and voice. Next, how do you effectively and efficiently make the transition from your current word processor to the integrated office? To wrap-up the group, leading theoreticians offer some long range perspectives on the entire phenomenon.

OI-1 Video Conferencing: How and When to Use It
Monday, March 21, 11:00-12:30

As the costs of plane fares and hotel rooms continue their inexorable climb, more corporate and governmental organizations consider the alternative: video conferences. These same organizations quickly discover that video conferencing is also expensive, and often difficult to put together in a network configuration which meets operational requirements. When can a video conference be justified? Should an organization have its own video facilities? Or should it contract out to a vendor for assemblage of an instant, one-time-only ad hoc video network? These and other issues will be analyzed here by INTERFACE experts.

Chair: Randy Goldfield
President
The Omni Group

OI-2 Voice Mail: Digitized Store and Forward Voice
Monday, March 21, 3:30-5:00

Only the phone company, or perhaps a few clever work-dodgers, can relate to "telephone tag." But we all play it, more than 40 percent of the time we place a call, or when someone tries to call us. The proposed answer: "Voice Mail." Present systems digitize messages for storage and forwarding. Future systems may accept dictation for hard copy output and/or "real" stored text read back over a handset. The session offers a survey of the technology, along with available products and services.

Chair: Donald H. Van Doren
President
Vanguard Telecomm., Inc.

OI-3 Computer Network (Electronic) Mail
Tuesday, March 22, 11:00-12:30

One INTERFACE expert likes to note that some "electronic mail" systems involve use of the friendly Postman in the final delivery stage. By contrast, Computer Network Mail can be defined as "inter-computer file-to-file text transfers, from senders to receivers, through third party delivery systems, i.e. networks". Sounds like a mouthful, and it is. This session is very much state-of-the-art, with presentations including use of computer mail relay in the Computer Science Network (CSnet) and a costs/feature survey of commercially available computer network mail services.

Chair: Einar Stefferud
President
Network Mgmt. Assoc., Inc.

OI-4 From WP to the Integrated Office: Making the Transition
Tuesday, March 22, 3:30-5:00

Moving beyond stand-alone word processing into the genuine integration of office systems is a fundamental transition. A single missed step, and it's back to Square One. What's involved is the creation of a flexible infrastructure in support of interconnected (and compatible) systems. Tough issues abound, requiring timely management decisions at all levels. This transition isn't as easy as it looks, but you can make it look easy to those around and above you!

Chair: Amy Wohl
President
Advanced Office Concepts

OI-5 Perspectives on Office Integration
Wednesday, March 23, 9:15-10:45

INTERFACE brings together three leading experts for their varying theoretical perspectives on office systems integration (aka "office automation"). All the pieces of the puzzle are now out on the table ready to be put into place. But which piece should be picked up first? Enormous improvements in white collar productivity are now achievable, but obstacles ranging from merely financial to "people considerations" intrude. Great care must be taken to avoid the downside risk of simply trading in the traditional paperwork kluge for an electronic version of same.

Einar Stefferud
President
Network Mgmt. Assoc., Inc.

Amy Wohl
President
Advanced Office Concepts

Dale Kutnick
Director of Research
The Yankee Group

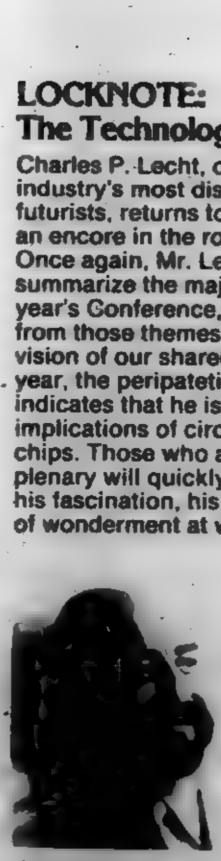
INTERFACE Papers

New this year at INTERFACE '83 is a series of more formal presentations, all of them in competition for the prestigious $3,000 Karp Award (named for Harry Karp, founding editor of *Data Communications* magazine). Special sessions have been reserved for these presentations; for exact topics and scheduling see special notices posted in Registration and Conference areas. These presentations have undergone a limited screening or refereeing process.

IP-1 INTERFACE Papers
IP-2 INTERFACE Papers
IP-3 INTERFACE Papers
IP-4 INTERFACE Papers

LOCKNOTE: The Technology Vector

Charles P. Lecht, one of the industry's most distinguished futurists, returns to INTERFACE for an encore in the role of Locknoter. Once again, Mr. Lecht will summarize the major themes of this year's Conference, then extrapolate from those themes his provocative vision of our shared future. This year, the peripatetic Mr. Lecht indicates that he is fascinated by the implications of circuit density of LSI chips. Those who attend this final plenary will quickly come to share his fascination, his child-like sense of wonderment at what awaits us all.



Charles Lecht
President
Lecht Sciences Inc.

The Banquet

Join us at the Second Annual Industry Awards Banquet for dinner, dancing and industry-wide awards ceremony. Co-sponsored by Data Communications Magazine, this exciting event will be held the second night of the show, Tuesday, March 22.

Highlighting the banquet will be the presentation of The Interface Award for extraordinary achievement in data communications. In addition, The Harry R. Karp Award with its $3,000 prize for best Conference paper and The Shellys for Best Exhibits will be made.

Entertainment, following the awards, will feature internationally-renowned comedian, Norm Crosby, with dancing until midnight. Tickets are $45 per person (black tie optional).

Limited seating will be available at the show. For preferred seating, tickets must be reserved and prepaid by March 7. Please see the attached registration form for complete reservation information.

Sheldon G. Adelson, President of THE INTERFACE GROUP, Inc. (left) presents The Interface Award to Dr. Lawrence Roberts at INTERFACE '82.

INTERFACE

ADC Telecommunications
AEG Telefunken
AIS-American Bell
  Advanced Info. Systems
Altos Computer Systems
AMCO Engineering Co.
American Photonics, Inc.
American Satellite Company
Ameritec Corp.
Anadex, Inc.
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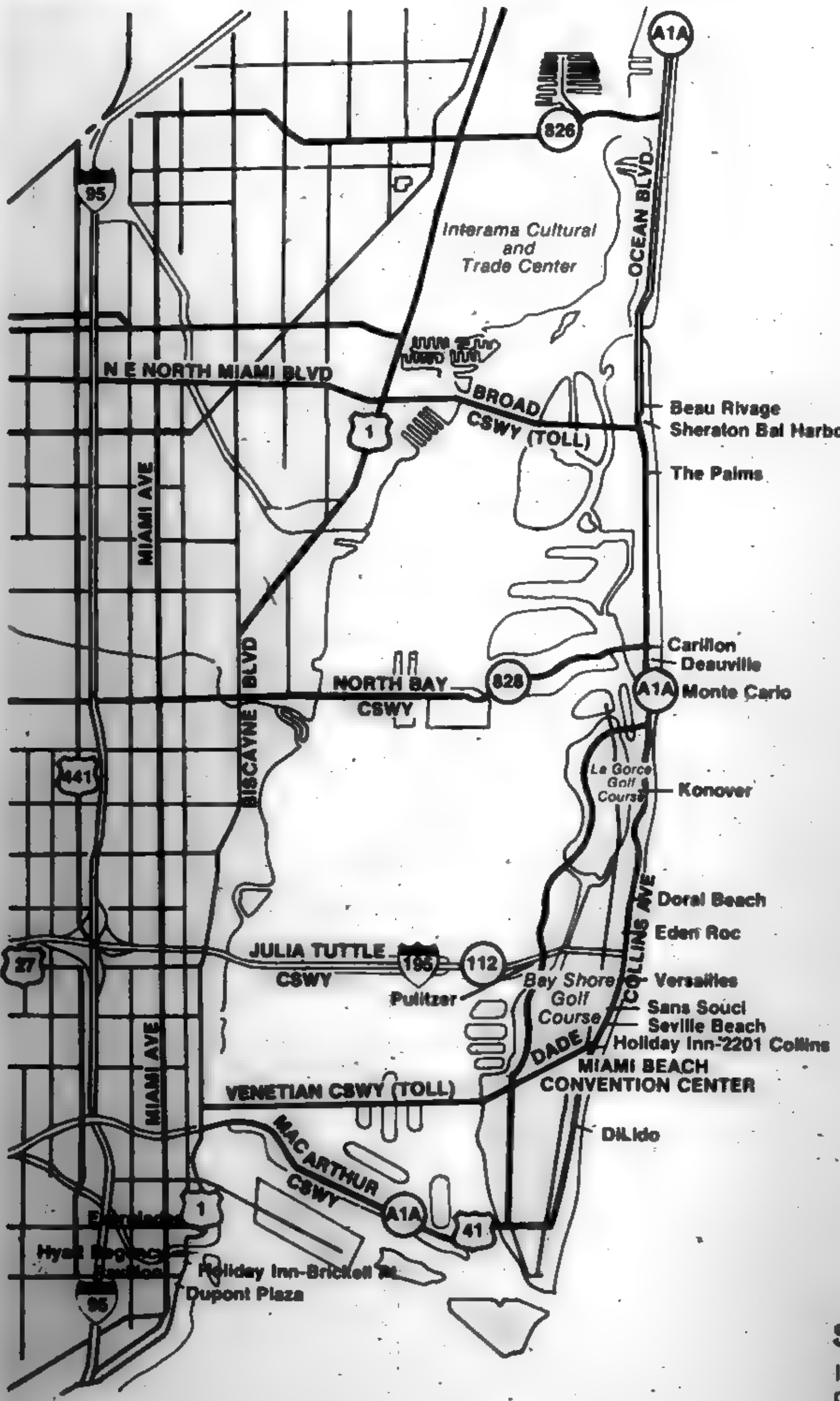
  CW Communications Div.
Computer Communications Inc.
Computer Decisions
  Hayden Publishing
Computer Design Publishing Co.
Computer Devices, Inc.
Computer Products
Computer Transceiver
  Systems Inc.
COMSAT
  World Systems Div.
Concord Data Systems Inc.
The Consultant Group
  Rich Inc. Division
Contel Information Systems Inc.
Convergent Technologies
Data Communications
  McGraw-Hill Publications
Data Decisions, Inc.
Data Processing Management
  Assoc.-DPMA
Data Set Cable Co., Inc.
Data Sources
  Ziff-Davis Publishing Co.
Data-Switch Corp.
Datacom Northwest, Inc.
Datacomm Management
  Sciences, Inc.
Datagram Corp.
Datalink Ready

’83 List of Exhibitors as of January 17, 1983

- Datapro Research Corp.
- Dataproducts New England
- Datastream Communications
- Datatel Inc.
- Datatronix, Inc.
- Datec, Inc.
- Delux Check Printers Inc.
- Develcon Electronics, Inc.
- Digilog, Inc.
- Digital Communications Assoc.
- Digital Controls Corporation
- Digital Equipment Corp.
  - DEC
- Digital Microsystems, Inc.
- Digital Pathways Corporation
- Digital Solutions Inc.
- Digitech Data Industries, Inc.
- The DMW Group, Inc.
- Domain Systems, Inc.
- Draconis Corporation
- Dranetz Engineering Laboratories
- Dynatech Data Systems
- ECS Microsystems, Inc.
- Electrodata Inc.
- Emulex Corporation
- Envax Corporation
- Evans Economics
  - Susan Craft Associates
- Exxon Communications
  - Intecom, Inc.
- Fairchild Publications
  - Electronic News/MIS Week
- Fibronics International, Inc.
- FlQuench Fike Metal
  - Products Corp.
- FOREMARK GMBH
- France Cable And Radio
  - Intelmatique
- G.A. Field Personnel Consultants
- Gandalf Data Inc.
- General Cable Corp.
  - Fiber Optics Div.
- General DataComm
  - Industries, Inc.
- General Electric Co.
  - Microwave Link Operations
- General Power Systems
- Glitronix
- GTE Telenet
- Halcyon Communications Inc.
- Harbor Electronics Inc.
- Hayes Microcomputer
  - Products, Inc.
- Hekimian Labs Inc.
- Hewlett-Packard Co.
- Hitachi America
  - Telecommunications Sales & Serv.
- Hitchcock Publishing Co.
  - Infosystems
- Honeywell Information Systems
- IBM Corp.
  - Information Systems Group
- ICOT Corp.
- Idacom Electronics
- IE Systems
- Infotron Systems Corp.
- Innovative Electronics Inc.
- Intecom, Inc.
  - Exxon Communications Div.
- Interlan Inc.
- International Data Sciences
- International Mobile Machines Corp.
- Intersil, Incorporated
- Intertel Inc.
- ITT World Communications Inc.
- Kinex Corporation
- KMW Systems Corporation
- Lanier Business Products
- Lee Data Corp.
- M/A-COM DCC Inc.
  - Digital Comm. Corp.
- MEMOTEC Division of Systcom Inc.
- Micom Systems, Inc.
- Micro Component Technology
  - NWW Micro Systems
- Microcom Inc.
- Mini Micro Systems/Cahners Pub. Co.
  - Business Computer Systems
- Modcomp
- Mohawk Data Sciences
  - MDS Systems, Qantel
- Multi-Tech Systems, Inc.
- Navtel, Ltd.
- NCR Comten, Inc.
- NEC America
  - Radio And Transmission Div.
- Network Systems Corp.
- North American Philips
- Northern Telecom Inc.
- The Office Magazine
  - Office Publications, Inc.
- On-Line Software International
- Optelecom, Incorporated
- Orionics, Inc.
- Paradyne Corp.
  - Marketing Division
- Peed Publishing Inc.
  - The Processor
- Pennwell Publishing Co.
  - Telecommunications Prod. & Tech.
- Penril Corp.
  - Data Communications Division
- Perle Systems Ltd.
- Phalo
  - OSD Corporation
- Phillips Publishing
- Porta Data Corporation
- Prentice Corporation
- Proteon Associates Inc.
- Protocol Computers
- Qantel MDS Systems
  - Mohawk Data Sciences
- Quality Micro Systems, Inc.
  - QMS
- Questronics, Inc.
- Racal-Milgo, Inc.
- Racal-Vadic
- Rapicom Inc.
- RCA American Communications
- RCA Corp.
  - Solid State
- RCA Cylix Communications Network
- Reactive Systems
- Renex Corporation
- Rixon Inc.
- The Robot Factory
- Rockwell International
  - Electronic Devices Division
- Rolm Telecommunications
  - Business Communications Group
- Scientific Atlanta Inc.
- Scitec Corporation
- Seismograph Service Corporation
  - Subsidiary Of Selecor Inc.
- SESA-Honeywell Communications, Inc.
- Siecor Optical Cable
- Siemens Corporation
- Sierra Data Sciences, Inc.
- Silver-Reed America, Inc.
- The Sizzle Sheet
- Software Results Corp.
- SOLOSystems Inc.
- Starnet Data Systems
- Stratus Computer, Inc.
- Support Systems International
  - Cables & Accessories Div.
- Systems Distribution Group
  - DMR Associates
- Systems Technology Forum, Inc.
- Sytek, Inc.
- T-Bar, Incorporated
- Technical Analysis Corporation
  - TAC
- Technical Publishing Company
  - Datamation Division
- Technology Transfer Institute
- Tekelec, Inc.
- Tektronix, Inc.
  - Marketing Communications Support
- Telautograph Corporation
- Telco Research
- Telecom Systems Group, Inc.
  - The World Telecommunications Div.
- Telecommunications Magazine
  - Horizon House
- Telecommunications Techniques Corp.
  - Dynatech Company
- Telematics International, Inc.
- Teleray
  - Div. of Research Inc.
- Teletex Communications Corp.
- Teletype Corp.
- Tellabs, Inc.
- Teltone Corp.
- Telxon Corporation
- Tesdata Systems Corporation
- Thomas Engineering Company
  - Data Communications Systems
- 3M Business Communication Products
- Tiffany Stand & Furniture Co.
- Time & Space Processing, Inc.
- Timeplex Inc.
- TITN Inc.
- Tri-Data
- Tymnet, Inc.
- Ungermann-Bass, Inc.
- United Telecom Communications, Inc.
  - Uninet Inc.
- Universal Data Systems, Inc.
- Univex International Ltd.
  - Software Packaging
- U.S.P.D.I.
- Valtec Corporation
- Via West, Inc.
- Videodial Inc.
- Visual Technology, Inc.
- Votan, Inc.
- Votrax
  - Federal Screw Works Div.
- W & G Instruments, Inc.
- Western Data-Com
- Western Union International
  - WUI
- XICOM Technologies Corp.
- The Yankee Group Research, Inc.

and more to come!

Miami Beach, Florida



Shuttle Bus Service

INTERFACE show management will provide complimentary shuttle bus service to and from the convention center from most listed hotels.

INTERFACE '83

March 21-24, 1983
Miami Beach Convention Center
Miami Beach, Florida

In order to have your badge waiting for you at the INTERFACE '83 Registration Desk, we must have this form by Monday, March 7, 1983. Fill out and mail to INTERFACE '83, 300 First Avenue, Needham, MA 02194. After March 7 -- you must register on-site. Payment for Awards Banquet reservations must be received by March 7, 1983, to assure preferred seating.

To register by phone call (617) 449-6600.

Attendee Registration Form **EXHIBITORS: PLEASE USE EXHIBITOR STAFF REGISTRATION FORMS.**

Please print or type name as you wish it to appear on your badge. **MINORS CANNOT BE ACCOMMODATED.**

NAME
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COMPANY
COMPANY ADDRESS
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CONFERENCE REGISTRATION FEES

(All full or one day conference fees include admission to the exhibits.)

☐ CF-Full Conference (Includes Conference Proceedings) $225
☐ BA-Full Conference and Awards Banquet $270

☐ CO-One Day Conference $125
☐ BO-One Day Conference and Awards Banquet $170

☐ EO-Exhibits Only .... $ 10
☐ BC-Exhibits Only and Awards Banquet .... $ 55

☐ My registration check is enclosed for $ ______________
(Make Payable to INTERFACE '83 Registration Department.)

☐ Please bill me. My purchase order number is ______________
(To avoid long lines at the show, bill must be paid by March 7.)

Mail this form with your registration fees to: INTERFACE '83, Registration Department, 300 First Avenue, Needham, MA 02194.

CIRCLE ONE IN EACH GROUP

BUSINESS OR INDUSTRY CLASSIFICATION

- TA **Finance:** Banking, Insurance, Securities & Credit
- TB **Service Industries** (except Computer & Datacomm Services)
- TC **Transportation Services:** Land, Sea, Air
- TD **Manufacturing and Processing:** Except Computer & Peripheral Equipment
- TE **Utilities:** Communications (Common & Specialized Carriers) Pipelines and Energy
- TF **Education:** College, University and School Systems
- TG **Health Care.** Hospitals
- TH **Government:** Federal, State, Local including Military
- TJ **Manufacturing:** Computer & Peripheral Equipment
- TK **Computer Services:** Service Bureaus, Software, Time Share and EDP Consultants
- TL **Communication Services:** Broadcast, Newspaper, Newswire, Publishing
- TM **Distribution:** Wholesale & Retail
- TN **Representatives/Dealers:** Computer & Data Communications Products
- TP **Professional Services:** Accounting, Legal etc
- TR **Media**
- TZ **Other** (Please specify) ______________

YOUR FUNCTION

- FP Corporate Management
- FH Operations Management
- FK DP/Data Communications Operations
- FL Telecommunications Operations
- FM Finance
- FN Purchasing
- FO Marketing/Sales
- FG Consulting
- FJ Press
- FF Engineering/Engineering Management
- FZ Other ______________ (Please specify)

USAGE CATEGORY

- UE End User
- UQ End User Buying in OEM Quantities
- UM OEM

SIZE OF ORGANIZATION

- JA Under 100
- JB 100-499
- JC 500-999
- JD 1000-4999
- JE Over 5000

BILLING ADDRESS IF DIFFERENT FROM ABOVE

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ACCOMMODATIONS

To receive special "Conference Rates", our staff must make a reservation for you at those hotels shown below. Please check your first three choices in the boxes alongside the hotels, and specify your arrival and departure times. **Please indicate hotel choice by writing the numbers 1, 2, and 3.**

Choice	HOTEL	☐ Single	☐ Double	☐ Suite
	Beau Rivage	$68-76	$68-76	$161
	Carillon	$76	$80	$190
	Deauville	$57	$57	$110-
	DiLido Hotel	$48	$50	—
	Doral Beach	$105	$105	$215-
	Dupont Plaza	$60	$70	$90-
	Eden Roc	$85	$85	$145-
	Everglades	$55	$55	$80
	Holiday Inn-Brickell Pt	$50	$50	$80
	Holiday Inn-2201 Collins	$52	$52	—
	Hyatt Regency	$75	$85	$150-
	*Konover **SOLD OUT**	$84	$89	$160-
	Monte Carlo	$50	$50	$130-
	The Palms	$70	$82	$125
	Pavilion	$98	$108	$275-
	Pulitzer	$66	$74	$90-
	Sans Souci	$50	$50	$125
	Seville Beach	$50	$50	$115-
	*Sheraton Bal Harbour	$95,100,105	$95,100,105	$200-
	Versailles	$45	$45	$150

* Co-Headquarter Hotels

ACCOMMODATIONS:

Arrival: Date ______________
☐ Guaranteed Late Arrival
Departure: Date ______________
SHARE WITH ______________
COMMENTS ______________

In the event of cancellation, registration fee will be refunded if notice is received prior to February 21, 1983. If received on or after February 21, 1983, fee will be applied toward registration for INTERFACE '84.

INTERFACE '83 HELPS YOU PUT TOGETHER THE DATA COMMUNICATIONS/INFORMATION PROCESSING PICTURE!

The 11th Annual INTERFACE '83 Conference and Exposition is one you won't want to miss. In a field where new generations of technologies, services and applications break through each year — INTERFACE is where you can come to put the pieces together. With over 250 exhibitors and 57 Conference sessions, INTERFACE is *the* major gathering of users and vendors. Find out all there is to know about...

- Local area networks
- Front ends and modems
- Policy and regulatory issues
- Network services
- Desktop computers
- Office systems integration
- Satellite links
- Network monitors
- And, much more!

INTERFACE '83 puts it all together.

March 21 to 24, 1983 • Miami Beach Convention Center • Miami Beach, Florida

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REPLY TODAY...PRE-REGISTRATION ENDS MARCH 7, 1983

MANAGING DEPARTMENTS IN CONFLICT

By Stephen Jacobus

One of the most destructive forces at work in the office is interdepartmental conflict.

Managers vying for leverage and for positions of increased power are as common in DP as in any other field, but the great amount of organizational change in DP tends to heighten the effects of conflict. Antagonisms between managers often produce antagonisms between departments, with degraded communication between segments of the organization and a loss of productivity. Out of loyalty, employees may forget that their primary goal should be working at defined tasks, not protecting their image and guarding territories.

In most cases, some conflict is inevitable. But can conflict be reduced to a manageable level? Is conflict always bad?

Conflict between groups — and between departments — has been of interest to managers for many years. Nevertheless, recognizing and evaluating conflict remains an arcane and poorly understood art, despite its potentially disruptive influence on productivity.

Interest in groups got a boost from research done in the '20s at the Western Electric Co. Hawthorne plant in Cicero, Ill. These studies produced some unexpected, but important results.

The Hawthorne studies began with tests on changes in the physical environment — lighting, machine speed and rest breaks. The study also used a control group, on which no real changes were made. Inexplicably, production increased for both the study group and the control group.

Failing to find the consistency they expected, the researchers began to study social factors. They focused on small groups, their formation and interaction. This was the nominal

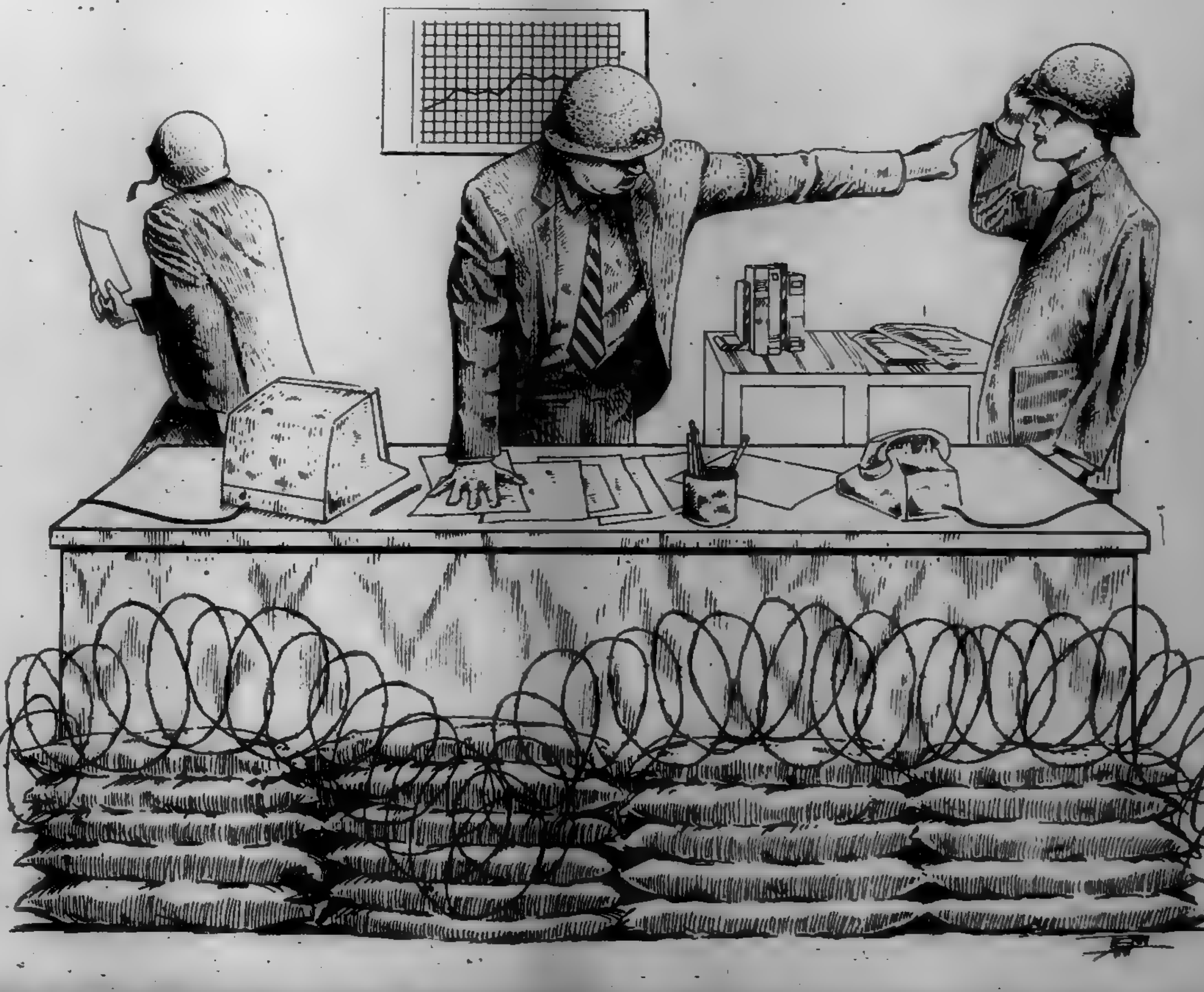
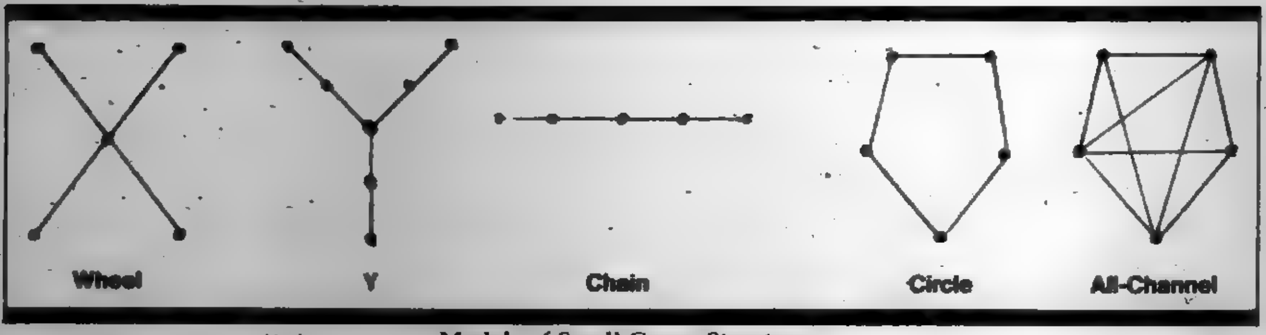


ILLUSTRATION BY RICHARD TENNANT



Models of Small Group Structures

beginning of the study of small groups and human relations thinking.

An important result of the study became known as the Hawthorne effect: that is, the introduction of researchers or other indicators of interest influenced the system, often positively. The researchers' mere presence increased productivity. This implies that isolating the effect of the research can pose complex constraints on how studies are conducted.

F. Roethlisberger and W. Dickson, writing on the Hawthorne studies, asserted that work behavior cannot be understood without examining the informal organization of the group and its relation to the total social organization of the company.

What is the "informal organization"? Typically, there are social groups cutting across departmental boundaries. For the astute manager, awareness of these informal structures may prove the key to improving communication flow between groups.

Group Structures

How are work groups usually structured? In *Behavior in Organizations* (Little Brown & Co., Boston, 1974), Dorothy Harlow and Jean Hanke offer five models of small group structures, as shown in the figure above.

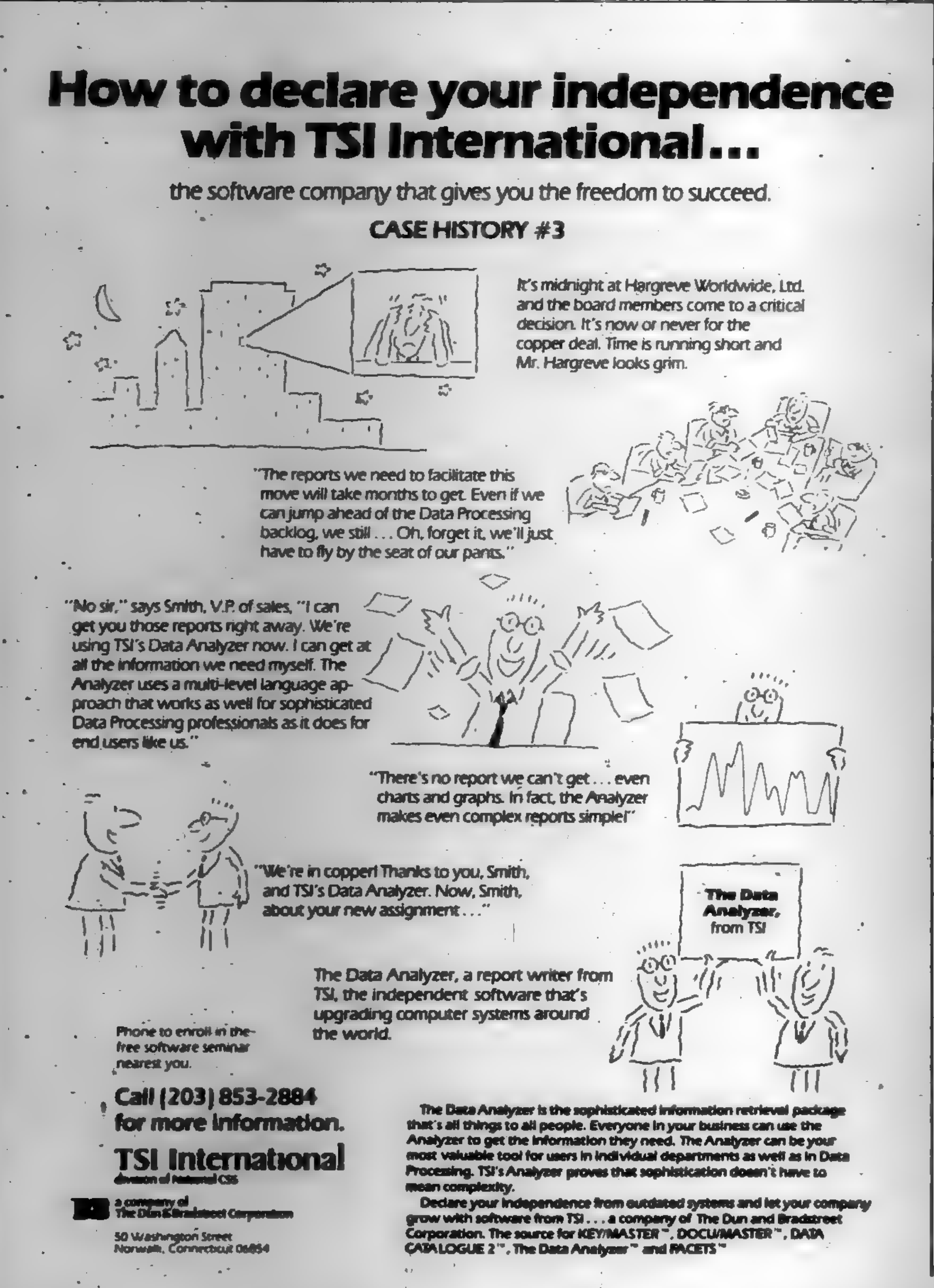
In the first three, most communication goes through one person. These are more commonly found in task-related groups. The remaining two (circle and all-channel) are rarer, even though most staff employees would like to see open communication between members. When one of the members is a supervisor who is struggling for control, he may prefer the wheel or Y group, with himself at the pivotal position.

Which of these is most efficient? When communicating with other groups, the wheel and Y patterns are preferred, with the communicator at the pivot. If the communicator has somehow been displaced from the pivotal position, though, problems arise. When a group is assigned to tackle large, multidimensional projects, the all-channel group is preferred, because of the free interchange of information.

Group Performance

Many factors influence group cohesiveness, such as one's perception of group membership and frequency of interaction. Formally defining a group by job title (for example, a group of systems console operators) is the most obvious way to specify membership, but members of such groups can have stronger allegiance to informal groups, such as a group of softball players or young, upwardly mobile employees in a certain plant.

Managers tend to think primarily in terms of formally created groups, but formal membership in a particu-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lar department does not guarantee that an employee's behavior will follow expected patterns.

Size also affects a group's work. In larger groups, the individual members interact less. However, as group size increases, the tendency for members to generate group solidarity and to give suggestions increases. As group size decreases, members show agreement, release tensions and give suggestions less.

How large is the optimal group? Of course, this depends on the tasks the group is to perform. Groups required to take action (for example, a group of managers) should consist of no more than six or seven members, while fact-finding groups may swell to 13 or 14 members without loss of efficiency.

Another factor is how similar the group members are. Most people assume that a homogeneous group performs a task best, because dissension is less likely. Many managers, however, seem to prefer a mixture of younger and older employees with varying amounts of experience and some with cross-training in other areas. Others say they have little choice but to take the best candidates, regardless of these factors.

In *Behavior in Organizations*, Harlow and Hanke claim that extreme heterogeneity within groups impedes the development of members with low status. In these groups, managers have to make special efforts to bring junior members along, lest they languish and develop too slowly.

Group Norms

A number of writers have stressed the development of group "norms" as inevitable. A norm is a group consensus of sanctioned behavior — often a sign of allegiance to the group.

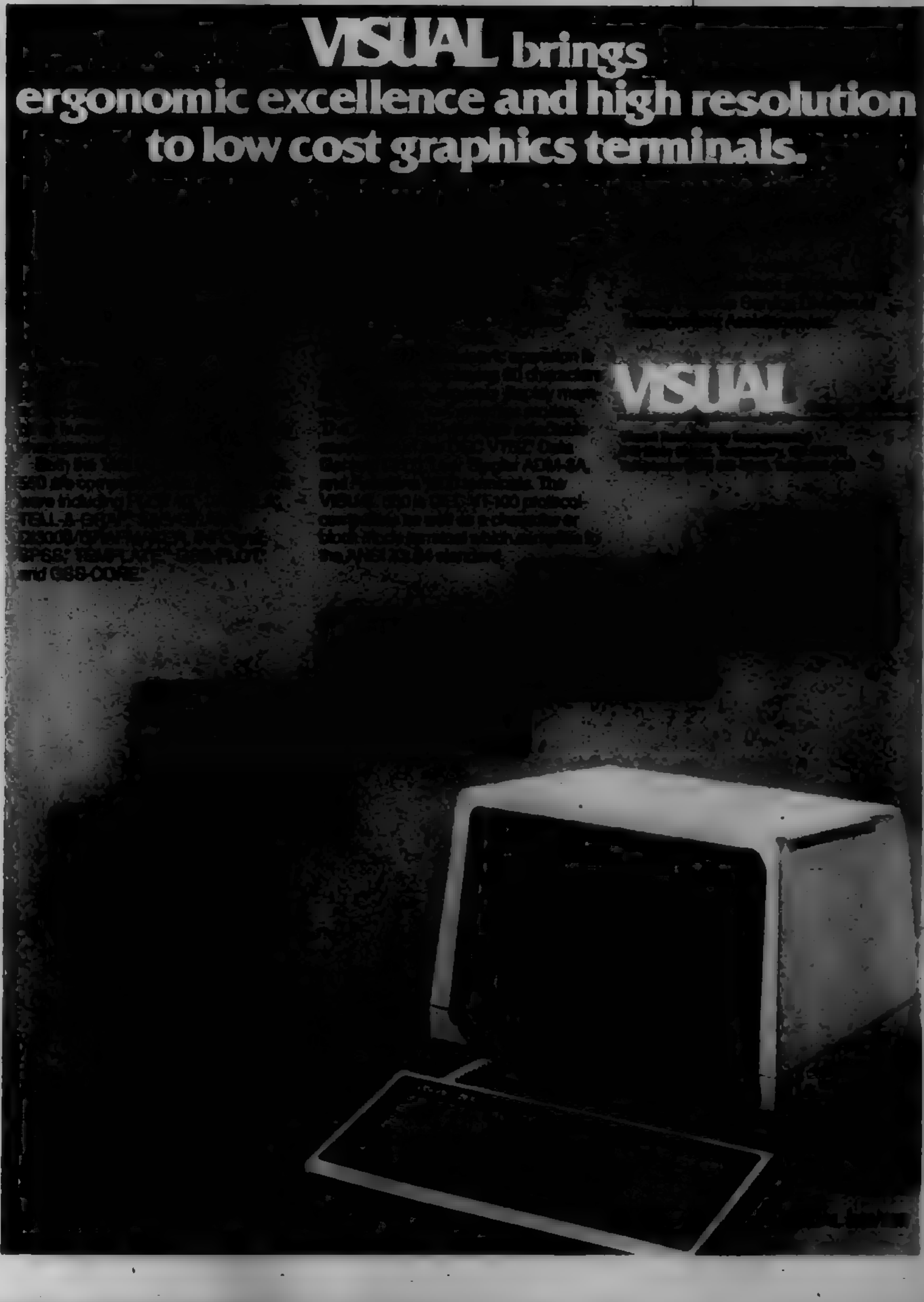
For example, the new worker who strives for high performance may exhibit behavior that runs directly against the existing group norm. When this happens, senior group members tend to force the new member to conform or they eject him, either socially or physically.

New members whose behavior is in conflict with group norms can try to change the existing norms (which is very difficult), change their own behavior, form a subgroup with competing norms or leave the group. In such a situation, the pressure on the employee can be quite intense, since he may be only dimly aware of the norms.

When the norms run counter to the requirements of management, the employee tends to follow the group. This can be especially tough on the new employee, whose status may still be low in the views of both management and the group itself. However, all norms do not have a negative impact on the employee's performance: Some groups have norms for high performance.

Robert Blake has studied the interface between business groups extensively. He reached the following conclusions in *Productivity: The Human Side*, (coauthored with J.S. Mouton) and *Managing Intergroup Conflict in Industry* (authored with Mouton and H.A Shepard):

- When two groups compete for goals, the competition initially energizes group output.
- Prolonged competition between groups ultimately results in hostile feelings.
- Group norms coalesce and solidify into stereotypical attitudes toward the other group, hindering accurate perception of roles and abilities.
- Internal solidarity within the group increases, and loyalty of members is expected to increase.
- Interaction between competitive groups affects the overall organization.
- Intergroup hostility can be reduced by requirements for cooperative behavior toward common goals. Simply "renaming" the new goals as aims that require cooperation, however, increases hostility.
- The appearance of a win-lose norm within a group causes distortion of judgment, including the members' view of the group's abilities and output.
- Contact between groups in an attempt to clarify the conflict, especially without mediation, increases conflict.
- The leaders of the victorious



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group are granted even more power. In the losing group, the leaders are attacked by group members. This follows initial attempts to attack the mediator or manager.

Two other crucial conclusions arose from the research. First, the use of a mediator without clearly defined authority to resolve specifics intensifies the conflict, often requiring further outside intervention.

Second, companies frequently ignore the existence of and the need for formal organizations within the company. These are sometimes small groups, however tenuously defined. Recognizing these informal organizations may be necessary for optimal communication with another department. When managers insist on going through channels, they often omit the informal processes that aid communication.

Categories of Conflict

There are three basic categories of conflict between groups:

1. "Vertical conflict" between parties at different levels, such as the manager and his subordinate group.
2. "Horizontal" conflict between groups on the same general level (for example, between field engineering and operations or between systems support and systems development).
3. "Role conflict," in which two or more groups have overlapping or ill-defined responsibilities, leading to battles for control.

Some managers have less than ideal amounts of authority. The reluctance of their superiors may put managers in a weak position to demand absolute control over their employees.

A programming supervisor may feel the need for greater control over his staff, but because he has found it difficult to hire experienced people, his superior insists that he coddle his people to reduce turnover. This request results from the fear that the loss of key employees will make already tight project schedules impossible to meet.

In this situation, the employee can wrest considerable control from his supervisor. Control over what? The time he reports for work, how independently he works or even changes to the team's structure. This is clearly a bad situation and points out how loss of support can hinder the supervisor's ability to do his job.

Confused messages to the employee may also result in vertical conflict. The manager of communications support may formally instruct his employee to make an all-out effort to meet deadlines in implementing a new software package. However, the manager's somewhat panicky reaction at system failures forces the programmer to coach the operations staff at the expense of the project schedule. The manager's noticeable relief when the system difficulties are corrected (through the programmer's efforts) conveys the message that the programmer should indeed spend time supporting the operations staff.

A frequent cause of horizontal conflict is overlapping responsibility and interdependence. When two departments in a DP organization — for example, support and operations — are responsible for keeping the system up, blame for bringing the system down and rewards for the rescue effort are fought over with considerable energy.

When the operations department provides its own training and the training department wants to enlarge its area of responsibility, cooperation between groups is not expected, unless some factor intercedes to make a change advantageous to both.

Role Conflict

In truth, role conflict can be either predominantly horizontal or vertical. In the examples given above, it is principally the *role* of the employee or department that is being questioned by another employee or group. Confused communication is the primary cause of role conflict.

The programming supervisor may see himself as the person who prods employees to meet deadlines. The supervisor's boss, however, may feel that the supervisor's principal role is to preserve the integrity of ongoing projects by making the company an attractive place to work.

The manager sees his support pro-

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grammer in the role of the software implementer. His hidden message to his employee is: "You are also in the role of operations support. Do both jobs." The employee may feel that he cannot or should not.

Both the operations and support group may feel that they "own" the computer system resources. Their responsibilities overlap and role ambiguity intensifies the conflict.

The operations staff may feel that it is best at training its own people. The training group may feel that its role is training, meaning that it "owns" formal responsibility for and authority over such functions.

Supervisors and managers assume a number of roles: controller of behavior, teacher, pusher/prodder, deliverer of priorities, mentor/friend, problem solver, chief technical wizard or nontechnical resource administrator.

The manager may not have made a conscious effort to choose one of these roles. But when this role is in conflict with that of another employee or group, communication problems are the most frequent underlying cause.

> ***'Both the operations and support group may feel that they "own" the computer system resources. Their responsibilities overlap and role ambiguity intensifies the conflict.'***

Causes of Conflict

All organizations experience a certain amount of internal conflict. However, long-term internal conflict may have a strong impact on work flow. Unfortunately, it is inherently difficult for an insider to assess the cause and nature of such conflict.

Nevertheless, writers such as J.M. Dutton and R.E. Walton, M. Dalton and H.A. Landsberger have identified the following seven major determinants of conflict within organizations:

1. Task interdependence. Task interdependence is the extent to which two groups depend on each other to perform their tasks. For example, the operators of a communications network depend on the hardware troubleshooters when performing a routine network test. The more interdependent the groups are, the more they will develop some system for interacting that tends to escape management control.

In some cases, the independent group has little incentive to cooperate with the dependent group. For example, engineering may have no desire to communicate with sales, but sales will frequently need information from engineering.

2. Conflicting performance measures. When organizational goals conflict, intergroup conflict can arise. It may be crucial for the programming manager to complete his project quickly, but the operations manager may demand that the new system be delivered with a complete set of documentation and training materials. Ambiguities in determining blame for production errors and in criteria for evaluating group performance can also produce conflict.

3. Differing group norms. The degree of differentiation, such as tight vs. loose controls on employees, valuing new ideas vs. customer relations or tight vs. loose scheduling, produces more potential for conflict.

In *The Men Who Manage*, Dalton suggested that a division exists in today's organizations: Some tasks require highly impersonal communications, clear job authority and emphasis on rules and specialization. Others require a more human orientation.

Modern companies have to deal with both categories of tasks, and conflict can result from these discrepancies. This raises the question: How does one decide which jobs should be managed in a human, as opposed to an authoritarian, style.

4. Job or growth inequities. When there are notable inequities

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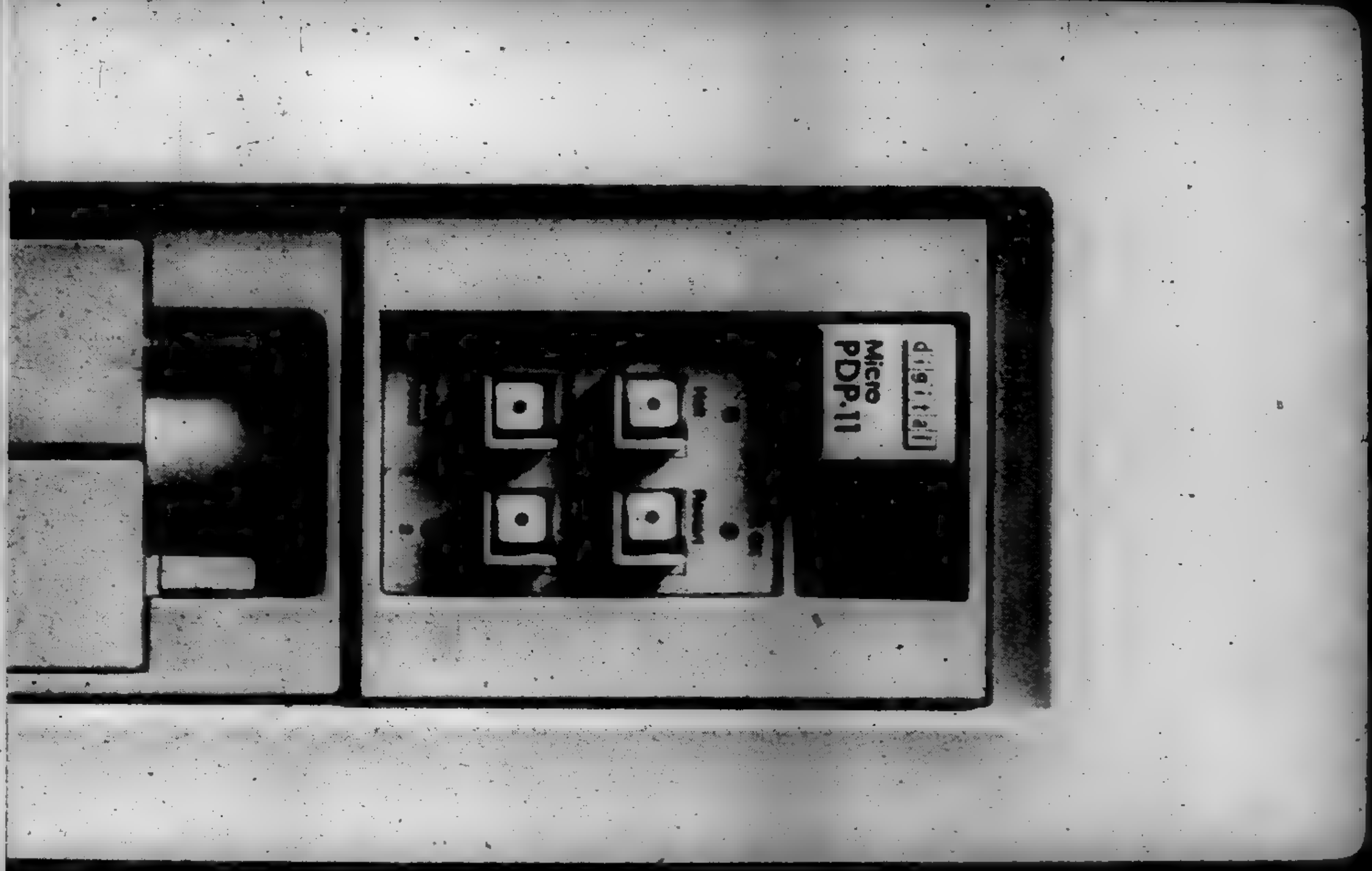

between jobs in different groups — such as salaries, opportunities for advancement and status — conflict can arise.

Furthermore, when one group is dissatisfied with its tasks, ambiguities in the definition of the boundaries lead to conflict. When more than one group within an organization produces documentation, ambiguities can tempt the dissatisfied group to begin maneuvering to achieve control and increased status.

Uneven distribution of information to groups causes conflict. However, the real issue may be the group's perception of power: Conflict occurs when a group feels relatively powerless compared with a second interdependent group.

5. Competition for resources. When certain resources or funds are sought by separate groups, conflict arises. However, if the groups are interdependent, there is an opportunity to resolve the conflict. Lack of mediation by an outside authority can cause open conflict.

6. Social and personality boundaries. A variety of gaps between departments are attributable to differences in the employees in different groups. Personal differences in training, values, education, social patterns and job status increase the potential for conflict.

For example, the staff in the programming department of a large firm is comprised of recent college graduates, principally white men and women in the age range of 22 to 26. Most have been with the firm for less than two years. A few minorities are also represented.

Their supervisor is in his early 50s, has worked for the company for nearly 20 years — since the days of unit record equipment — and holds a Ph.D. in computer science.

The operations department, on the other hand, is staffed principally by young men in the age range 20 to 22; 50% of these are non-Caucasian and have, at the most, six months of technical schooling.

Their supervisor is 28 years old and extremely bright. The supervisor also has an intuitive, unschooled ability for line management and has moved quickly in his three years with the company.

The potential for conflict in this situation is increased by the differences in group makeup.

7. Poor communication. Poor intergroup communication is both a source and a result of conflict. Communication is the pivotal aspect of internal conflict within organizations.

It is impossible to remedy conflict without dealing with intergroup communication, since conflicts are usually self-perpetuating through communications channels, even if the problem originated elsewhere.

Approaches to Conflict

Approaches to conflict resolution fall into two general categories: direct discussions between groups involved in the conflict and changes to the organization's structure.

Since it is best to learn as much as possible about the problem before devising solutions, the data collecting approaches should be tried first — brainstorming, negotiation and mediation.

In a brainstorming session, representatives from the two groups are brought together by a mediator and are requested to generate as many possible ways to view the problem as they can.

The mediator insists that the ideas be generated without passing judgments on the ideas' validity. This puts the two groups in a situation in which a common goal is required and temporarily eliminates the need to choose "the best" idea.

Later, after the group has developed cohesiveness through this process, efforts continue to select workable ideas from the list.

When groups come to discussion sessions with a win-lose point of view, the group with the greatest power and debating skills wins. The chance for effective compromise decreases significantly.

These negotiation sessions turn into power plays, and one group's cause is forced at the expense of others.

Mediation through the use of a third party can be structured so that solutions are traded without taking

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risks (asking for brainstorming sessions may be viewed by some as a risk).

Because of their similarity, these three approaches can be combined into one general approach, with the variable being whether or not to use a third-party mediator or a group leader.

Some organizations use an outside party as the mediator, such as a consultant. On the other hand, others feel that a manager or other employee outside the sphere of conflict can be an effective mediator.

Such meetings are much more productive when the participants are given an agenda in advance. The mediator can be quite helpful in drawing up that agenda.

A second set of approaches to conflict involves changes to the structure of the organization. The structural change need not be dramatic, but it should constitute an attempt to apply a solution. Solutions are premature if the problem has not been properly diagnosed.

Organizational approaches to conflict include the following:

1. Issuing a management order. While it is not always feasible or desirable to issue a managerial directive to resolve the problem, competitive struggles and ambiguous role conflicts are often the result of the lack of a clear statement from management.

2. Reducing group interdependence. Reducing the interdependence between departments is a possible structural method for dealing with the conflict, but it is often expensive. The cost is high because redundant work cycles may be created, with a corresponding growth in expenditures for personnel and overhead.

3. Merging the conflicting groups. Merging the departments under one overall authority may result in directing the goals of the two groups away from competitive activities and toward more cooperative efforts.

In this situation, though, the conflict may resurface later in another form. It is rare that an organizational change can completely resolve conflict, unless ambiguously defined responsibilities were at the root of the conflict at the beginning.

4. Buffering intergroup activity. Buffering the interaction between departments is sometimes possible when the output from one department becomes the input for another. This typically requires rescheduling output cycles. If time pressure has been placed on a group to implement new or revised systems, but the implementation must wait for certain paperwork to be completed in another group, these two groups are interdependent.

Scheduling changes and formal notification may help make it clear that all paperwork must be completed by a certain date so that implementation is not delayed.

5. Using a coordinator. Appointing a coordinator (one individual) to act as a go-between for the two departments is a highly successful technique for resolving intergroup conflicts. The candidate for this position may require special interpersonal qualities, however, to handle the conflicts efficiently.

6. Creating an integration group. Creating a formal integration group that coordinates the efforts of the two departments is a more sweeping method of resolving intergroup conflict.

These last two solutions have had the greatest success of the changes to structure.

Managers need to develop skills in recognizing and evaluating conflict and the potential for conflict. DPers, in particular, tend to focus on technical problem solving at the expense of interpersonal issues.

A better understanding of group interaction will help put a lid on conflict and boost efficiency in their organizations.

About the Author

Stephen F. Jacobus is administrator of the Employee Assistance Program at Dun & Bradstreet Operations in Berkeley Heights, N.J. He has 17 years' experience as a consultant/writer and psychologist with such organizations as IBM, Honeywell, Inc., National CSS and the U.S. Army Electronics Command.

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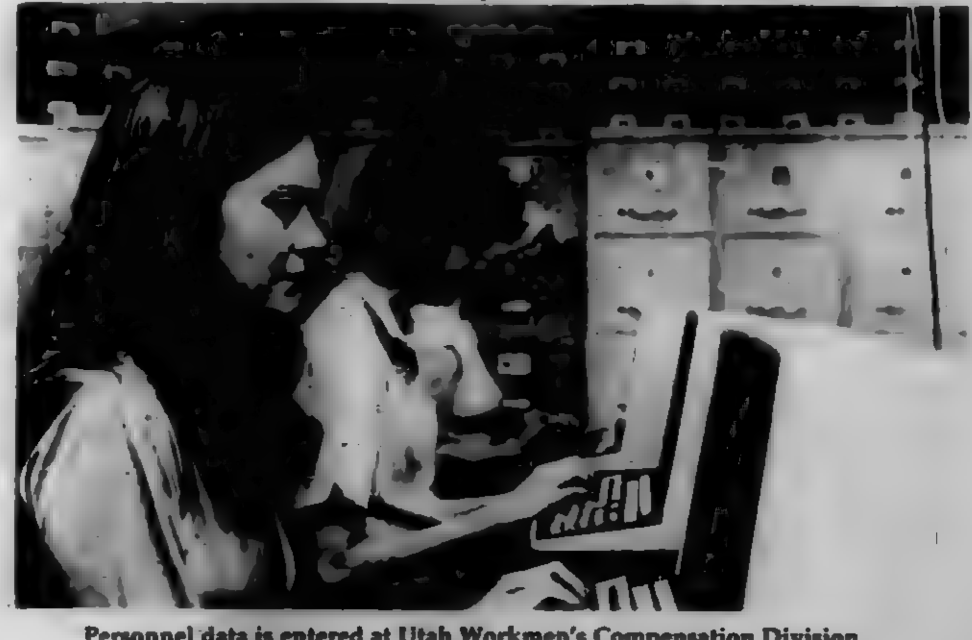

Personnel data is entered at Utah Workmen's Compensation Division.

SALT LAKE CITY, Utah — Lani Moffat used electronic filing of microfilm images of department documents here to break up a paper logjam that had her division tied in knots.

Moffat, administrator of the Utah Workman's Compensation Division, keeps track of records for all state industrial accident insurance claims. Handling hundreds of paper forms on a daily basis, Moffat's department was spinning its wheels with its insurance demands.

"The system was set up in the 1940s by a librarian," Moffat said of the old system. "We had closed files, open files, Supreme Court files, Combined Injury Fund files, [and so on] . . . The whole thing was just impossible."

So Moffat and her assistant went looking for a computer-based solution. The system that seemed to offer the most promise was an electronic filing system that combines computer and micrographics technologies. It revolved around Eastman-Kodak Co.'s IMT-150 microimage terminal, a Wang Laboratories, Inc. minicomputer and a software package from California Information Processing called Miracle.

The Miracle software is a data base management system that can be customized for the user's particular needs, according to Moffat. This enabled her division to retrieve and reference files easily, she said, and eliminated all the duplicative information that so weighed down their operations.

"It was the first demonstration we'd seen that worked," Moffat recalled of their search. "At most others, we found something that didn't fit in well with our plans."

The system has also been easy to cost-justify, Moffat said. With the installation of the system and revisions in procedure, the division has been able to handle increases in filing claims between 15% and 75% with no increase in staff, according to Moffat.

"It used to take a clerk eight hours each day to file the 300 to 500 incoming medical reports," Moffat said. "Now that same clerk finishes those reports in just two hours," with the help of the Kodak Recordak Reliant 750 microfilmer.

Subsequently, service has been greatly enhanced, she continued. "The whole point of workman's comp insurance is to give the injured worker a speedy remedy," which the system has helped them deliver.

Another added benefit of the system's improved efficiency: after clearing

(Continued on Page 66)

Storage Systems Said to Increase Series 1100 Processing Power

BLUE BELL, Pa. — Sperry Univac has unveiled two semiconductor-based storage systems that reportedly significantly increase the processing power of the company's Series 1100 line.

Configurable as either a single- or dual-channel subsystem, the Semiconductor Auxiliary Storage (SAS) device's data is accessible in less than one millisecond, which the company claims is "thousands of times faster than was previously available in rotating storage devices." A spokesman noted that one of the unit's cabinets is capable of storing a minimum of 917,000 words and is expandable up to 3.6 million words.

The spokesman added the SAS is ideally suited for users continually accessing files such as rate tables and directories for data bases.

The second storage system is dubbed the Medium Performance Cache/Disk, which contains either one or two Type 5057 cache/disk processors with one cabinet of semiconductor storage. In this mode, according to the company, the storage is used as a cache to store data requested from the vendor's Models 8450, 8470 or 8480 disk drives.

Explaining how the device operates, the spokesman said the original request for data is transferred directly to the CPU. While that transfer is taking place, that same data, as well as adjacent information, is being stored in the cache. Consequently, subsequent service calls can be made to and from semiconductor storage without the delays inherent in reading/writing to movable-head magnetic units, he explained.

Purchase prices of SAS range from $46,290 to $104,700, depending on configuration. The Medium Performance Cache/Disk carries a $103,150 price tag. Under the terms of a five-year leasing agreement, users can lease the two products for as low as $927/mo and up to $2,105/mo, the spokesman said.

Both products are scheduled for an April release, the vendor said from P.O. Box 500, Blue Bell, Pa. 19424.

Utilizes Back-End Processing

High-Speed DBMS Introduced

BATAVIA, Ill. — Uniq Computer Corp. has introduced a high-speed data base management system (DBMS) that utilizes back-end processing and Bell Laboratories' Unix System III software combined with a Digital Equipment Corp. VAX-11 computer.

The host processor may be any member of the DEC VAX-11 series, a spokesman said. DBMS functions are carried out by the back-end processor, a Britton-Lee, Inc. Intelligent Database Machine (IDM). The IDM includes a Zilog, Inc. Z8000 processor with resident relational data model software, high-speed error check and control memory and storage module drive disk controllers with random-access memory. An optional "data base accelerator" can be added to increase processing speed. The system supports up to 64 host processors, the spokesman said.

The processors are integrated via Unibase, which runs under Unix System III and includes several levels of data management support. They include physical interconnect and network protocol between the host and back-end processors; embedded and interactive intelligent data languages; data base maintenance utilities; nonprocedural report writer and a data entry package for screen-formatted entry and data type checking.

Prices start at $120,000, including a VAX-11/730, IDM 200, Unibase software and 100M bytes of disk storage from 28 S. Water St., Batavia, Ill. 60510.

Micro Link Out For T/S Service

AMARILLO, Texas — Corporate Systems, Inc. has announced a microcomputer link to its mainframe-based risk management time-sharing service.

Called CS Micro, the risk management service allows managers and safety directors to obtain summary of their firm's risk management data, the vendor said.

For $250/mo over a three-year period, the firm will equip users with either an Apple Computer, Inc. Apple III or an IBM Personal Computer. The processors are equipped with a printer and modem. Use of the data base is billed separately on a volume basis.

The vendor can be reached through P.O. Box 3180, Amarillo, Texas 79120.

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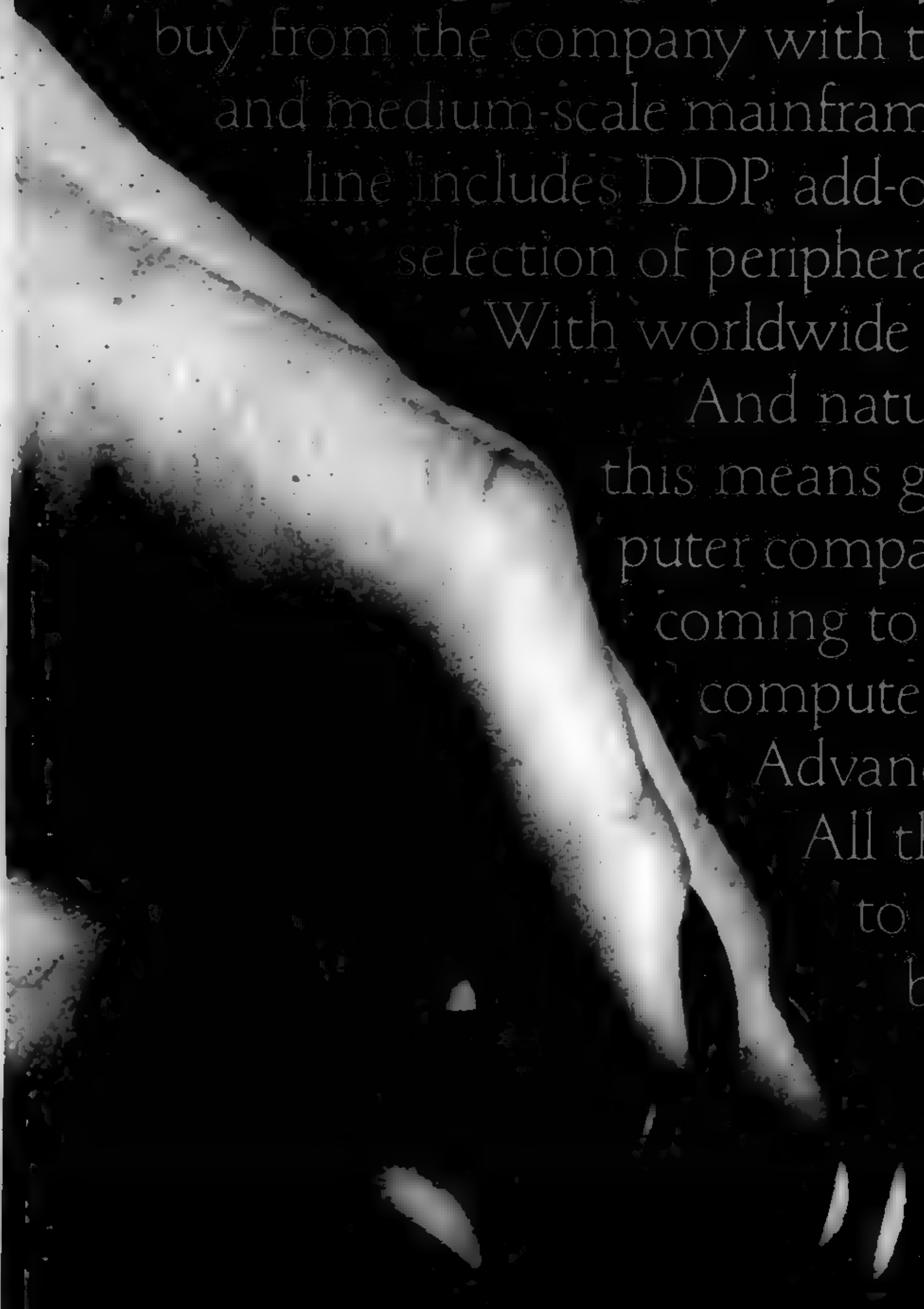

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Controls Multiple Screens

Terminal I/O System Unveiled

PROVIDENCE, R.I. — PL Systems, Inc. has unveiled Datatouch, a touch-sensitive terminal I/O system that can be configured to control any number of screens and can operate from a user's host computer, the vendor said.

The system reportedly can control terminals to display graphics such as floor plans, charts and maps in either single-color or multicolored images.

The data base is expandable and an optional built-in printer can provide an instant printout of data from the terminal, according to the vendor.

The system describes services and facilities; gives directions, costs and locations; provides schedule lists; and gathers marketing data from multiple-choice questions.

A complete system, including a microcomputer and screen terminal, is $8,500. With the optional printer, the package costs $10,000, a spokesman said. PL Systems is located at 222 Williams St., Providence, R.I. 02906.

Controller Introduced

HILLSBORO, Ore. — A module said to enable electronics manufacturers to plug a graphics display capability into such products as personal computers and industrial automation terminals has been announced by Intel Corp.

The iSBX 275 video graphics controller (VGC) is a 3-in. by 7-in. device that maintains and displays eight-color data on a raster screen and draws such elements as lines, arcs and circles.

The unit is the latest in a series of Multimodule circuit boards to plug into 8- or 16-bit Multibus (IEEE 796) data pathways (buses), as well as other systems compatible with the iSBX bus, according to the vendor.

The iSBX 275 costs $995 from 5200 N.E. Elam Young Pky, Hillsboro, Ore. 97123.

Converter For Micros Announced

NASHUA, N.H. — A desktop media converter said to allow 20 leading models of word processors and personal computers to become diskette-compatible with one another has been introduced by Itek Corp.'s Composition Systems Division.

The Converter reportedly allows users to key material on one system, store it on 5¼-in. or 8-in. diskettes and load it into the Converter, which is attached to another word processing workstation.

Transfer is made at speeds of up to 10,000 characters in under 11 seconds. Data is transferred asynchronously using a TTY-style protocol over RS-232-compatible data lines.

The Converter, with two translation programs, costs $11,500. Additional units can be purchased for $800 each, with OEM discounts available.

More information can be obtained from the firm's OEM Systems Group, located at 34 Cellu Drive, Nashua, N.H. 03063.

"Hyatt was a pioneer of local area networks. When Datapoint introduced the first one, we ordered."

—Bob Regan
V.P. Management Information Systems
Hyatt Hotels Corporation

"Local area networks are the hot topic in data processing these days. But they're nothing new to us," says Hyatt's Bob Regan. "Ours have been up and running for five years."

When Datapoint introduced the first local area network, the ARC® system, in 1977, Hyatt was among the first to install it. Today there are approximately 5,000 ARC local area networks in use, far more than any competing system.

"One reason the ARC network has been so effective for Hyatt is because it's easy to expand," says Regan. "Hyatt has had phenomenal growth, and the ARC has kept up. When more people needed the system to do more work, we simply added to the network."

The ARC local area network can be expanded virtually without limit by simply plugging in additional Datapoint processors, printers, storage disks, and terminals. Each new processor adds power to the network so new users get the same fast response the original users were getting. Companies can closely match the power of an ARC system to their needs, expanding in small, inexpensive increments instead of buying "more computer than they need" in order to have room for growth.

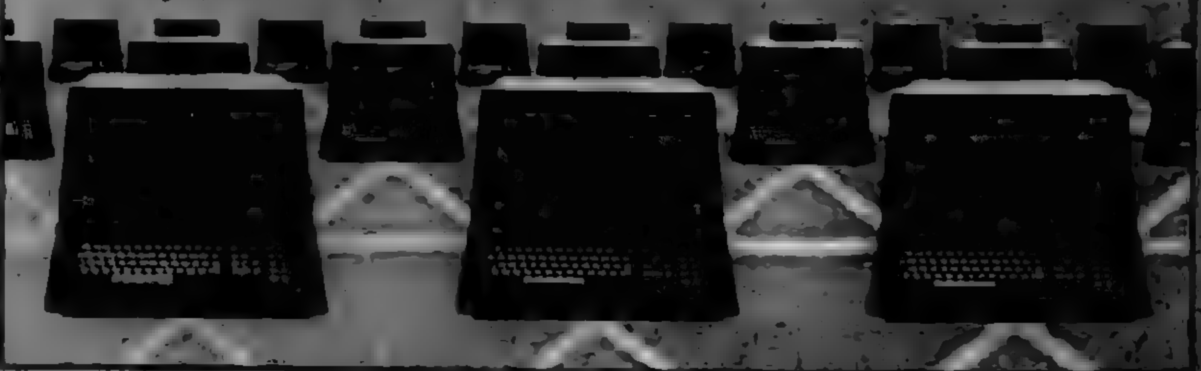
What's more, Datapoint systems can be expanded or upgraded without replacing software. "We run some programs on ARC networks that were originally written for our first Datapoint computer more than ten years ago," says Regan. "That means we didn't lose any of the money we invested in programming and training. And it made the growth steps easy on our people. The changeover to the ARC network was accomplished in only two days."

No matter how far an ARC system is expanded, all the users can have access to all the data except where security precautions are installed. So even though more and more people are using more and more computers, there's never a need to duplicate files.

"At present, Hyatt operates forty-five ARC systems," Regan says. "Others are in the planning stages right now. On the operations side we use them for accounting, reservations, and group sales. At Corporate we use them for accounting and for systems development. Obviously, we depend on them heavily. They're like the meters where we check our own financial performance. They simply have to work. And they do.

"Hyatt has stayed with the ARC system because it's been cost-effective. That's the bottom line. I can recommend a certain system to a hotel, but in the end, the system has to sell itself. And keep selling itself after it's installed. Our Datapoint ARC systems have done that."

For more about Datapoint, call (800) 531-5639. In Texas, call (800) 292-5099. Telex 767300 in the U.S.; 06966622 in Canada; or 923494 in Europe (UK). Or write Datapoint Corporation, Marketing Communications T41CW, 9725 Datapoint Drive, San Antonio, Texas 78284.



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Tabor Unveils Microfloppy Drive

WESTFORD, Mass. — A single-sided microfloppy disk drive that uses a 3¼-in. flexible diskette has been introduced by Tabor Corp. Called the TC 500 Drivette, the Tabor unit reportedly offers the same 500K-byte storage capacity of standard 5¼-in. floppy drives, but at a quarter of the size, half the weight and 60% of the power. The Drivette is plug-compatible with 5¼-in. drives. The media format — 140 track/in., 80 track/side — makes it compatible with 5¼-in. drives as well, the vendor said.

Major drive components include a direct-drive spindle motor, custom read/write electronics and large-scale integrated control logic, all built into a one-piece die-cast chassis, the vendor said.

Dysan Corp., Brown Disc Corp., BASF Systems Corp. and 3M Co. are all committed to providing 3¼-in. media for the Tabor drive, according to the vendor.

Evaluation units are priced at $315 each. Tabor is located at Lyberty Way, Westford, Mass. 01886.

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Refurbishing Service Rebuilds Disk Packs

SANTA MONICA, Calif. — International Memory Products of California, Inc. is offering a refurbishing service for disk packs.

The vendor claims it can refurbish any vendor's rigid disk pack or cartridge, regardless of size or age. It guarantees a refurbished disk for seven years.

The service costs from $40 for relatively simple disk packs to $495 for more complicated 300M-byte disk packs, the company said from 3017 Ocean Park Blvd., Santa Monica, Calif. 90405.

Financial System Debuts From Casi

LOS ANGELES — Custom Application Systems, Inc. (Casi) has developed an on-line, interactive computer system specifically designed to handle the complex reporting and monitoring requirements associated with asset-based lending and commercial loans.

The CLF/3000 system is available as a complete system using either the Hewlett-Packard Co. HP 3000 series computer or the software that is available separately.

CLF/3000 reportedly can be used as a stand-alone system for a single location or can be used in multiple locations as a distributed data processing system.

The system uses a centralized data base and single data entry format, prevents data redundancy and was designed for accounts receivable, inventory, special-term and participation loans.

Other features include the ability to update the data base on-line in real-time as soon as an entry is completed, an inherent security system, a remote spooling/printing capability that supports multiple locations and a simplified means for adding custom features.

CLF/3000 costs $55,000, a vendor spokesman said from Casi, located at 1888 Century Park E., Los Angeles, Calif. 90067.

Cartridge-Based Streaming Tape System Out

HAUPPAUGE, N.Y. — A ¼-in. streaming tape system that operates at speeds up to 90 in./sec and has a data transfer rate of up to 72K byte/sec has been unveiled here by the Qantex Division of North Atlantic Industries, Inc.

The Streamer 410 is a cartridge-based system that stores a minimum of 45M bytes of formatted data on a cartridge, according to a spokesman for the vendor. Its two-channel bidirectional tape head with a separate erase bar reportedly records data on eight tracks, the spokesman said.

Tracks are accessed by moving the tape head in small increments with a stepper motor to achieve accurate track positioning, the spokesman explained.

The Streamer 410, including controller, is priced at $1,625. Further details may be obtained from the vendor at 60 Plant Ave., Hauppage, N.Y. 11788.

Disk Subsystems Get Controllers

FULTON, Calif. — The 11 Connection, Inc. has expanded its line of disk subsystems with disk controllers designed to support Digital Equipment Corp. Q-Bus and Unibus systems.

Manufactured for the firm by Micro Technology, Inc., the controllers are aimed at users of DEC's LSI-11 and PDP-11 processors. The controllers allow users of LSI-11 and PDP-11 systems to use 11 Connection's tabletop slim-line disk subsystems, according to the vendor.

The subsystems can support two slim-line 8-in. floppy disk drives or a single full-size disk drive. Single- or double-sided drives can be used, the vendor said.

Disk subsystems cost from $1,800 for a single-sided floppy disk subsystem. The vendor can be reached through P.O. Box 249, Fulton, Calif. 95439.

Electronic Filing Frees Logjam

(Continued from Page 61)

through the division's backlog of work, it found approximately 20 cases of fatalities that had never had orders written on them. The Second Injury Fund is financed in part by money that carriers pay into the fund when there is a fatal on-the-job injury not involving dependents. "So we were able to collect from $225,000 to $304,000 for that fund in one day by simply gaining the time to go through files and pull those cases," Moffat related.

Furthermore, Moffat has plans for the system in the future. With the information available in the data base, she feels that it must be possible to develop a statistical program that will analyze how long it takes to go through all the processes that are a part of handling claims and to develop standards from that information. She thinks that such information would allow the legislature to draft laws to improve further the handling of workmen's compensation cases.

Course Creator Aid Out From CDC

MINNEAPOLIS — Control Data Corp. has released a packaged hardware/software configuration that is said to enable authors who are not trained programmers to create computer-based courses.

The Plato Author System consists of a fully configured CDC 110 microcomputer and offers two major courseware options. The first, PCD1 (Plato Courseware Development), enables the user to develop and deliver courses completely on the micro. The option provides a tutorial lesson model, a drill and practice model and a situation simulation model, according to a CDC spokesman.

PCD2 (Plato Courseware Development and Delivery) allows on-line development for both on-line and micro delivery. Micro executors for the Apple Computer, Inc. Apple II and the Texas Instruments, Inc. 99/4A will be available in May; an IBM Personal Computer executor is to be released in September. The option includes Summagraphics Corp.'s Quickdraw and Bit Pad One graphics tools.

The Plato Author System starts at $20,000 from 8100 34th Ave. S., P.O. Box 0, Mail Station HQA02I, Minneapolis, Minn. 55440.

Z-89 Desktop Price Trimmed 20% by Zenith

GLENVIEW, Ill. — Zenith Data Systems Corp. has cut prices by 20% on its Z-89 8-bit personal desktop computer, which will now sell for $1,999.

Included with this microcomputer is either the Digital Research, Inc. CP/M operating system or Zenith's Hdos operating system, and Microsoft, Inc.'s Basic and Sorcim Corp.'s Supercalc electronic spreadsheet software, the vendor said. It also comes with a built-in video display and 5¼-in. floppy disk with 100K bytes of storage. The unit has three serial I/O ports, external disk drive ports and 48K bytes of random-access memory, expandable to 64K bytes.

The vendor is headquartered at 1000 Milwaukee Ave., Glenview, Ill. 60025.

Layout Model Available

WEST BABYLON, N.Y. — A three-dimensional layout model for data centers is available from Modulex, Inc.

Modulex boards and components reportedly allow personnel working in a data center area to predetermine equipment location. Areas can be designated for service clearance, offices and control areas.

Kits consisting of components to lay out from 15,000 to 40,000 sq ft are available starting at $425 from the firm at 101 Alder St., West Babylon, N.Y. 11704.

Okidata Adds Two Models To Dot Matrix Printer Line

MOUNT LAUREL, N.J. — Okidata Corp. has enhanced its Microline 84 dot matrix printer line with the addition of two models.

The Step 2 systems feature full compatibility with Micropro International Corp.'s Wordstar and Visicorp's Visicalc software, the vendor said. Other improvements include a switch-selectable interface, select/deselect control, a Spanish character set and forward-feed superscript/subscript printing.

Pricing starts at $1,395 on Step 2 systems. Additional information can be obtained from Okidata at 111 Gaither Drive, Mount Laurel, N.J. 08054.

Printer Out From Iquad

LOCUST VALLEY, N.Y. — Iquad Co., Inc. has unveiled a daisywheel printer reportedly capable of speeds up to 65 char./sec.

Unlike other daisywheel printers, the Iquad printer carriage mechanism has no ribbon motor, wheel motor, ribbon cartridge or encoder to encumber its movement, a vendor spokesman said. This product can handle either fanfold paper tractor-fed from the front or bottom, or cut sheets fed from the top of the unit.

The Iquad printer is priced under $1,000, according to the spokesman. More information can be obtained by contacting the vendor, located at Duck Pond Road, Locust Valley, N.Y. 11560.

Unit Bows For S-100 Bus

GARDEN GROVE, Calif. — An error-correcting, microprocessor-based hard disk controller board has been added to Advanced Digital Corp.'s line of S-100-based products.

The Model HDC-1001 reportedly provides the S-100-based computer user with a controller capable of operating up to four 8-in. or four 5¼-in. hard disk drives. Its error-correcting capability includes a 32-bit computer-generated polynomial, which reportedly detects and corrects errors before the user is even aware of them. Prices for the product start at $500.

In a concurrent announcement, the vendor unveiled a Super Slave processor that reportedly provides a dedicated CPU for each user without putting limitations on system size.

Designed to fit in any S-100 bus motherboard, the Super Slave is said to share data with the host system only when accessing the drives or other common peripherals. It comes with its own memory, a Zilog, Inc. Z80A processor and I/O ports. This product costs $650. Advanced Digital is located at 12700 B Knott Ave., Garden Grove, Calif. 92641.

Controller Announced

GARDEN GROVE, Calif. — A disk controller that is said to interface one or two 5¼-in. Winchester disk drives with Digital Equipment Corp.'s LSI-11, LSI-11/22, LSI-11/23 and LSI-11/23 Plus microcomputers has been announced here by Distributed Logic Corp.

Designated the DQ614, the controller operates directly from the Q-bus without additional boards and emulates up to four disk drives, according to a vendor spokesman, facilitating formatted capacities to 41.6M bytes.

The DQ614 disk controller is priced at $1,695, the spokesman said. Distributed Logic is located at 12800 Garden Grove Blvd., Garden Grove, Calif. 92643.

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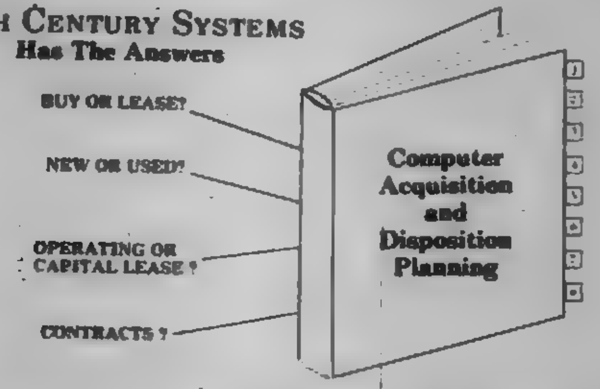
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About the Author William S. Husband President of 20th Century Systems is considered by many to be a leading expert in the field of computer acquisition and disposition planning. Formerly in sales with IBM, he has negotiated over 100 3rd Party Leases during an eight year period with the nation's largest Lessor of IBM computer systems. Many doubted his original forecast, made in 1981, of the 3083 introduction in 1982 and rapid fall in resale values for the 3033, until recently. He is used as a consultant in technology planning by major corporations in the U.S. and Canada.

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Diskstor-Q Micro Based Around DEC 11/23 Q-Bus

WALTHAM, Mass. — Comark Corp. has introduced a microcomputer based around Digital Equipment Corp.'s 11/23 Q-Bus.

The Diskstor-Q is available with a number of combinations of built-in mass storage: 8-in. floppy disks, 18M- or 36M-byte Winchester disks and ¼-in. tape cartridges.

It reportedly features memory management, 128K bytes of random-access memory , a line time clock, two serial communication channels, push/pull forced air cooling, 200W switching power supply and 18 dual-slot Q-bus card cage. All peripherals are compatible with DEC RT11 and RSX11 software, a spokesman for the vendor said.

Pricing on this system starts at $7,485, Comark said from 257 Crescent St., Waltham, Mass. 02154.

System 2000s Get Price Cuts

BILLERICA, Mass. — Lexidata Corp. has announced price cuts ranging from 10% to 20% on its System 2000 family of high-resolution raster graphics display terminals.

The Model 2400 black-and-white graphics terminal now costs $9,900, reduced from $11,000. The two-plane Model 2410 is priced at $13,600 and the four-plane version costs $14,950, the vendor said. These systems also now include 128K bytes of random-access memory (RAM), up from the previously offered 32K-byte RAM.

Further details on these products can be obtained from Lexidata at 755 Middlesex Tnpk., Billerica, Mass. 01865.

Interface Card Targets Apples

TUSTIN, Calif. — Wespercorp, Inc. has announced an intelligent printer interface card for attaching parallel printers to Apple Computers, Inc. Apple II and Apple II+ processors.

Called the Wizard-IPI, the unit reportedly gives parallel printers additional features including variable line length, left and right margins, page length, perforation skip, text screen dump and block graphics, the vendor said.

The unit mounts inside the processor and can be used with most Apple II expansion boards. The Wizard-IPI costs $87.50, the vendor said from 14321 New Myford Road, Tustin, Calif. 92680.

Optical Scanner Introduced

MINNEAPOLIS — An optical scanner that reportedly interfaces with any microcomputer, minicomputer or mainframe that supports asynchronous communication has been introduced here by National Computer Systems, Inc.

The Sentry 3000 changes pencil markings on a form into computer-readable data, according to the vendor. Its applications include testing, inventory control, surveys, order entry, sales calls and time reporting. The Sentry 3000 reportedly reads both sides of a page simultaneously and can operate at speeds of 600 sheet/hr, the vendor said.

This product is priced at under $3,000, the vendor said from 4401 W. 76th St., Minneapolis, Minn. 55440.

Storage System Thwarts Erasures

COLUMBIA, Mo. — Discwasher has introduced a floppy disk storage system said to thwart most accidental erasures and provide a safe means of transporting disks through the mail.

The Disckeeper Shielded Floppy Disk Storage System is a three-sectioned folder offering storage for two or four disks as well as the firm's Disk Drive Cleaner.

Designed to shield disks from magnetic fields of up to 500 gauss, the Disckeeper is available in three models: one for 5¼-in. disks ($9.95), another to store two 8-in. disks ($9.95) and the last for two 5¼-in. disks ($7.95).

The vendor is located at 1407 N. Providence Road, P.O. Box 6021, Columbia, Mo. 65205.

Workstation Out For CAD/CAM

WALTHAM, Mass. — Rangine Corp. has introduced a computer-aided design and manufacturing (CAD/CAM) workstation for drafting and storing CAD/CAM applications.

The CAD/CAM Workstation is housed in two cabinets and is comprised of the workstation unit, a terminal stand and a drafting board, the vendor explained.

This product sells for $2,900. Further details are available from the vendor at 14 Felton St., Waltham, Mass. 02154.

Quadmaster Diskette Out for IBM Micros

NORCROSS, Ga. — Quadram Corp. has announced the Quadmaster diskette, which is said to cut the running time of computer programs by 80% or more.

It is usable only with IBM Personal Computers equipped with Quadboard, the firm's four-function Personal Computer expansion card, a spokesman said. Quadmaster, with its Quadram Drive, costs $19.95.

The diskette is free with the purchase of Quadboard, which is priced from $595 to $995, according to the spokesman. Quadram can be contacted at 4357 Park Drive, Norcross, Ga. 30093.

Researcher Tells OAC '83

Workstations of Future to Hear and Talk

By Jim Bartimo
CW Staff

PHILADELPHIA — As office workstations become more sophisticated, they will hear, see and talk with the user, according to Howard Morgan, a researcher at The Wharton School, University of Pennsylvania.

Morgan spoke here last week on "Advanced Workstation Concepts" at a session of the Office Automation Conference (OAC '83) sponsored by the American Federation of Information Processing Societies, Inc.

"In the next three to five years, we'll see the true integration of voice technology," Morgan said, because, when all is said and done "voice is the dominant means of communication."

There are two ways this will come about, Morgan predicted. One method will integrate current telephone service with the stand-alone workstation, as has been done with the Grid Systems Corp. Compass and the Digital Equipment Corp. Professional microcomputers.

The second method will integrate voice recognition into the terminal, as Texas Instruments, Inc. has done with its newly announced Professional personal computer. However, before this method is successful, designers of workstations will have to make continuous voice recognition the standard, eliminating the need to pause after each word for the computer's sake, Morgan told the attendees of the OAC '83 session.

Predicting that vision technology will be suitably sophisticated by the late 1980s, Morgan predicted that a lens will watch the user for signs of body language, such as a grimace or a smile. "Vision systems will pick this up just as HAL did in the

(Continued on Page 72)

Wang Adds Enhancements To DVX

LOWELL, Mass. — Wang Laboratories, Inc. has announced a number of enhancements to its Digital Voice Exchange (DVX), an automated voice communications system said to allow users to receive, create and send voice messages called Voicegrams to one or more parties.

The major enhancements are:

- The introduction of the DVX Option, a peripheral device said to provide full voice messaging capability when attached to an OIS 145.
- The availability of word and voice processing capabilities on the same system that supports voice processing with the addition of Wang word processing to the DVX.
- The addition of DVX Feature Package software containing a Message Management System said to allow any-

(Continued on Page 72)

Two Modular WP Systems Introduced for Edit Pak Series

Technology International's Edit Pak System III

ORLANDO, Fla. — Technology International Corp. has introduced two modular word processing systems, one of which can be purchased as a stand-alone or as an upgrade to the company's Edit Pak System I word processor.

The Edit Pak System II features 64K bytes of working memory, document-oriented storage and retrieval, a 12-in. monitor, a 40 char./sec letter-quality, daisywheel printer, a double-sided and double-density disk drive and a CP/M operating system from Digital Research, Inc.

The Edit Pak System III features a double-disk drive that can be expanded to include a Winchester hard disk, according to a vendor spokesman. The clustering capability of both systems prove useful for multistation users, the spokesman said.

The Edit Pak System II is available for $5,995; the Edit Pak System III costs $6,495 from Technology International, 9715 S. Orange Ave., P.O. Box 13457, Orlando, Fla. 32859.

Sold in Separate Modules

Integrated OA System Debuts

ARLINGTON, Mass. — Micro Architect, Inc. has announced an integrated office automation system (IOAS) consisting of a data base manager (IDM-X), an application system (Exec) and a word processor (Word-X) for IBM or IBM-compatible personal computers using Microsoft, Inc.'s MS-DOS operating system.

IOAS is sold in separate modules so that the user does not have to pay for modules that are not needed. The system requires a dual disk storage or hard disk, a CRT, 64K bytes of memory (96K bytes for the word processor) and a 132-col. printer.

Modules are priced as follows: $198 for Exec-I, an executive information system consisting of seven applications; $398 for IDM-X; $198 for Screen Writer; and $98 for Word-X, with full-screen editor. Planned modules include graphics and a Visicorp Visicalc spreadsheet interface.

Micro Architect is located at 96 Dothan St., Arlington, Mass. 02174.

Info-Text Targets VAX-11 Series

WALTHAM, Mass. — Henco Software, Inc. has announced a document retrieval and text management system for Digital Equipment Corp.'s VAX-11 series.

An extention of Henco's Info, Info-Text is also a relational data base management system that is reportedly able to join up to 10 different files. It can be broadly applied to retrieve structured information from standard computer data files such as departmental data bases and free-form text from word processing files. The system merges selected information into one concise format for review, analysis and update, the vendor said.

The system was designed for applications in which specific information from multiple document sources must be located and consolidated on short notice for problem solving and reporting.

Info-Text uses host system data file structures and standard Ascii text files. Other features include free-text query facilities, a full-screen text editor, an optional industry-standard word processor and interactive file creation.

It costs $20,000 and requires Info, costing $14,700, from Henco Software, 100 Fifth Ave., Waltham, Mass. 02154.

WP Package Tied to Basic Four

ALBUQUERQUE, N.M. — MAI/Basic Four Business Products Corp. has announced a word processing package that is compatible with its S/10 line of small business systems.

Fully compatible with the word processing system used on Basic Four's Office Management System, the S/10 word processing package can be used in a distributed or stand-alone environment.

Features of the system include the ability to transfer documents from the S/10 to larger Basic Four systems, an electronic filing interface, full mathematical functions and keystroke storage and recall. The system also allows random page and line access and automatic headers and footers, the vendor said.

The package costs $695. An S/10 with 612K bytes of disk storage costs $4,995.

The vendor is located at 601 San Pedro N.E., Albuquerque, N.M. 87108.

Construction Costs Profile

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Workstations of Future to See, Talk

(Continued from Page 69)

movie [2001: *A Space Odyssey*]," Morgan said.

But perhaps the most significant change in workstations will be the advance of user interfaces. "In overall architecture, there are two words that keep coming up," Morgan said — "consistency and integration."

In order for users to use any workstation without retraining and for every workstation to integrate the many aspects of office information, interface advancements will take place in natural languages such as English, structured query languages and graphics, according to Morgan.

Pointing to how readily a bank customer will learn to use an automatic teller machine if he is out of money on a Saturday night, Morgan said, "People will learn to use interfaces if the product or service is useful to them."

Most of the advancements in the workstation will take place because of the dropping price of memory. "Designers knew they were making the early machines difficult to use," Morgan said, "but there was no room in the memory. Humans had to make up for what the computer could not do."

Workstations that use "windowing" to allow users to look at more than one file at once are workstation advancements, Morgan said. This capability came about because "designers finally realized that one sheet of paper scrolling up and down wasn't an accurate representation."

Wang DVS Gets Update

(Continued from Page 69)

one to deposit voice messages for DVX subscribers.

The DVX Feature Package also includes name confirmation for message senders and recipients, broadcast and blackout capability, nonuser information alert, management statistical tracking and an optional message-waiting notification terminal.

In addition, Wang announced its commitment to provide a networking capability that will connect multiple and remote DVXs together to form a single voice messaging system.

Enhancement prices are $54,000 for the DVX Option, which supports up to 250 users and is available in May. DVX with word processing, which includes the DVX Feature Package with a Message Management System, is available in 12 different models, with prices ranging from $119,300 to $248,000. More information is available from Wang, 1 Industrial Ave., Lowell, Mass. 01851.

Easy Text Out For System/34

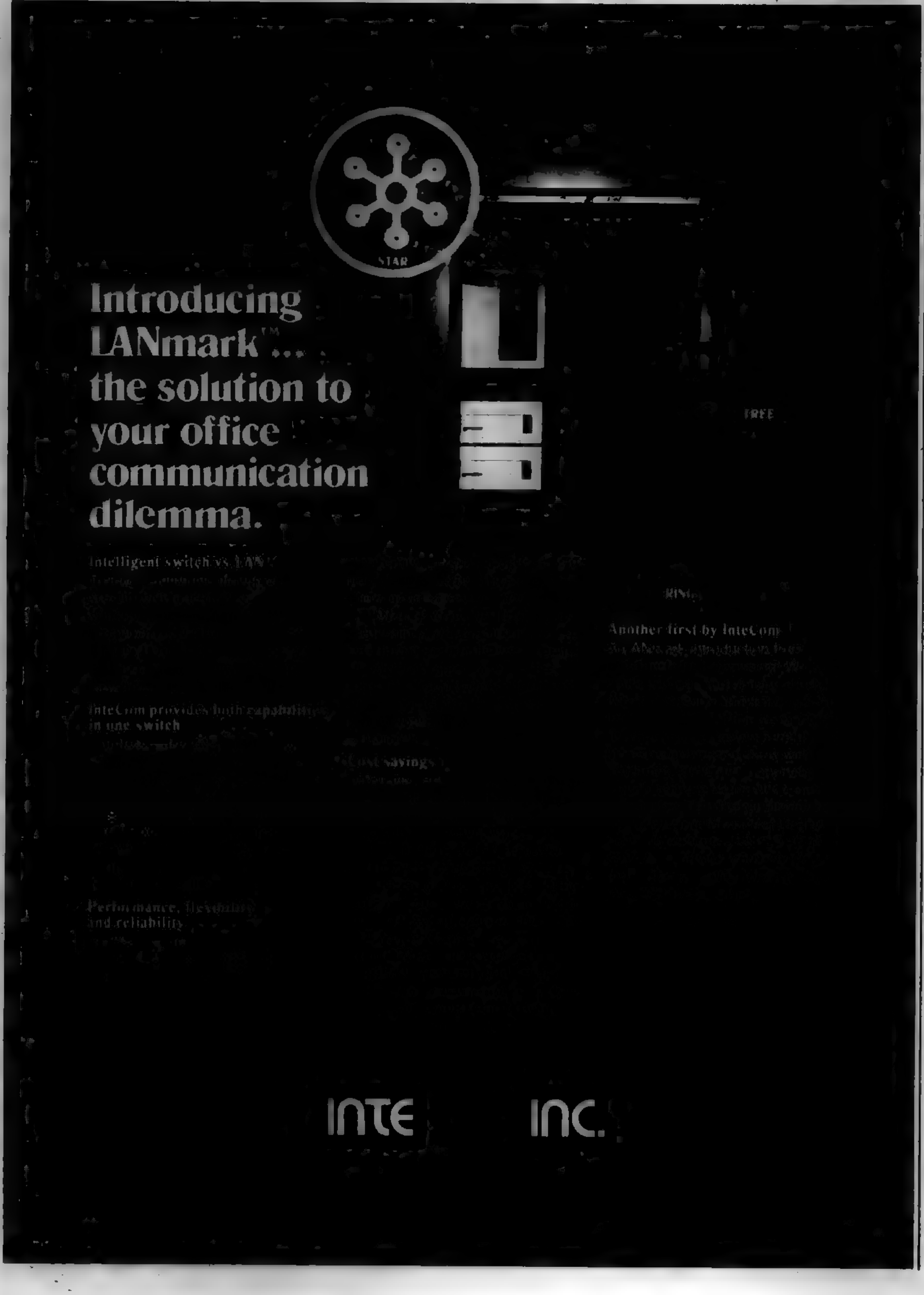
ROCKPORT, Mass. — Para Research, Inc. has introduced a word processing package for the IBM System/34.

The reportedly user-friendly Easy Text is said to tabulate up to seven columns of text or data, create lines or formats up to 132 col. wide, move or copy paragraphs and append paragraphs, the vendor spokesman explained.

Documents can contain up to 3,000 paragraphs or 99,000 lines. Easy Text needs 40K bytes of memory to run.

Easytext costs $750, the spokesman said.

Para Research is located at Whistlestop Mall, Rockport, Mass. 01966.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Reshuffling at IBM Stresses Marketing

John Akers – People-Oriented

By Bill Laberis

CW Staff

The recently announced top management reshuffling at IBM represents a continuation of a corporate reorganization launched three years ago, rather than a harbinger of changes in market or product strategy.

Analysis

That reorganization was initiated by the seven-member corporate office — the de facto power base at IBM — when Frank T. Cary handed over his duties as chief executive officer (CEO) to John Opel in March 1980. It was Cary and Opel who, in the last few years, boldly vaulted IBM into

(Continued on Page 76)

John Opel – Chairman and CEO

Separate Units Required?

AT&T Subsidiary Battle Looms

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — Whether AT&T should be required to market terminal equipment and enhanced — that is, computer-based — on-line information services through a separate subsidiary was presumably answered two years ago by the Federal Communications Commission (FCC) in its Second Computer Inquiry Decision. But now the whole issue has reemerged and is rapidly becoming the focus of a major battle.

Although the battle is mainly among competing suppliers, the outcome is likely to affect both the price and availability of many on-line products and services.

The need for a separate subsidiary has come up again partly because of Judge Harold Greene, who presided over the government's antitrust case against AT&T. Last year, Greene said the 22 Bell operating companies to be divested by AT&T early next year can market terminal equipment.

Greene did not say, however, whether the operating companies must first form separate subsidiaries. The FCC's 1980 Computer II decision requires separate subsidiaries, but this provision applies only to AT&T, not to the operating companies after they become independent carriers.

To resolve this uncertainty, the FCC last month requested comments from interested parties on whether the operating companies should be required to market terminals, enhanced services and cellular communications — a new form of mobile radiotelephone service — through separate subsidiaries. At approximately the same time, the commission decided that Cincinnati Bell Telephone Co. and Southern New England Telephone Co., which will not be divested by AT&T, can offer

(Continued on Page 74)

R&D Partnerships Offer Alternatives

By George J. Yost

Special to CW‡

A relatively simple structure has emerged as a financing vehicle for high-technology companies, especially software houses. Called the research and development (R&D) partnership, the vehicle should be viewed as an alternative financing tool considered alongside other external capital sources.

The R&D partnership is formed to finance a specific research project of an existing company. The partnership is com-

(Continued on Page 78)

Management Shakeup at Tandem

By Robert Batt

CW West Coast Bureau

CUPERTINO, Calif. — Michael Green, co-founder of Tandem Computers, Inc. and senior vice-president, has left the company amid a major management reshuffling.

Together with announcing that Green has retired to pursue personal interests, the company also announced the departure of Charles Ryle, vice-president of U.S. marketing. Ryle said he was leaving Tandem to look for a job in a start-up company.

Green joined the firm as vice-president of software development and held that position until April 1980. Since then, he has been involved with special projects, reporting to the president. Tandem says it has no plans to fill Green's position, since the projects were essentially short term and had been largely completed at the time of Green's departure.

(Continued on Page 82)

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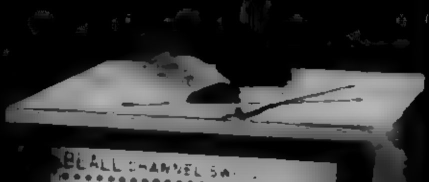

AT&T Still Battling Separate Subsidiary Rule

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Ever since the Federal Communications Commission issued its Second Computer Inquiry Decision in December 1980, AT&T has been trying to kill the separate subsidiary requirement.

That campaign began in earnest last year, when various AT&T officials, in testimony before Congress, said in effect that the phone company was being discriminated against because it alone was required to establish a "separate subsidiary" to market terminal equipment and enhanced services.

The present phase of this campaign began late last year, when AT&T filed the first of a series of petitions seeking waiver of the separate subsidiary rule to let the Bell operating companies or AT&T's Long Lines Division offer competitive products directly.

So far, the commission has waived the rule in one case — thereby allowing Bell operating companies to market terminals directly to physically handicapped customers — and refused to waive it in another — thereby preventing Teletype Corp., an "unseparated" AT&T subsidiary, from marketing terminals to domestic end users.

But three other waiver petitions are pending before the commission. One seeks permission for AT&T Long Lines to provide terminal equipment to the Department of Defense and certain federal civil preparedness agencies. Another wants "Computer II" amended so that Bell operating companies can market Centrex equipment directly. The third petition requests the commission to let AT&T offer receive-only earth stations directly.

Analysis

Underlying this latter petition is an issue that impacts data communications users directly. For a long time, the phone company and its competitors have been arguing about whether AT&T needs to own the user interface to its nationwide communications network.

In the argument over receive-only earth stations, AT&T has said that they must be offered on a regulated basis because this would allow for more efficient testing and maintenance. This is one of the major justifications AT&T has advanced for the channel service units and, as IBM pointed out earlier this month in a comment on the receive-only earth station waiver petition, the same argument was used by AT&T several years ago when it argued that every telephone subscriber should be required to lease one set from the telephone company.

The commission rejected this "primary instrument concept" then, but it remains to be seen whether history will repeat itself.

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The Xerox 2700 supports most systems that utilize Centronics 100, Dataproducts 2260 parallel interfaces and IBM bisynchronous interface protocol (2770/2780/3780).

AT&T Waging Subsidiary War

(Continued from Page 73)

terminals and enhanced services directly rather than through separate subsidiaries.

Last year, the FCC decided both companies would have to establish separate subsidiaries, but the ruling was deferred to allow time for the impact of the AT&T divestiture to be considered.

This month, the commission said that separate subsidiaries would not be required — partly because divestiture "will clearly eliminate AT&T's bottleneck" control over local exchanges and partly because neither Cincinnati Bell nor Southern New England Telephone has enough market dominance to make a separate subsidiary necessary.

Dynamic Control, IBM Join With HPMS

WINTER PARK, Fla. — Dynamic Control Corp. announced it has signed a joint marketing and installation assistance agreement with IBM for Dynamic's Hospital Patient Management System, which runs under the IBM System/38.

Under the agreement, both companies will have complementary capabilities to market cooperatively the most current version of the System/38 and hospital package to hospitals throughout the U.S. and Puerto Rico.

Dynamic Control is at 1311 S. Semoran Blvd., Winter Park, Fla. 32792.

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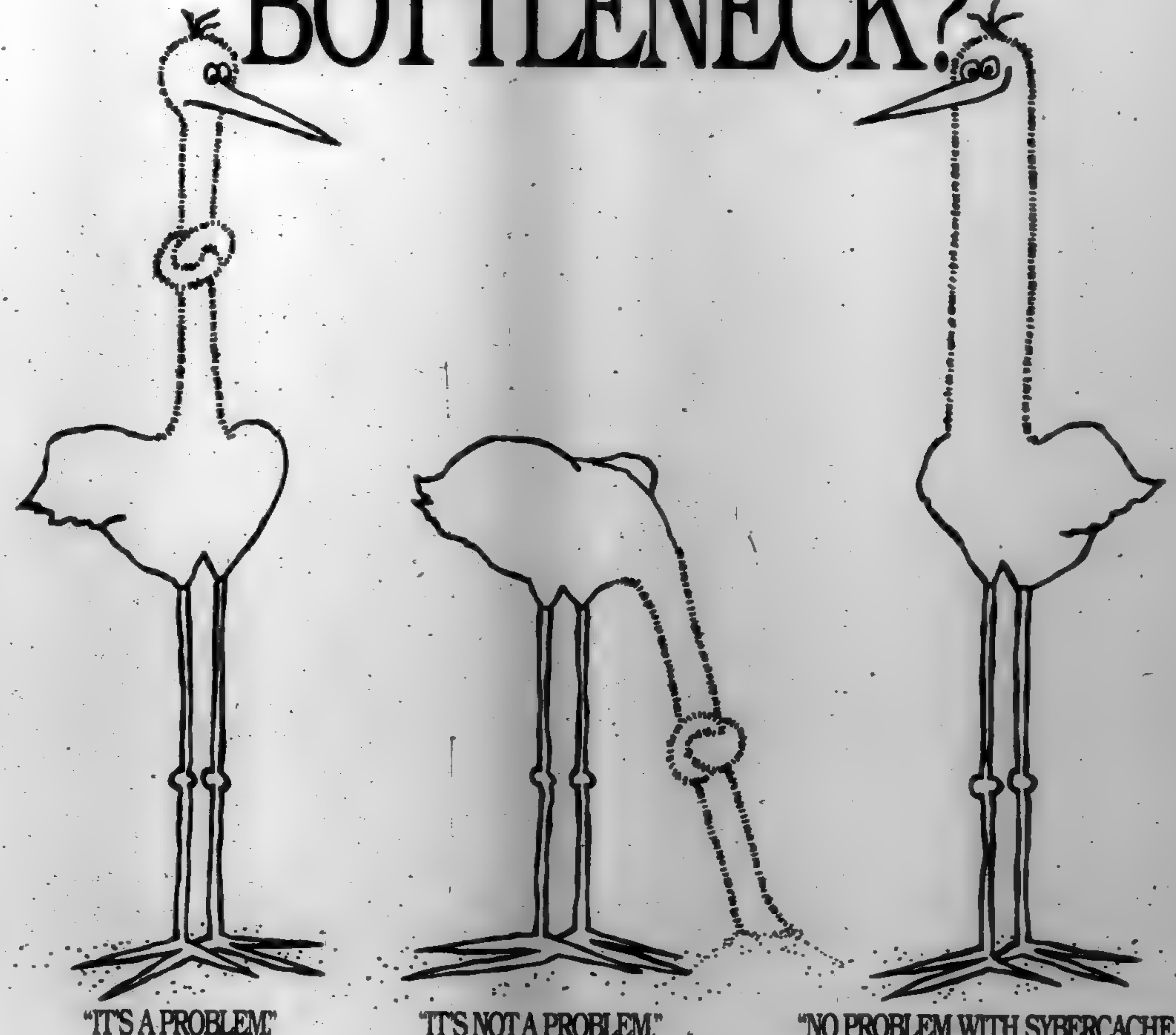

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IBM Changes Represent Continuation of Plan

(Continued from Page 73)

new, nonmainframe markets, weathering some stormy financial performances enroute.

Now, analysts say, Opel as chairman and CEO will call upon the marketing genius of John F. Akers, newly appointed president, to exploit the markets IBM has penetrated. As one analyst put it, "The company's in good financial health now. Cary's the guy who helped them get there, and now marketing will take over."

If there is genuine excitement in the analyst community about the reshuffling, it is related to Akers' promotion to president. The 48-year-old former Navy fighter pilot is now the heir apparent to the post of chairman and CEO, IBM's top slots. With IBM's "mandatory" executive retirement age of 60 (or so), Akers could eventually match Cary's decade-long tenure in the company's front office.

Akers' greatest challenge for the president's job came from Paul J. Rizzo, who was elected vice-chairman of the board at the same time Akers was elevated to president.

But at 55, observers said Rizzo may have been a little too old to groom for the chairman and CEO roles. Moreover, Rizzo's background is solidly entrenched in corporate finance in a company that bears a distinct marketing and sales brand.

"IBM has long been known as a sort of Harvard Business School of marketing for the rest of the industry," said Frank R. Gens, senior analyst with the Yankee Group in Boston.

"It's a marketing-driven organization, and the company is particularly poised now for an intense marketing effort, especially in its new areas," Gens continued. "For this reason, I suppose, the word around IBM for the past six months or so has been that Akers is the guy."

As for Rizzo, Gens said IBM "handled the loser quite well" in elevating him to vice-chairman of the board, a position that had been unfilled for over five years. But the Opel-Akers team, Gens said, is best suited to guide IBM's independent business units on a track of sustained growth.

"IBM's [management] is making it clear they want to be No.1 in each market they're competing in," Gens said.

Jack Hart, IBM analyst at the International Data Corp. in Framingham, Mass., described Akers as "very people-oriented . . . an outgoing, personable, compassionate guy . . . compared to the Rizzo reputation of being a hard-nosed, tough and financially oriented type."

Hart added that Akers has managed to avoid the 18 hour/day executive trap, instead finding a way "to balance the requirements of his job with outside needs."

Had Rizzo been named president, Hart said he would have looked for IBM to become even more price and product aggressive than it has been in the last two years. Under Akers' rule, "IBM will re-emphasize what Akers believes, which is that sales and marketing is what the company's all about," Hart said.

Harry Edelson, vice-president of the First Boston Corp., agreed that Akers is "a pure marketing guy," but less well-rounded than either Cary or Opel.

Edelson speculated that the corporate reorganization begun in the late '70s at IBM may have been engineered internally by Akers, who was thus rewarded in part with his recent appointment.

"The company is diversified in several market segments now," Edelson said, "and it needs to go from those new positions with extensive marketing. That's the challenge."

EEC Proposals Sent to IBM

BRUSSELS, Belgium — In an effort to end its three-year dispute with IBM, the European Economic Community (EEC) has sent proposals to IBM, giving the company until April 30 to respond.

The proposals are aimed at ending what the EEC has contended is IBM's dominant role in European computer markets. The EEC had sought to force IBM into disclosing certain technical data for new products at the time of its announcement, rather than when the products are actually shipped [CW, Feb. 28].

IBM has held that such disclosure would allow its international competitors to gain unfair advantage over IBM's copyright designs. The company denied EEC charges that the withholding of technical data has forced its customers to use IBM software.

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Wins Inquiry by ITC

Apple Continues Fight Against Counterfeits

By Robert Batt
CW West Coast Bureau

PALO ALTO, Calif — Apple Computer, Inc. is increasing pressure on the federal government to halt what it considers to be unfair and illegal competition of computer manufacturers in the Far East.

At the heart of the controversy are alleged counterfeit Apple computers that the company claims are being sold in Hong Kong, Taiwan, Singapore and other countries at prices well below the cost of the genuine product.

Apple has accused certain manufacturers in these countries of infringing its U.S. patents and copyrights and had asked the U.S. International Trade Commission (ITC) to initiate a formal inquiry. Last week, the ITC acceded to Apple's request, voting to launch a formal inquiry to see whether Far Eastern competitors are engaging in unfair international trade practices.

Should the inquiry conclude that imports from the Far East are, in fact, violating U.S. laws, ITC could recommend to President Reagan that the products be excluded temporarily or permanently from the U.S. market.

Firms Named

Apple has named 22 companies in its complaint to the ITC, mostly small vendors, which it alleges have infringed on patents and copyrights Three of the companies are U.S.-based and include Formula International, Inc. in Hawthorne, Calif,; North American Research Corp. in Alexandria, Va.; and Collins International Trading Corp. of Encino, Calif. One dealer, Oriental Investments Ltd., is based in Zurich, Switzerland. The rest are to be found in Hong Kong and Taiwan.

"This problem has been going on for about a year," an Apple spokesman explained. "We need to protect our trade rights and make a show of force before more well established manufacturers get into this area, and then we will have a deeper rooted problem.

"The patent area is one that is difficult to enforce internationally," he added. "If the ITC rules in our favor, we hope that will influence other countries who currently allow this illegal trade to exist."

Since Apple first brought its complaint to the attention of U.S. trade officials, between 300 and 500 "fake" Apple IIs and Apple IIIs have been confiscated at U.S. ports of entry, according to Apple.

The company wants the ITC to make a definitive ruling on the patents issue, thereby broadening the grounds on which custom officials can seize suspected products.

Already Apple has brought a number of law suits against manufacturers in Taiwan, Hong Kong, New Zealand and Australia. One company, Sunrise Computers of Taiwan, is alleged to have sold Apple II computers under the brand name of Apollo.

The trade in counterfeit Apples is flourishing, according to one industry executive who recently visited Hong Kong and who asked not to be named. The Golden Shopping Center in the middle of the colony's congested Kowloon contains as many as 80 different dealers trading in look-alike Apple computers, he said.

"There are tiny little shops, perhaps no more than 100 square feet in diameter, right next to one another," the executive claimed. "They do a roaring trade, and there is no pretense that the machines are actual Apples. Often they are sold with no brand name; all the software is pirated and documentation has been translated into Chinese, some of it of better quality than the original."

According to Dan Wendin, associate counsel at Apple, most of the allegedly fake machines in the U.S. find their way into the hands of computer hobbyists.

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R&D Partnership Emerging as Financing Tool

(Continued from Page 73)

prised of investors who provide funding, including a general partner whose primary function is the management of the partnership.

Once formed, the partnership pays a software vendor to perform research on its behalf, with the stipulation that any products developed by the vendor belong to the partnership.

In a typical royalty partnership, the vendor is granted an exclusive option to use any technology developed, with the partnership licensing the technology back to the vendor for marketing.

This royalty usually takes the form of a percentage of gross revenue derived from the sale of products developed and marketed from the technology.

It is not uncommon for vendors to place a ceiling on the royalty to be paid, allowing the vendor to purchase the technology outright for a lump sum payment. Or in some R&D partnerships, the provision is made for the partners to receive its lump sum payment in vendor stock.

The benefits of an R&D partnership can be substantial, both to partners and the vendor. Assuming certain criteria are met, the partners are eligible for a tax deduction equal to virtually their entire contribution to the partnership, often in the year it is made.

This means that the level of investor funds at risk is limited to 50% of invested capital.

But the most significant benefit for investors results from the corporation's research activities becoming commercially viable. Successful research can generate substantial income for both the investors and the vendor, both in the near and long term.

For the vendor, there is no immediate dilution of equity and usually no loss of control of the company by its founders.

The partnership arrangement may allow the vendor to control better the development and marketing of products developed. And the financial risk of unsuccessful research is borne by the partnership: It is not borne by vendor.

A variation of the royalty partnership is the equity relationship, in which the partners receive equity in the venture instead of royalty payments. While this parnership offers many of the same benefits as the royalty partnership, such as tax benefits, it also eliminates the investors' ceiling, should products developed prove successful.

The risks of R&D partnerships to both investors and vendors are also clear. The most obvious is that the research may prove unsuccessful.

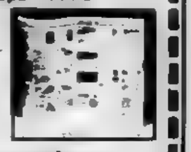
And because of the relative newness of R&D financing, there is a risk the U.S. Internal Revenue Service may challenge some of its tax benefits. The contracts, especially those in a royalty partnership, are complex, potentially leading to future litigation if the vendor is successful.

For the vendor, the royalty payment is due whether the vendor has the money to pay or not, which may be a problem because it is based on a percentage of revenues and not profits.

And the existence of an R&D partnership may make a second round of financing more difficult than it otherwise would be.

Thus, the rule for investors and vendors is to weigh the R&D partnership against other financing available and to spell out the contractual details of the arrangement, always keeping a careful eye toward both the near and long term.

Yost is a partner at the accounting firm of Coopers & Lybrand in Boston.



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DG Wins Contract Award From E.F. Hutton

WESTBORO, Mass. — Data General Corp. has bested a strong field of contenders to land a $40 million information processing system contract from E.F. Hutton & Co. DG will install 300 to 400 of its Branch Information Processing Systems based on its Comprehensive Electronic Office (CEO) and its Eclipse MV/4000 processor.

Other contenders for the contract included Digital Equipment Corp., Wang Laboratories, Inc. and IBM, according to a Hutton spokesman.

The CEO systems will permit simultaneous data base access for information retrieval, nationwide word processing, electronic mail and filing, administrative support for each office and personal computing and decision support applications for Hutton account executives, DG said.

Each CEO system will also interact with a Bunker-Ramo Corp. System 7/90 used by Hutton account executives for market data, communications and data base inquiry purposes as part of a network controlled by IBM and DG systems.

Commenting on the installation contract, J. David Lyons, vice-president and general manager of DG's Information Systems Division, said, "We believe our past relationship with Hutton, and this agreement in particular, demonstrate the quality and capability of CEO systems, as well as Data General's ability to provide large information systems users with the appropriate applications solutions to their business needs."

National Semi Gets Nod From U.S. to Acquire DTS

BOSTON — The U.S. Justice Department has given final approval for National Semiconductor Corp. to acquire Data Terminal Systems, Inc. (DTS), ending a month-long discovery period during which the government weighed possible antitrust implications of the acquisition [CW, Feb. 28].

National Semi will pay about $50 million for the outstanding shares of DTS, a point-of-sale (POS) terminal maker. DTS, a high-growth company until recently, lost nearly $10 million during the first nine months of 1982.

The acquisition, analysts said, will bolster National Semi's diversification efforts and represents a shot in the arm for the company's systems division, dedicated to the POS equipment for which DTS had become a market favorite before its fortunes began to dip in 1980.

College Gets Graphics Grant

BOSTON — The Massachusetts College of Art (MCA) has received grants totaling $69,000 for a pilot program to train graphics artists in the use of computers for design and publishing.

Camex, Inc., manufacturer of electronic composition and publishing systems here, has contributed $37,000 worth of equipment and personnel to the college. That figure has been almost matched by a $32,000 grant from Bay State Skills Center.

The pilot program will give 45 artists six weeks of intensive instruction in the operation and use of electronic composition systems.

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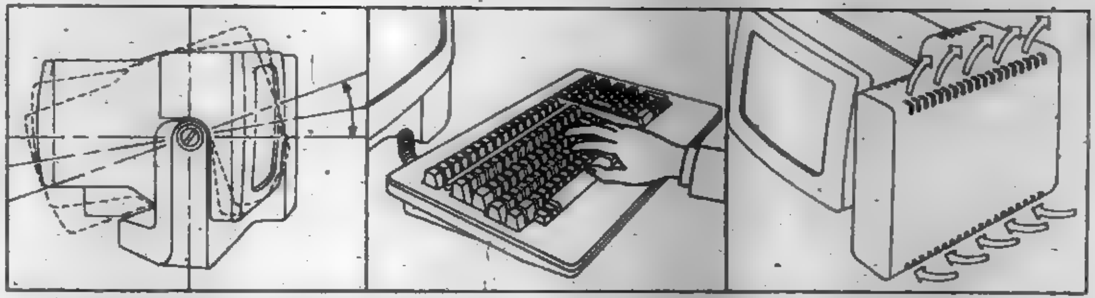

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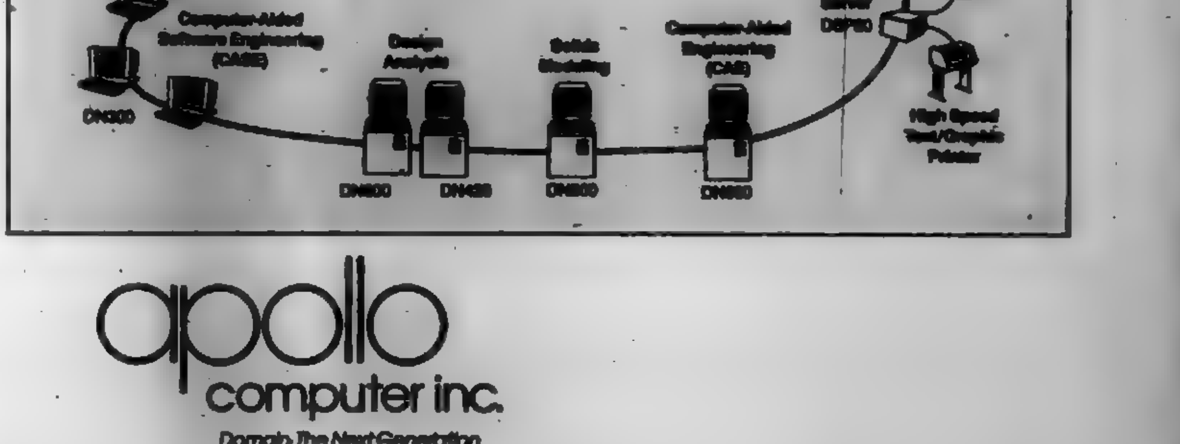
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Vertical Business Units

NCR Reorganizes Internally

DAYTON, Ohio — NCR Corp. has announced an internal reorganization in its U.S. Data Processing Group centering on the establishment of four vertical business units, placing an added emphasis on specialized selling by product line.

Each vertical business unit operates as a separate entity and markets company products through a sales and support force. Three of the new units are being established in the Commercial-Industrial/Medical Education Government Division, including the Interactive Systems unit, which sells I-Series products; the General Purpose Systems unit, which sells V-Series systems; and the Special Purpose Systems unit, which sells the Decision Mate personal computer. The fourth, ATM Systems, was established in the Financial Systems Division and will specialize in the sale and support of NCR automated teller machine products.

Boston Program Targets DP Literacy

By Susan Blakeney
CW Staff

BOSTON — A computer literacy task force here has developed a proposal for a $4.7 million project to place computer centers in every one of the city's 124 public schools during the next three years.

Marilyn Gardner, coordinator of computer programs for Boston Public Schools, led the development team, whose goal is to assure a level of computer-competency throughout the elementary, middle and high school system. At present, 8% of city students at 35 schools have access to computers, Gardner said.

The proposal calls for 15 terminals or stand-alone microcomputers for each school, staffed by teachers from the school system, Gardner explained. Boston teachers are currently being wooed into the computer science domain with 13 graduate courses and various workshops being offered with the help of several local colleges and universities, Gardner added.

The proposal also calls for funding from the School Department, the City of Boston and a number of the high-technology firms located in Massachusetts.

Comsat Shows Record Earnings

WASHINGTON, D.C. — Communications Satellite Corp. (Comsat) has announced record revenues of $409 million for 1982, a 23% increase over 1981, and profits of $43 million, a 53% increase over 1981.

The increases, Comsat said, were the result of growth in sales from the company's international communications satellite services.

Comsat's figures also reflect a drop in losses from its partnership interest in Satellite Business Systems (SBS), losses which totaled $16 million in 1982. The reduction in SBS-related losses "is primarily a result of investment tax credits that were associated with the launch of the third SBS satellite in late 1982," the company said.

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Senior VP Green Leaves Tandem

(Continued from Page 73)

Ryle has been replaced as vice-president of U.S. marketing by David Mackie, former vice-president of headquarters marketing. Mackie's former duties will be assumed by Steve Schmidt, director of product marketing.

The management reshuffle comes in the wake of a decision two months ago by another Tandem co-founder, James Katzman, to take a leave of absence from which he has yet to return.

The resignations come when Tandem is seeing some of the worst financial strains it has ever faced. Recent sales and earnings growth have fallen below historically high levels. In 1982, revenues totalled $312 million, a growth rate of 50% compared with past annual growth rates of between 90% and 100%.

A company spokeswoman denied the management changes had anything to do with Tandem's current financial difficulties. They were "coincidental but not related," she said.

Nevertheless, some industry observers have reached the conclusion that Tandem's "go for broke" growth campaign now needs readjustment.

In announcing a recent restatement of the company's 1982 revenues, which reduced the projected growth rate from 61% to 50% and earnings from $37 million to $30 million, James Treybig, company president, said, "Our old practices were designed at an early time in the company's history in a much stronger economy and have not kept pace with the tremendous growth of our business.

"Our reexamination of the year's results convinced us that with six manufacturing plants in Europe and the U.S. a more conservative approach was appropriate," the company president continued.

The slowdown has continued this year. Last month, the company reported that in its first fiscal quarter, ended December 31, revenues grew on an annual basis of 33%, to $94 million, while profits dropped 9% to $7.1 million.

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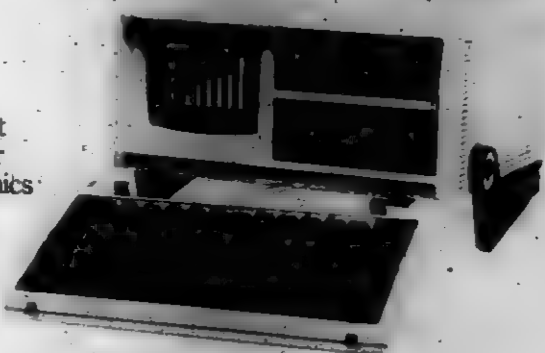

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Hitachi Extends L-Series With Two Processors

NEW YORK — Hitachi Ltd. has extended its L-series of computers with two systems that feature a 16M-byte logical address space that reportedly makes programming and system operation easier for users. The company plans to market both systems in the U.S. eventually, but declined to say when. The systems will be available in Japan beginning in October of this year.

In addition to the twb processors, Hitachi made three other introductions, including the following:

- The Virtual Storage Operating System O/Extended System (Voso/ES), which features an enhanced interactive processing function.
- The H-8591-2 disk storage unit, which has a transfer rate of 1,209K byte/sec.
- The H-8796 facsimile communication adapter, which permits facsimile users to use their equipment as data output terminals.

Through the use of 64K-bit random-access memory chips, the L-450 processor's main memory holds .5M bytes that can be expanded up to 2M bytes. Up to 520M bytes of disk storage can be added to the processor, the company said.

The system can support up to eight workstations in addition to remote workstations and is also field-upgradable to the L-470 system.

The L-470's main memory holds up to 1M byte that is expandable up to 4M bytes. The unit can accommodate up to 1,440M bytes of attachable storage and support as many as 31 local and remote workstations.

Designed to increase productivity in the office, the Voso/ES enhances vendor-developed programs such as the Relational Data Base Facility, the Nihongo-Japanese-Text Composer 2 and the Business Graphics Feature.

Using 8-in. disk technology, the H-8591-2 fixed-disk storage unit can hold up to 130M bytes per spindle, has an average access time of 33.5 msecs and a maximum storage capacity of 520M bytes.

The L-450's basic configuration, consisting of .5M bytes of main memory, a floppy disk drive, 70M bytes of disk storage, a workstation and serial printer, carries a monthly rental charge of 450,000 yen (approximately $190/mo). An L-470 system with 1M byte of main storage, a floppy disk drive, 260M bytes of disk storage, two workstations, a serial printer and a line printer can be rented monthly for 800,000 yen (approximately $340/mo).

Further information is available from the vendor at 470 Madison Ave., New York, N.Y. 10027.

Gould SEL Inks Pact With Geisco

ROLLING MEADOWS, Ill. — Gould SEL has signed a multimillion dollar contract to supply computers and communications equipment to General Electric Information Services Co. (Geisco), front-ending one of the largest telecommunications networks in the world.

Keeping up with increasing user demands was the reason for the massive equipment upgrade, Geisco said.

According to the vendor, the phasing in of Gould's Concept 32/27 CPUs will take up to 10 years, beginning this September. The computers will include a new communications model and a remote capability for unattended operaton.

Gould SEL reportedly competed against Honeywell, Inc., Data General Corp., Digital Equipment Corp., IBM and Digital Communications Corp. for the long-term contract, which the company labeled "a major communications win."

Disk Firms Back Three-In. Format

Fourteen manufacturers of floppy disk drives and storage media, including three U.S. and 11 Japanese firms, have joined Matsushita Electric Industrial Ltd., Hitachi Maxell, Ltd. and Hitachi Ltd. in supporting standards for 3-in. compact floppy disk drives.

The 3-in. format was announced by the latter three companies a year ago and was submitted to the American National Standards Institute committee in September as well as to a Japanese Industrial Standards committee in August.

The 14 companies include: Memorex Corp.; Micro Peripherals, Inc.; and Minnesota Mining & Manufacturing Co., all of the U.S., and Canon Electronics, Inc.; Fuji Photo Film Co., Ltd.; Jicoh Electronics Co., Ltd.; Mitsumi Electric Co., Ltd.; Nippon Seimitsu Kogyo Co., Ltd.; Sankyo Seiko Manufacturing Co., Ltd.; Sanyo Electric Co., Ltd.; TDK Electronics Co., Ltd.; Teac Corp.; Teijin Ltd.; and Tokyo Electric Co., all of Japan.

In another standards matter, 22 disk drive and controller manufacturers have agreed to propose a new 5¼-in. Winchester disk drive interface standard to provide higher performance, faster transfer rate and higher storage capacities. The enhanced disk interface will be a modified version of an interface developed by Seagate Technology Corp. and will reportedly double the old standard data transfer rate of 5M bit/sec.

On May 18th, *Computerworld* launches its first communications satellite . . .

. . . satellite publication on communications, that is.

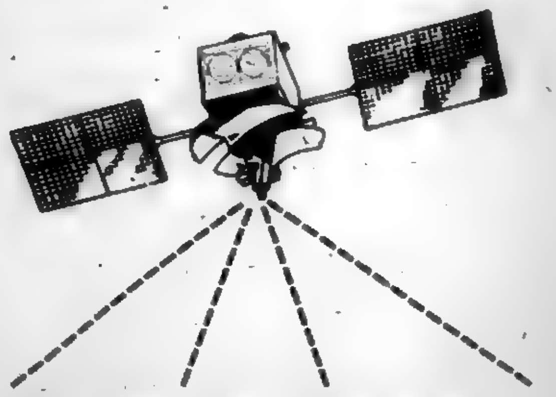
We are launching a new publication devoted to in-depth coverage of the broad spectrum of voice, image and data communications. *Computerworld On Communications* will examine communications issues, technology and applications from a systems perspective.

We recently did a study of *Computerworld* subscribers to determine their level of involvement and interest in communications. Of the 84% now using or planning to use communications equipment and services, 72% are personally involved in its selection and/or implementation. We found that these subscribers depend on *Computerworld* for communications information and prefer its coverage by more than 4 to 1 over the next publication in the field. This segment of our audience has a critical need for in-depth information on the constantly changing technology of communications.

As *Computerworld* expands its weekly news coverage of communications with interpretive information on products, equipment and services, *Computerworld On Communications* will complement that coverage with focused attention on the broader issues facing business communications users.

Computerworld On Communications will keep readers current on changing trends in the design, acquisition, operation, and optimization of corporate communications facilities. It will look at communications and networks from a systems perspective that relates technical capabilities with corporate goals.

In the two issues for 1983, *Computerworld On Communications* will apply the proven editorial resources of *Computerworld* to the area of communications networks. It will look at the implications of enhanced communications within the business organization together with the impact on established systems operations.



So, if you're among the majority of *Computerworld* subscribers who are personally involved in the selection and implementation of communications equipment and services for their organization, you'll find *Computerworld On Communications* a valuable addition to the *Computerworld* family of special publications.

As a Computerworld subscriber, you will automatically receive the two 1983 issues of *Computerworld On Communications* as part of your subscription. If you're not already subscribing to *Computerworld*, call *toll free* 800-343-5730.

Remember to look for *Computerworld On Communications* on May 18th and again on September 28th (advertising deadlines April 8th and August 19th).

For advertising information on *Computerworld On Communications*, call Bill Dwyer, National Accounts Manager at (617) 879-0700 or your local *Computerworld* sales representative.

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Forecasts & Findings

Graphics Station Boom

The market for computer graphics workstations, spearheaded by a fourfold rise in the business graphics segment, will increase 175% over 1982 levels by 1986, accounting for nearly $7 billion in sales, according to **The Computer Graphics Workstations Market in the U.S.**, by Frost & Sullivan, Inc.

The report predicted that revenues from hardware, software and related services will grow from $2.5 billion in 1982 to $6.9 billion in 1986, surpassing $19 billion in 1990. The three principal applications areas are business graphics, computer-aided design and manufacture and process control.

The report is priced at $1,275 from Frost & Sullivan, 106 Fulton St., New York, N.Y. 10038.

Bell PBX Share to Drop

Interconnect companies will account for 48% of the $10.1 billion worth of private branch exchanges (PBX) sold in 1990, beating out the Bell companies for the first time, according to **The PBX Market**, by Frost & Sullivan, Inc.

The Bell share that year is expected to fall to 42% from 48% in 1982, when the interconnects accounted for only 40% of the $2.8 billion total, the study said. Pricing of PBX systems is expected to remain steady in real terms at the current $800 to $1,200 per line, a hardware manufacturing cost savings offset by higher support service costs.

Priced at $1,275, the study is available from Frost & Sullivan, 106 Fulton St., New York, N.Y. 10038.

Competition in Local Nets

Comptitive advantage in the local-area network market will be predicated upon system performance, according to **Local Area Networks: A Strategic Analysis 1981-1990**, by Venture Development Corp.

Local nets will have to accommodate user requirements for vendors to remain competitive, the report stated. Industry shipments of 136,000 nodes are predicted in 1983, where a node refers to a cluster of peripherals such as eight terminals or eight microcomputers or one computer, with shipments to increase to 1,175,000 nodes in 1990.

The report is priced at $2,490 from Venture Development at 1 Washington St., Wellesley, Mass. 02181.

Vertical Markets Best Bet

As the microcomputer market becomes increasingly saturated with similar types of hardware, vendors who target vertical markets through applications software will have a decisive advantage in expanding their share of this competitive marketplace, according to **Vertical Strategies for Microcomputer Hardware and Software** by Creative Strategies International, Inc.

According to the report, vast potential and expansive growth opportunities exist among nine key vertical markets analyzed. Representing as much as 25% of the small business market for microcomputers, hardware and software revenues in these vertical markets will increase from $500 million in 1982 to nearly $1.5 billion in 1987, a compound annual growth of 25%.

Priced at $1,450, the study is available from Creative Strategies, Suite 275, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

DBMS Market to Boom

Independent software houses and hardware manufacturer suppliers of data base mamagement systems (DBMS) will see annual market growth of 32% over the next five years, reaching sales of $1.75 billion by 1987, according to **The DBMS Marketplace**, by International Data Corp.

The report predicted that, by 1987, traditional DBMS packages for mainframes will account for 67% of the entire marketplace for these products. Programs for desktop computers will capture a 12% share, while hardware manufacturers can expect their DBMS revenues to grow at an increasing rate over the next several years.

Priced at $2,500, the report is available from International Data Corp., 5 Speen St., Framingham, Mass. 01701.

Bell's PBX Hold Slipping

AT&T will have difficulty holding onto its already declining share of the private-branch exchange (PBX) market during its reorganization, with the former Bell operating companies no longer captive markets and American Bell, Inc., the unregulated subsidiary, not yet fully operational, according to **The PBX Industry: A Strategic Analysis**, by Venture Development Corp.

The report maintained that the AT&T market share for PBX shipments, which has already declined to 36% from previous levels of better than 75% only a few years ago, will decline still further to 24% in 1984. At the end of the five-year forecast period, the study predicted, AT&T will still be the largest single producer of PBXs, but will not attain its former dominance.

Priced at $2,790, the report is available from Venture Development, 1 Washington St., Wellesley, Mass. 02181.

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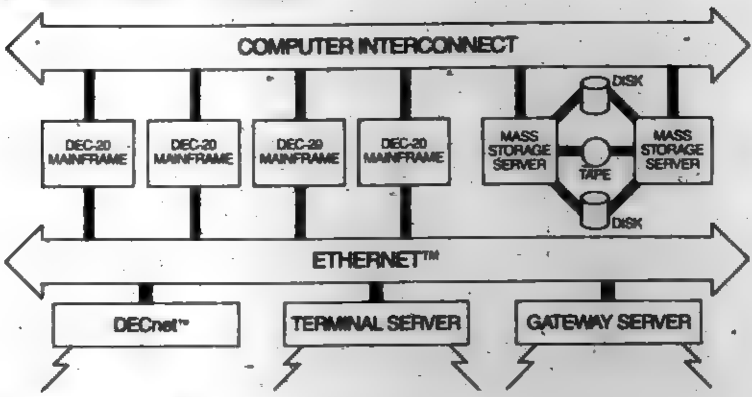

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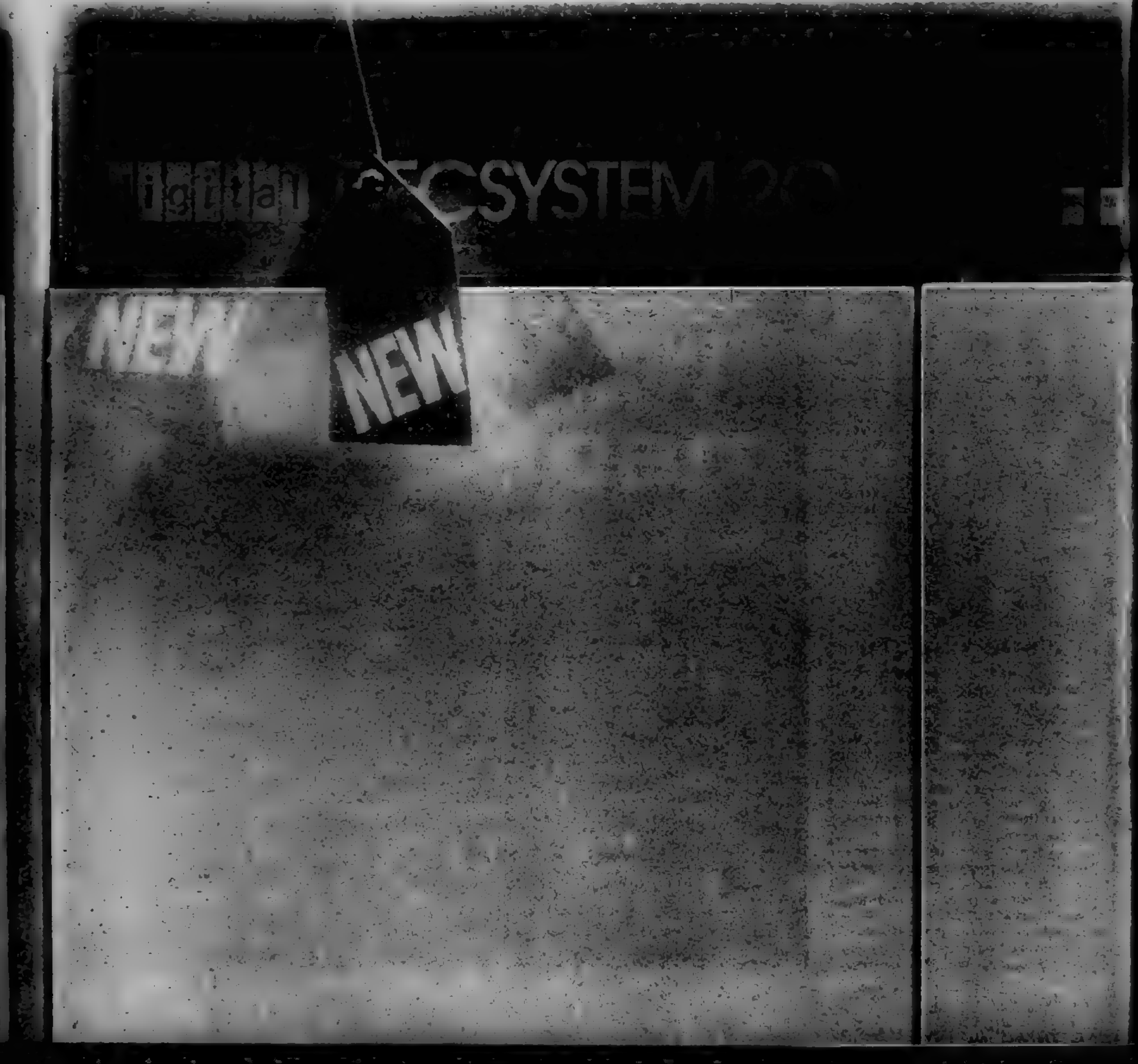

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Supershorts

National Semiconductor Corp. and **OKI Electric Industry Co., Ltd.**, in conjunction with **OKI Semiconductor, Inc.**, have signed the second phase of a long-term joint development contract covering 64K-byte dynamic random-access memories (RAM) and other advanced MOS products. In a contract signed last fall, the companies agreed to a 64K-byte dynamic RAM technical and manufacturing exchange.

* * *

Under a $4.5 million program sponsored by the the U.S. Agency for International Development, **Georgia Institute of Technology** is heading up a project to build a computerized network of information services for Egypt.

* * *

Ramteck Corp. has formed a marketing administration group to handle all administrative functions for the firm's realigned sales and marketing operations. Dan Burkhalter has joined the firm in the newly created position of manager, marketing administration, and Linda Kroening has been appointed manager, corporate communications.

* * *

GTE Information Services, Inc. will provide online stock market quotations and other financial information through its financial information network, Finet, to **ISFA Corp.**, Tampa, Fla., under a three-year, $10 million contract.

* * *

International Data Base Systems, Inc., manufacturer of the Seed data base management system, has changed its name to **Seed Software.**

* * *

Pansophic Systems, Inc. has acquired **Software Generation Technology Corp.'s** software product, SGT, a query and reporting system designed for use with IBM Corp.'s CICS.

* * *

Hazeltine Corp. has reached agreement in principle with two employee management groups and other private investors on the sale of both its computer terminal and graphics display terminal product lines. John Sasso, vice-president of computer terminal equipment for Hazeltine, will be president of the new company purchasing the computer terminal line, and Bruce Backe, president of Hazeltine's Imlac subsidiary, will head up the new firm purchasing the graphics display terminal line.

* * *

Nippon Electric Co., Ltd. (NEC) of Tokyo, and **Standard Microsystems Corp.** (SMC), of Hauppauge, N.Y., have signed an agreement providing for the worldwide, nonexclusive cross-licensing of each company's patents and patent applications relating to semiconductors and the transfer of technology required for SMC's becoming a second source for a number of NEC's microprocessor and microcomputer-related (MOS)/very large-scale integration circuit products.

* * *

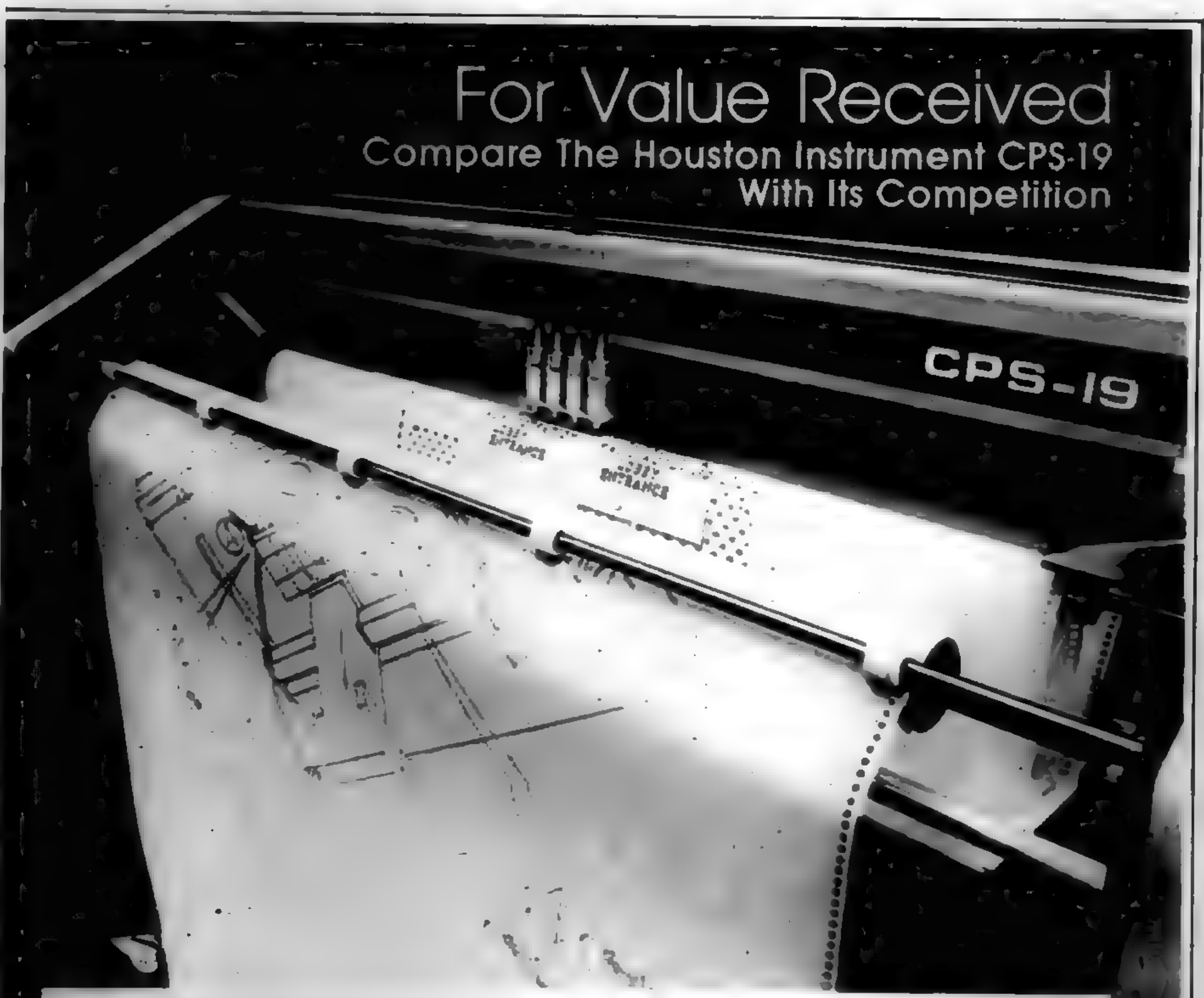
Prime Computer, Inc. is offering a 50% allowance to four-year colleges and universities on systems sales and upgrades, including most central systems, peripherals, software and all manuals. A 20% discount is available to all other nonprofit educational institutions.

* * *

IBM has expanded the marketing of its Personal Computer to include value-added sales organizations. IBM Entry Systems, Boca Raton, Fla., and the Distribution Channels unit in Rye Brook, N.Y., will be authorizing selected regional and national organizations to market the computer.

* * *

NCR Corp. has established a component evaluation and test center in Wichita, Kan. The center will receive and test semiconductor devices for use by all of NCR's engineering and manufacturing operations.



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POSITION ANNOUNCEMENTS

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Arizona

Senior Analyst — Banking Applications. Leading Arizona financial institution seeks a professional to assume full responsibility for project definition, planning, scheduling, resource management and final implementation. Excellent visibility to executive management. Position requires extensive banking knowledge, management skills and familiarity with large-scale IBM data base oriented systems. **To $33,000.**

Systems Analyst — System 38. Growing manufacturing firm in smaller Arizona community provides a ground-floor opportunity to build a staff and develop the data processing function. Proven leadership and technical skills including RPG II desired. Excellent opportunity. **To $28,000.**

Systems Analyst — New Corporate Subsidiary. Recently formed subsidiary of a prestigious Fortune 500 corporation seeks an Analyst to assist in the development of its first data processing systems. Position provides exposure to the corporate state-of-the-art data center, yet offers the benefits of a small, well-organized company. Solid background in COBOL, structured design techniques and previous system design responsibilities helpful. Phoenix location. **To $33,000.**

Minicomputer Systems Programmer. Phoenix based firm seeks an individual with extensive DEC PDP/11 software background to assume complete responsibility for system integrity, performance, generation and maintenance. Knowledge of minicomputers in a distributed processing environment preferred. **To $34,000.**

Data Base Analysts — Low Cost of Living. Growing organization in a stable industry seeks professionals to staff its newly created formal data base function. Two years experience with IMS, or other data base management system preferred. **To $37,000.**

Systems Engineer — Dual Career Path. Computer hardware vendor who ranks among the leaders in Distributed Data Communications seeks an Analyst to join its Phoenix office staff. Knowledge of several high level languages, data communications concepts and minicomputers is desired. Position offers exceptional growth opportunities in either technical or marketing ranks. **To $38,000.**

Consultants — High Technology. Small Phoenix firm is expanding its Consulting Group and seeks computing professionals with extensive IMS, CICS, Series 1 experience and familiarity with a wide variety of large and small systems applications sought. **To $46,000.**

Micro Systems Programmer. Prestigious computer hardware manufacturer seeks an experienced real-time Programmer/Analyst to participate in the development of applications for small aerospace industries. Extensive Assembler and PASCAL, engineering orientation and excellent oral/written communication skills required. Southern Arizona location. **To $36,000.**

Real-Time Programmer/Analyst — Graphics Software. Growth-oriented service firm seeks a professional to join its consulting staff, which provides software development for a wide variety of engineering firms. Position requires expertise in Assembler and PASCAL Language and previous experience in graphics or automated drafting systems. Moderate travel provided. Phoenix location. **To $34,000.**

Senior MVS Systems Programmer. Nationally known Phoenix organization offers challenging position with responsibility for MVS performance evaluation, hardware evaluation and planning, extensive TP network design and training of junior staff members. Obvious technical background sought, with preference for those with proven leadership abilities and a desire for future management responsibilities. **To $40,000.**

Operations Analyst — Distributed Processing. Phoenix area organization seeks a professional to analyze corporate operations to determine new operating center locations and develop techniques to enhance existing systems. Background should include business degree and operations management experience. **To $34,000.**

Engineering Analyst. High technology New Mexico-based firm seeks an Engineering Programmer with strong background in CAD/CAM (LSI), FORTRAN, minicomputers and graphics. Degree in Engineering preferred. Requires light travel and extensive interface with non-DP personnel. **To $34,000.**

RPG II Programmer — Learn COBOL, CICS. Northern Arizona organization seeks a professional with solid RPG programming skills to assist in financial and inventory development. Broad business applications exposure preferred. **To $25,000.**

Programmers — HP3000. Major Arizona organization is beginning the implementation of HP 3000-based distributed information systems. It offers outstanding internal training opportunities in a recession-proof industry. **To $25,000, M.I., M.S. degrees to $30,000.**

Minicomputer Specialists. Communications firm has multiple projects for mini/micro Programmers and Software Engineers to develop state-of-the-art communications based systems on microcomputers as front-end vehicles to handle line traffic and support multipurpose communications networks. **To $28,000, B.S. degree to $35,000.**

Systems Analyst — Distribution or Financial. Major division of a Fortune 500 corporation seeks an experienced Analyst with at least three years experience in distribution and/or financial information systems. Large systems environment exposure preferred. Arizona location. **To $34,000.**

ALC Programmer/Analyst. Corporate Data Communications Group of a Phoenix-based Fortune 500 company seeks an individual to participate in the development of sophisticated remote teleprocessing systems using VTAM, CICS, IMS/DC and IBM 3033's under MVS. Company offers extensive formal training in both technical and personal development areas. **To $33,000.**

MIS Director. Fast-growing diversified Phoenix company in the financial field seeks an individual to manage all data processing functions. Position reports directly to the CEO. **To $50,000 plus bonus and profit sharing.**

IMS Programmer/Analysts. Requires two years COBOL, IMS experience. Three new 1983 projects. **To $27,000, B.S. degree to $31,000.**

MRP Project Leader. Major Phoenix manufacturer requires expertise in MRP implementation. Four year project. Management growth. **To $42,000.**

IMS Project Leader. New IMS/DC development projects (one manufacturing, one financial). Lead 7-10 staff. Unique opportunity. **To $39,000.**

Programmer/Analyst — On-Line System Development. Growing Phoenix manufacturer seeks a professional to assist in the development and installation of a totally on-line manufacturing and financial control system. Communications systems provided. COBOL, IMS, and knowledge of MVS systems required. **To $33,000.**

Systems Manager — On-Line Development. Suburban Phoenix organization offers an exceptional opportunity for a professional with previous project management experience to direct the development of new on-line financial systems. Strong project control techniques and communication skills required. Prefer minicomputer experience. **To $34,000.**

New Mexico

Scientific Programmer. New Mexico mining firm seeks aggressive, technically-oriented individual with expertise in mathematical analysis and financial simulations. B.S. degree, DEC, VAX and FORTRAN experience sought. To $30,000, **M.S degree to $35,000.**

Junior Programmer/Analyst. Progressive New Mexico hospital offers an exceptional opportunity in the development of patient care and administrative systems. Will consider as little as six months experience. Prefer exposure to both COBOL and Assembler Language. **To $23,000.**

Systems Programmer. Leading New Mexico firm has created a new position requiring expertise in standards development, hardware/software evaluation and systems tuning, 370/OS/VS/VM. Excellent benefits. **To $32,000.**

Resident Systems Engineer — Minis. Leading minicomputer firm with major client in Albuquerque area seeks a Systems Engineer with strong Assembler and data communications language experience on mini systems. **To $35,000.**

Systems Programmer — CICS, VTAM. Major firm with large-scale mainframes offers a key position for a highly technical person having solid experience in CICS and VTAM (OS/MVS) internals. Albuquerque suburban location. **To $32,000.**

CICS Programmer/Analyst. New development in 1983 requires three new staff members. COBOL and one year CICS experience helpful. **To $26,000.**

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Miniprogrammer — Interactive Applications. International Denver-based corporation seeks a professional with three years experience in FORTRAN, PASCAL or PL/1 to work in interactive and graphics software development. Projects involve development of technical training and educational systems. **To $30,000.**

COBOL Programmer — Small Colorado Town. Stable manufacturing firm in low-cost-of-living area seeks IBM COBOL Programmers for on-line applications development. Excellent year-round climate; access to mountains. **To $27,000.**

BASIC Programmer. Minimum one year experience as Programmer/Analyst in BASIC, preferably in a small or medium scale hardware environment, qualifies you for a position in a growing manufacturing organization. Unique chance to move into a Senior Programmer position with systems responsibility. **To $25,000.**

COBOL Programmer — Burroughs. Exciting opportunity for a professional with three years COBOL experience. Situation is in a Burroughs medium systems environment and involves the development of new financial systems in a Colorado growth industry. **To $31,000.**

Systems Analyst — Banking. New electronic banking department of a large Denver bank is automating various manual systems and seeks a professional with bank operations knowledge and programming background to work with user departments. **To $30,000.**

Senior Programmer/Analyst — Medical Technology. High tech manufacturer of medical equipment seeks four year COBOL Programmer/Analyst with project management potential. Suburban Denver location. On-line Data Base applications. **To $38,000.**

Programmer/Analyst — Formal Training. International computer hardware manufacturer has multiple openings for Programmer/Analysts with a minimum of two years COBOL on IBM, OS or DEC environments. This Fortune 500 company has an excellent internal training program. **To $35,000.**

DDA Programmer/Analyst. Major Denver bank in the process of evaluating new banking packages seeks an individual with two years OS/COBOL background and DDA knowledge. Will modify existing programs or develop new DDA system. **To $28,000.**

Junior Consultant. National consulting firm seeks a degreed professional having a broad background in programming and analysis for its Denver staff. Advancement to Senior Consultant within two years. **To $27,000.**

Systems Manager. New Denver firm seeks a Manager preferably with some or all of the following: strong knowledge of commercial applications, project management, real-time data acquisition, and COBOL exposure. **To $35,000.**

Customer Applications Analyst — Time-sharing. Denver-based time-sharing firm is expanding its branch staff and seeks persons with two years of FORTRAN or BASIC exposure involving engineering or business applications. Dual career path leading to sales or technical support management. **To $28,000.**

Sales Representatives — Time-sharing. Highly-respected national computer services firm with well-established Colorado customer base seeks marketing professionals having at least one year experience in any DP sales activity. **Anticipated first year earnings to $40,000.**

Minicomputer Software Programmer — New Development. Two years Minicomputer Assembler qualifies you for a chance to be a part of a team involved in the development of operating systems and compilers. This Denver company is developing an advanced state-of-the-art super computer for scientific and engineering applications. **To $30,000.**

FORTRAN Programmer — Energy. Major oil company seeks minimum of two years FORTRAN programming experience. Oil and gas applications and PRIME exposure helpful. Excellent career growth potential. **To $32,000.**

Sales. International services firm seeks a seasoned data processing sales executive with a strong technical background and sales management experience. Position involves management of new sales staff in Denver. **To $45,000.**

Programmer/Analyst — International Travel. Software consulting firm with an international client base seeks a marketing-oriented Programmer with two years COBOL experience. Some travel provided as member of a support team. Denver location. **To $30,000.**

Programmer/Analyst — New IMS Development. Headquarters of a major division of an international firm moving into a new Denver data center seeks a professional with two years OS/COBOL experience. Knowledge of IMS preferred. Will be assigned to extensive new systems development projects. **To $29,000.**

Programmer/Analysts — Manufacturing. Multiple positions exist for Programmers having a minimum of two years COBOL or PL/1 experience for its expanding Denver suburban data center. Manufacturing applications experience and familiarity with RPG II highly desired. **To $30,000.**

Real-Time Programmer/Analyst. National software development consulting firm in beautiful Colorado Springs seeks a professional with solid FORTRAN experience combined with any Assembler real-time applications programming exposure, preferably on CDC hardware. **To $32,000.**

Utah

COBOL Programmer/Analyst — International Firm. Prestigious corporation with a worldwide customer base seeks an experienced DEC COBOL Programmer/Analyst. VAX or manufacturing experience is desirable. **To $30,000.**

RPG II Programmer/Analyst. High tech company based in Salt Lake seeks an experienced RPG II, HP3000 Programmer to assist with a conversion of manufacturing applications to an HP3000. **To $28,000.**

Programmer/Analyst — IMS. International financial firm with new data center in Salt Lake seeks professional with two years OS/COBOL plus IMS DB/DC. Offers full relocation package. Ground floor opportunity. **To $35,000.**

Software Engineer. Highly-respected, local firm located south of Salt Lake City seeks individuals experienced in compiler development or maintenance to become members of their compiler optimization staff. **To $44,000.**

CICS Systems Programmer. Stable and established Salt Lake organization is in need of a Systems Programmer to install and maintain CICS on Amdahl mainframe. **To $32,000.**

Data Base Analyst — VAX. New position for this high technology manufacturing firm. Two years COBOL on VAX utilizing DMBS under VMS sought. **To $30,000.**

EDP Auditor. Division of national oil company seeks EDP audit experience for position requiring international travel. French or Spanish fluency highly preferred. **To $40,000.**

Real-Time Programmer/Analysts. International, billion dollar firm plans to expand in total Utah workforce over the next year. It seeks professionals having FORTRAN programming experience involving real-time applications. **To $30,000.**

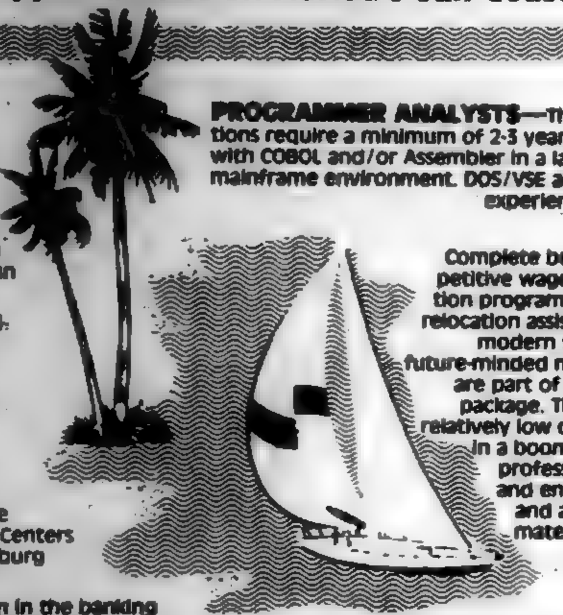
Systems Programmers. Fast growing division of an international company located in Salt Lake City seeks individuals with at least two years of large-scale IBM, MVS systems programming experience. On-line or data base experience preferred. **To $34,000.**

Senior Engineering Analyst. Leading firm in real-time process control and material handling systems seeks a degreed professional with one-to-six years of software experience on PDP-11/RSX 11-M or IBM Series-1. Excellent opportunity to use military or aerospace background and move to private industry. Salt Lake City location. **To $34,000.**

Systems Professionals

(Banking Environment)

Golden Opportunities on Florida's Gulf Coast...



At FLAGSHIP SERVICES CORPORATION, you'll get all the technical challenge, state-of-the-art environment, growth opportunity and freedom to innovate that you can handle.

A wholly owned subsidiary of FLAGSHIP BANKS, INC., we're keeping our organization at peak performance and profitability by providing new information processing solutions on an ever-changing banking scene in one of the finest DP Centers in the Tampa-St. Petersburg area.

Due to the deregulation in the banking industry and our own current expansion, we have the following positions available for professionals with various levels of experience:

SYSTEMS PROGRAMMERS—These positions require 4+ years experience in a VSE environment. Working knowledge of VTAM/NCP/MVS/CICS a plus.

PROGRAMMER ANALYSTS—These positions require a minimum of 2-3 years experience with COBOL and/or Assembler in a large IBM mainframe environment. DOS/VSE and OS/MVS experience required.

Complete benefits, competitive wage administration program, very liberal relocation assistance, ultra-modern facilities and future-minded management are part of the Flagship package. The rest are a relatively low cost of living in a booming market, professional sports and entertainment and a tropical climate on Florida's Gulf Coast.

For more information call collect to Debbie Courtney at (813) 885-8194 or send resume to: D. Courtney, Employment Specialist, P.O. Box 23300, Tampa, Florida 33623.

We are an Equal Opportunity Employer, M/F.

FLAGSHIP SERVICES
CORPORATION

YOU NEVER KNEW YOU COULD HAVE IT THIS GOOD!

DATA CENTER MANAGER

Haworth, Inc., a recognized leader in Office Interior Systems, has an immediate need for a key manager in our MIS Department.

The Manager of Systems Management, reporting to the Director of MIS, will be responsible for the maintenance and day-to-day operations of all implemented computer systems. The Manager will be responsible for the major areas of Computer Operations, Staff Analysis, Systems Support, Teleprocessing/Network Coordination and I/O Control. These will be accomplished by managing the activities of about 25 people through five direct reports.

Candidates for this position should possess a Bachelor's degree (or equivalent) with at least six years of job related experience in systems design and project leadership, preferably in a manufacturing environment. Some experience in a supervisory or managerial position is also required. Ideal qualifications would include the top position in data processing in a smaller company or a manager/senior supervisor in a larger company.

Haworth is located in the middle of the four season recreation area—swimming, boating, fishing, camping, snowmobiling, snowskiing—a beautiful area for families, sports and recreation.

This may be your opportunity to move up to a top quality company that is dedicated to the growth and development of its employees. HAWORTH, a dynamic, rapidly expanding organization, offers a complete fringe benefits package (including relocation) and ample opportunity for advancement. If you are interested in this position, please send your resume detailing salary expectations in complete confidence to:

Robert J. Pruim
Employment Manager

HAWORTH

One Haworth Center
Holland, MI 49423

An Equal Opportunity Employer M/F

EDP Fee Paid

BANKING

Position	Salary
Mgr. ATM - Statewide Network	$35-up
Sr. Systems Analyst - Hogan-Cash Mgmt.	$25-32K
Programmer/Analyst On-Line CICS/ATM-MVS	$20-30K
Programmer/Analyst Bank Card/MVS	$24-27K
Programmer/Analyst COBOL/OS-2 yrs.	$18-23K

INSURANCE

Systems Analyst 5/7 yrs. large scale IBM COBOL - IMS/VS CICS/VS	$26-34K
Programmer/Analyst 3/5 yrs. COBOL-OS-IMS CICS	$20-28K

MANUFACTURING

Senior Analyst OS/MVS COBOL - Mfg. apps.	$29-34K
Programmer/Analyst OS/MVS IMS/VS - Mfg. apps.	$25-32K

TECH. SUPPORT

Systems Programmer ASM-2-DASD	$32-39K
Systems Programmer OS/MVS-GENS	$30-38K
Systems programmer - VM GURU	$30-38K

These positions reflect a portion of the active openings that I am recruiting for LOCALLY, and STATEWIDE (I am also recruiting for similar openings in the southeast). Client companies assume all fees - including interviewing and relocation costs. Installations are "State of the Art" and offer defined career path progression. Forward your resume and/or call for appointment.

BILL DENNY
VICE PRESIDENT
JIM KING AND ASSOCIATES
1940 Gulf Life Tower
Jacksonville, FL 32207
904-396-7371

Gold Circle

DIRECTOR OF INFORMATION SYSTEMS

Today with 50 stores in 4 states and annual sales in excess of $600 million, Gold Circle, a leading division of Federated Department Stores, offers an outstanding career opportunity to the proven information systems professional.

Our organization has enjoyed phenomenal growth and expansion during one of the most difficult economic periods and the outlook for Gold Circle's continued progress is extremely bright. If you are seeking an extraordinary opportunity with excellent potential, we are the organization for you.

We are seeking a results-oriented professional to manage systems development, quality assurance and data administration in one of the most advanced, project-intensive M.I.S. departments in the midwest. The successful candidate will have the opportunity to direct an outstanding staff of energetic managers who are accustomed to following an aggressive, highly motivated, personally committed leader.

Requirements for this position include a degree in Business, Computer Science or other appropriate discipline. Also required, are 5-7 years of successful experience in managing numerous large development projects in a medium or large IBM main frame environment and knowledge of quality assurance standards. An MBA is preferred as is experience in IMS/CICS, ROSCOE, data administration management and a background in systems development tools. Prior exposure to the fast-paced retailing industry would prove very valuable.

An excellent salary and benefits package awaits you along with career opportunities second to none. Please send your resume and salary requirements, which are necessary to receive consideration, to:

Sr. Executive Placement Specialist
NAS REPLY SERVICE, Box 22B
50 W. Broad Street, Suite 1817
Columbus, Ohio 43215-3304

SYSTEMS ANALYSTS AND PROGRAMMERS FOR SUNBELT LOCATIONS

Job dissatisfaction, complacency, and frustration are the biggest obstacles to overcome to achieve one's career goals. Every day new career opportunities pass us by because we are unaware of their existence. Let us keep you abreast of what your true value is in the market place. Absolutely no obligations, please call or write Keith Ritchie, CPC, Data Processing Specialist.

Dunhill

Of CHARLOTTE, INC.
6401 Carmel Road, Suite 107
Charlotte, North Carolina 28211
800-438-2913
(NC Call)
(704) 542-6512

DIRECTOR OF DATA PROCESSING

Responsible for planning, development, and management of villages data processing operations. Degree in computer science or related field or equivalent experience and actual work in data processing. 3 to 5 years of progressively increasing responsibility in EDP management. Working knowledge of IBM system 34 and related software. Experience in system analysis. Salary range $30-36,000. Send resume to: **Personnel Officer, The Village of Schaumburg, 101 Schaumburg Court, Schaumburg, IL 60193.**

An Equal Opportunity Employer

MVS SYSTEMS PROGRAMMER

Cedars-Sinai Medical Center, the West's premiere medical center, seeks an experienced MVS Systems Programmer with in-depth knowledge of MVS/SP, JES2, CICS, ACF/VTAM/NCP, SMP4 and RACF. Must be capable of installation, tuning, and maintenance of MVS/SP and system components. Experience with operating system conversions and capacity analysis a definite plus. Salary is in the low to mid 40's, and supported by a superior benefits package including three weeks vacation the first year. Submit resume to:

Mr. John Gilbert, Employment
C S M C
8723 Alden Dr.
Los Angeles, Calif. 90048
(213) 855-5529

EMPLOYMENT SERVICE FOR PROGRAMMERS AND ANALYSTS

National Openings With Client Companies
and Through Affiliated Agencies

Scientific and commercial applications • Software development and systems programming • Telecommunications • Control systems • Computer engineering • Computer marketing and support

Call or send resume or rough notes of objectives, salary, location restrictions, education and experience (including computers, models, operating systems and languages) to either one of our locations. Our client companies pay all of our fees. We guide, you decide.

RSVP SERVICES, Dept. C
Suite 700, One Cherry Hill Mall
P.O. Box 5013
Cherry Hill, New Jersey 08034
(609) 667-4488

RSVP SERVICES, Dept. C
Suite 211, Dublin Hall
1777 Walton Road
Blue Bell, Penna. 19422
(215) 629-0595

RSVP SERVICES
Employment Agents for Computer Professionals

ROBERT HALF

EDP OPPORTUNITIES *COAST TO COAST*

Robert Half, staffed by EDP professionals for EDP professionals with 80 offices throughout the U.S., Canada & Great Britain, is the largest network of personnel consultants in the Data Processing field. And its establishment in 1948 also makes Robert Half the oldest. One call and you can search the local, national and international markets. All fees are paid by client companies, of course. The following is a partial listing of opportunities and locations:

BOSTON

IDMS TECH SUPPORT

Prestigious bus software devel seeks tech sharp sys specialist for new audit software releases. Must have strong BAL bkgrd + any DBMS a plus. Outstanding career catalyst oppty. **$33,000**

BANKING/BAL/COBOL

Progressive & dynamic comm'l bank seeks fast track MIS specialist for new banking sys projs. Lge IBM OS/MVS, IDMS mainframe shop w/prof staff. Oppty to gain valuable apps exp w/prestitious org. **$29,000**

CICS TECH SUPPORT

Well-known consumer goods mfr seeks tech astute support specialist. Will eval software tech, design, prog & tune networks & interface w/apps grp. State-of-the-art IBM shop w/ NCP & VTAM knowl a plus. Tech challenging pos w/ind ldr. **$32,000**

Garry Battista
ROBERT HALF
of Boston, Inc.
100 Summer Street
Boston, MA 02110
(617) 423-1200

PROVIDENCE

SYSTEMS PLANNER

Sys support in IBM DOS & OS install. Growth oriented co's req tech expertise to expand on-line data base environ. **$34,000**

ROBERT HALF
of Providence, Inc.
76 Westminster Street
Suite 400
Providence, RI 02903
(401) 274-8700

KANSAS CITY

TANDEM/TAL

Experience with Tandem opens this door to this high visibility opportunity. Work in a high tech interactive environment with exposure to top level management. One year of TAL required. **Salary to $35,000**

MVS SOFTWARE

Midwestern MVS shop seeks expansion to their staff. Position requires 1 year MVS support or two plus years OS/VS support with either TCAM or VTAM experience. This excellent firm offers liberal benefits, continuing technical education, and an exciting opportunity. **Salary to $37,000**

George Waterman
ROBERT HALF
of Kansas City
127 W. 10th St.
Kansas City, MO 64105
(816) 474-4583

HARTFORD

SYSTEMS PROG'S

CT clients seeking indiv's w/ IBM OS/MVS & CICS or DL/1 software exp. Blue Chip co offering full reloc expenses to fast track, promotable indiv's. **$50,000+**

DATA BASE

IMS DB/DC design & tech consulting bkgrd qualifies for corp staff pos leading to DB admin respons. Req 3+ yrs exp. **$35,000**

HONEYWELL

CT oppty's for lev 6, Data Base sys prog in multi-div/loc. Honeywell state-of-the-art client. Min 3 yrs exp qualifies for pos. **$35,000**

TELECOMM'S

Min 3 yrs network software exp w/ACF/VTAM, NCP, CICS internals. Knowl of network performance, debugging facilities desired for CT oppty. **$40,000**

Stan Durbas
Burt Israel
ROBERT HALF
of Hartford, Inc.
111 Pearl Street
Hartford, CT 06103
(203) 278-7170

CHICAGO

PROGRAMMER ANALYST

Excellent opportunity to join a leading consulting firm that will help develop your personal and professional career goals. Position requires at least 3 yrs experience PL1, minimum of 1 yr FOCUS & TSO. Following application areas would be considered: banking, human resources, property and casualty experience. Outstanding benefits package includes: dental, life and tuition reimbursement. **To $32,000**

Ed Byrnes
ROBERT HALF
of Chicago, Inc.
35 E. Wacker
Chicago, IL 60601
(312) 782-6930

MINNEAPOLIS ST. PAUL

PROJECT LEADER MRP
Wisconsin Vacationland

IBM 4300 type mfg environment. Our client needs individual to help tie in the various user plants with corp hdqtrs. Install a sophisticated on-line mfg system. Good communication, liaison skills important. **Salary to $32,500**

Mark David
Bill Thompson
ROBERT HALF
of Minnesota, Inc.
2236 IDS Center
Minneapolis, MN 55402
(612) 339-9001

SOUTHERN CALIFORNIA

LOS ANGELES

SYSTEMS PROGRAMMERS

Client firms have immediate needs for experienced Systems Programmers! Disciplines include MVS, IMS or CICS. Don't wait call or send resume today! **$30 to 50,000**

ROBERT HALF
of Los Angeles, Inc.
3600 Wilshire, #2000
Los Angeles, CA 90010
(213) 386-6805

ORANGE COUNTY

EDP AUDITORS

Immediate need for auditors with a Data Processing background. Large scale IBM experience desirable. **To $34,000**

ROBERT HALF
of Orange County
2333 N. Broadway, #200
Santa Ana, CA 92706
(714) 835-4103

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COBOL/DOS
LAW FIRM/4 WEEK VAC

Due to expansion, our client, a prestigious law firm, has a position for strong top-flight Prog/Analyst. Minimum 4+ yrs COBOL/DOS exper for ground floor developmental effort. New applications will be in CICS. Good analysis exper and superior communications skills essential. Highly visible. Fee Paid. **$36,000**

DEC/COBOL
DATA BASE

Prestitious educational institution is seeking to expand its financial systems group with the addition of a strong COBOL programmer/analyst. High visibility will afford a solid candidate excellent career growth. Interactive environment. Fee Paid. **$26,000**

DIRECTOR MIS
SYSTEM 38

Highly regarded New Jersey importer has a position for the first rate System 38 manager. Direct large staff & develop highly sophisticated systems. The successful candidate will possess a college degree & current exper in mgmt of Sys 38 installation. Visible position reporting to CEO. Long range DP plans are extremely impressive. Excellent benefits. Fee Paid. **$45,000**

ROBERT HALF
of New York
522 Fifth Avenue
New York, NY 10036
(212) 221-6500

DALLAS FORT WORTH

SR PROG/ANALYST

Seek individual w/min 5 yrs expr. Data point 6600 hardware/software bkgd required w/manufacturing & general business applications expr. Will install and support in-plant computer systems. Travel required. **$35-40,000**

SR SYSTEMS ANALYST

Large banking corp seeks person w/large scale IBM, COBOL & ITEM PROCESSING SYSTEMS bkgd. Excellent benefits in this dynamic growth environment. **To $35,000**

DATA BASE MANAGER

Large diversified conglomerant seeks individual w/large scale IBM, IMS, COBOL & ALC background. Must have min 2 yrs exp as DBA. Excellent benefits. Degree required. **To $40,000**

COMMUNICATIONS SYSTEMS PROGRAMMER

Nat'l prominant co w/new computer center in North Dallas seeks person to install, maintain, & support comm software. Must have min 3 yrs expr w/IMS /DC. Prefer ADF, VTAM, NCP, TCAM expr. **To $36,000**

Randy Habern
ROBERT HALF
of Dallas, Inc.
Two Northpark East, #750
Dallas, TX 75231
(214) 363-3300

DAYTON

"State-of-the-art" shop. Major mfg seeks growth oriented pro with IMS DB/DC. Will implement new systems. Exciting position! Fee Paid. **$22-30,000**

ROBERT HALF
of Dayton
First National Plaza
Dayton, OH 45402
(513) 224-0800

ST. LOUIS

EDP AUDITOR

Fortune 500 consumer products firm seeks an experienced data processing pro looking for a fast-track to management. Requires good communication skills, excellent analytical skills and experience with large scale IBM equipment. BS in Acct or DP preferred. **Salary to $35,000**

PROJECT MANAGER CONSULTANT

Prestigious national accounting firm seeks an experienced Project Manager with a heavy technical background. Must have heavy IBM background. Also requires BS in accounting or data processing. MBA a plus. Great benefits & bonus. **Salary $40,000**

MANAGER OF DATA PROCESSING

St Louis based manufacturer seeks an experienced NCR Sr Programmer Analyst to take on management duties. Must be familiar with VRX and IRX. Requires BS degree and 3-5 years experience. **Salary $30,000**

Randy Pace
ROBERT HALF
of St. Louis
7733 Forsyth
St. Louis, MO 63105
(314) 727-1535

FT. LAUDERDALE

IMS SPECIALIST

Multi-million dollar public corporation based in Ft Lauderdale is seeking a Data Base analyst with strong foundation in IMS/DL-1. Individual will design, develop and control corporate data bases. Fantastic fringes paid by the company, including interesting relocation package. Step up to this industry leader for challenge in an IBM state-of-the-arts environment and rapid upward mobility. **Salary to $33,000**

ROBERT HALF
of Fort Lauderdale
7770 W. Oakland Pk Blvd
Suite 410
Ft. Lauderdale, FL 33321
(305) 742-0200

NEW ORLEANS

SAUDI ARABIA

Sr P/A 3+ yrs COBOL IMS DB exp CICS DL/1 4341 OS/ VS1. Acctg & P/R appl. 1 yr in Orlando. 2 yr contract in Saudi Arabia with 50% inc in salary, no taxes. Relocation paid. **Salary Open**

BANKING GROUP MGR

S/A exp with ATM or HOGAN DDA system. Convert DOS/ VSE to OS/MVS. Not a System Programmer CICS & ALC are pluses. **To $50,000**

ROBERT HALF
of Louisiana, Inc.
P.O. Box 57629
New Orleans, LA 70157
(504) 835-4296

ALBUQUERQUE

SENIOR PROG/ANALYST

Excellent growth position with expanding New Mex co. Resp for implementing new financial applications. IBM large-scale, COBOL and CICS. **Start $30,000**

Dick Starnes
ROBERT HALF
of New Mexico
P.O. Box 3320
Albuquerque, NM 87190
(505) 884-4557

MIAMI

SOFTWARE PROGRAMMER

Subsidiary of national conglomerate has an open position for a systems programmer. UNIX, C Language is the key to this outstanding Florida opportunity. Major corp benefit package including relocation. Fee Paid. **Salary $35,000**

ROBERT HALF
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(305) 447-1757

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RPG

Growing metro area co seeks operations mgr. Solid IBM 34 programming skills required. Trading for IBM 38 and telecommunications. **$27,000**

ROBERT HALF
of Washington
7316 Wisconsin Ave.
Suite 401
Washington, DC 20014
(301) 652-1980

SAN FRANCISCO

Current needs are:
EDP Audit, IDMS Data Base, MVS Systems, Senior IMS DBA, IMS Internals, PL/1 Project Managers, CICS Command.

Patricia Brown
ROBERT HALF
of Northern California
111 Pine Street, 15th Floor
San Francisco, CA 94111
(415) 434-1900

SEATTLE

SR DATA BASE ANALYST

Progressive Seattle headquarters of national corporation seeks analyst with 7-10 yrs DP experience, including 4+ yrs experience with DL/1 in an IBM OS data base shop. Substantial data base design experience necessary. **Salary DOE**

Marjie Peterson
ROBERT HALF
of Seattle, Inc.
600 University Street
Suite 2326
Seattle, WA 98101
(206) 624-9000

SAN ANTONIO

FINANCIAL SYSTEMS ANALYST

Degree required. 2+ yrs COBOL, MSA Fin'l pkg exp a MUST. 43XX, OS/VS1 environment. Must have above average written & comm skills to interface DP. Excellent growth & salary potential. **$30,000**

IMS ANALYST PROJ LDR/MGR

Degree preferred – Any and all IMS personnel – salary is DOE. Excellent visibility, growth and future $ potential. Any bkgd. or appl environment. Co is stable & expanding, not replacing. **$30-50,000**

PROJECT MGR

Degree required. 7+ yrs DP with at least 2 yrs in project supv ldr, mgr role. Burroughs shop, HP3XXX interface in COBOL. Manage staff in newspaper circulation environment. Position is in Central TX and reports to top mgmt. Excellent benefits. **$40,000**

All positions above and many more are in Texas, where "Long Necks," "Armadillos" and the "Cotton Eyed Joe" call home.

Bob Baldauf
ROBERT HALF
of San Antonio, Inc.
8443 IH 10 West, Suite 860
San Antonio, TX 78201
1-800-531-5402
In TX Dial (512) 736-2467

AUSTIN

PROGRAMMERS, ANALYST, OPERATIONS

Challenging position w/ growing co in Austin if you have Tandem & COBOL exp. IMS+ Mfg +. **$OPEN**

PROGRAMMER ANALYST

Degree preferred. Exp w/ HP3000 & COBOL for min of 3 yrs. Sharp skills & good communication. **$30,000**

Tina J. Romans
ROBERT HALF
of Austin, Inc.
400 E. Anderson, #334
Austin, TX 78752
(512) 836-0883

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If you can read the above headline,
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Interested? Please send your confidential resume to:
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Employee Relations Department

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We are an equal opportunity employer

SOFTWARE PROFESSIONALS

TANO CORPORATION is committed to bringing creativity and ingenuity to its products which include the industry's most sophisticated marine and industrial supervisory control, energy management and data acquisition systems. Our continued expansion offers new opportunities to Software Professionals.

SUPERVISORS SOFTWARE SYSTEMS - hold direct line responsibility for project staff and products. Candidates must possess relevant degree and have five years real-time or systems software experience.

LEAD PROGRAMMERS - provide technical and administrative leadership to software projects. Candidates must possess relevant degree and three years experience with one of the following: real-time software, Motorola 680X, RSX11-M, or VAX, process control, or energy management.

DESIGN PROGRAMMERS - design, test and/or engineer software products and custom designed systems. Candidates must possess relevant degree and three years experience with one of the following: real-time software, Motorola 680X, RSX11-M, or VAX, process control, or energy management.

USER SERVICE/APPLICATION SUPPORT MGR - responsible for full applications support involving support analysis, scheduling and reporting, software maintenance and documentation, quality control and personnel management. Candidates must possess degree in computer science or have equivalent experience, plus minimum 2 years business application support/development experience.

DESIGN PROGRAMMERS/OPERATIONS - prepare system design and software specifications for new systems. Candidates must possess computer related degree, minimum 1 year experience with RSTS/E or VAX/VMS operating systems and BASIC + and/or BASIC II or VMS, VAX BASIC.

TANO CORPORATION offers an excellent compensation and benefit package, including 100% company paid medical insurance, incentive plan and pension trust. Please telephone to present qualifications or submit resume, in confidence, to:

(504) 254-3500
Personnel Recruitment Department

TANO
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Principals Only
Equal Opportunity Employer M/F/H

DATA PROCESSING PROFESSIONALS

STROEHMANN BROTHERS COMPANY, a recognized leader in the bakery industry, with multi-plant locations has immediate openings for qualified personnel within the information services group. Current environment includes medium, mini, and micro CPU's with large communication network. Main programming language is COBOL.

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DATA PROCESSING

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Resumes and supporting letters should be sent to: **Professor Laurence D. Hoffmann, Chair, W.M. Keck Professorship Search Committee, Claremont McKenna College, Pitzer Hall, Claremont, CA 91711.**

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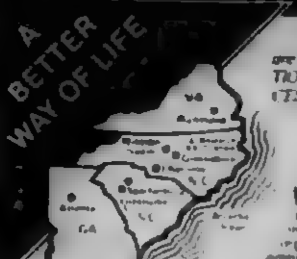

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GESCO, is a major computer service and software development company servicing the financial industry. We support an On-line Real-time communications network of over 6500 terminals on multiple IBM 3033's under MVS. Our client base has a combined asset base of over $22 billion. In the past 5 years, we have grown 5 times in size and we project a similar or greater growth over the next 5 years. Due to this dynamic expansion, we now seek a:

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Data Processing

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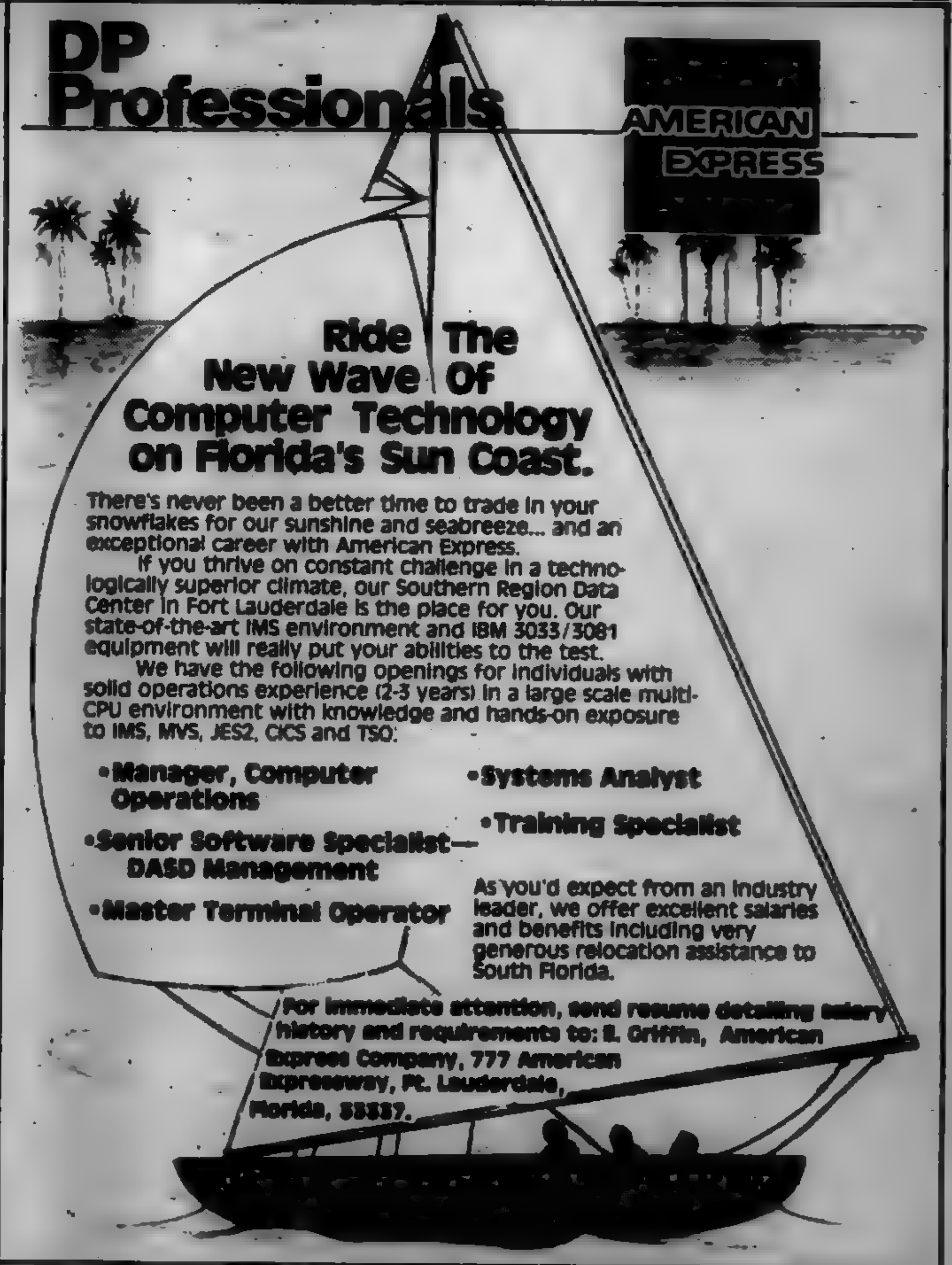

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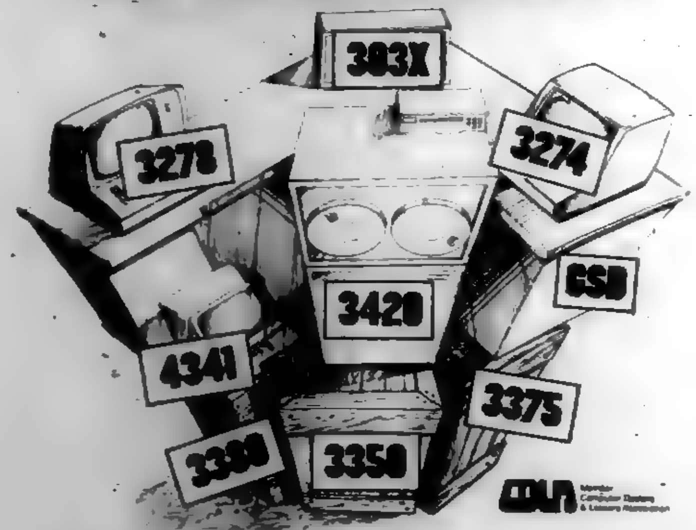

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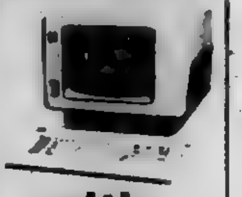

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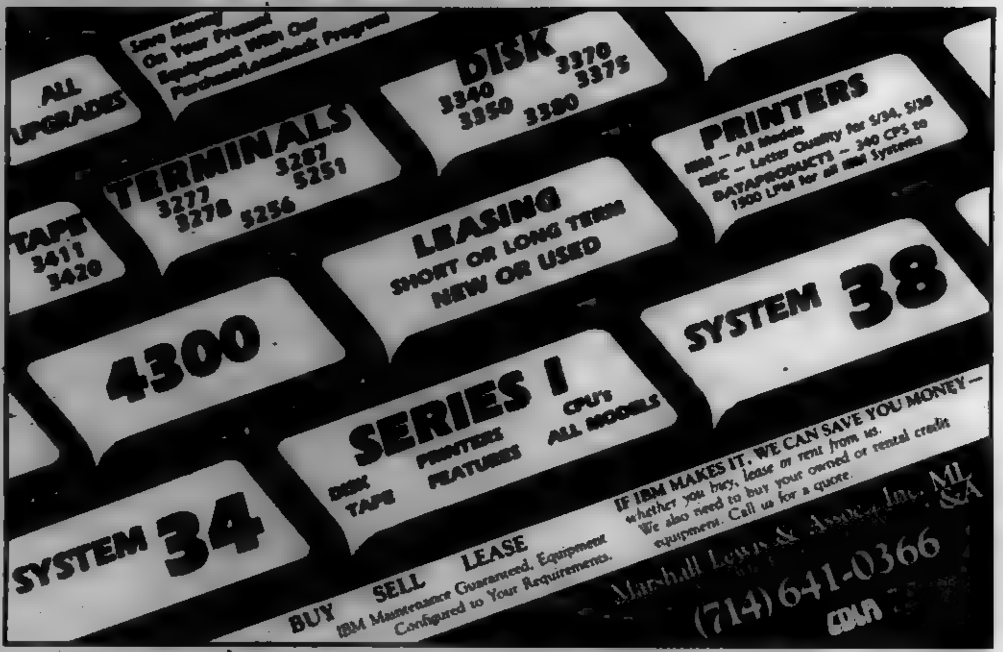

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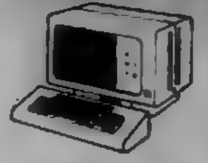

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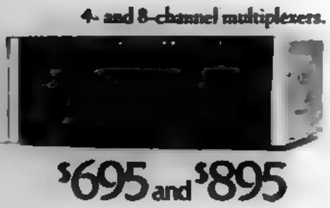

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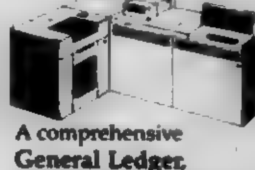

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CGA Computer Associates 55
Cincom Systems 24
Computer Corp. of America 53
Computer Management Research 29
Computerworld Buyer's Guide ID/8
Computerworld International Mktng. 66
Cord Cable Co. 21
CRWTH Computer Coursewares 51
Cullinet 54
CW on Communications 84
Dallas Market Center 10
Data General 56-57
Datapoint Corp. 64
Datasphere 46
Digital Equipment Corp.
—Large Computer 86-87
Digital Equipment Corp.
—Micro ID/30-ID/31
Digital Equipment Corp.
—Professional PC 22-23
Digital Equipment Corp.
—TPG 36
Elsevier Science Publishing 15
Fibronics 66
Gejac, Inc. 52
General Dynamics 44
General Research Corp. 50
General Systems 27
Henco Inc. 45
Houston Instruments 88
Hughes Aircraft ID/32
H&W Computer Systems 38
IBM 48-49,65
Independent Computer Systems 16
Infodata ID/34
Information Methods 72
Information Science Inc. 26-27
Infotron Systems 77
Inte-Com 72
Interface ID/9-ID/24
International Turnkey Systems, Inc. 20
Intersearch Corporation 64
IPL Systems 29
Jensen Tools, Inc. 78
J.W. Lampi, Inc. 26
Lee Data Corp. ID/4
Library Journal 68
Local Data 52
MacMillan Book Clubs 11
Management Science America 118
Master Data Utilities 19,88
MicroAge 28
Microterm 85
Miltron Associates 52
MPC ID/7
MTI Systems Corp. 68
Mike Murach & Associates, Inc. 9
National Advanced Systems 62-63
National Computer Communications 7
National Trade Products 76
Okidata 28
Omni Offices 49
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Protocol Computers 38,39,40,41
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Tesdata Corporation ID/33
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Whitesmith LTD 30
Wild Hare Computer Systems 15
Xerox Corporation 74
Yourdon 5

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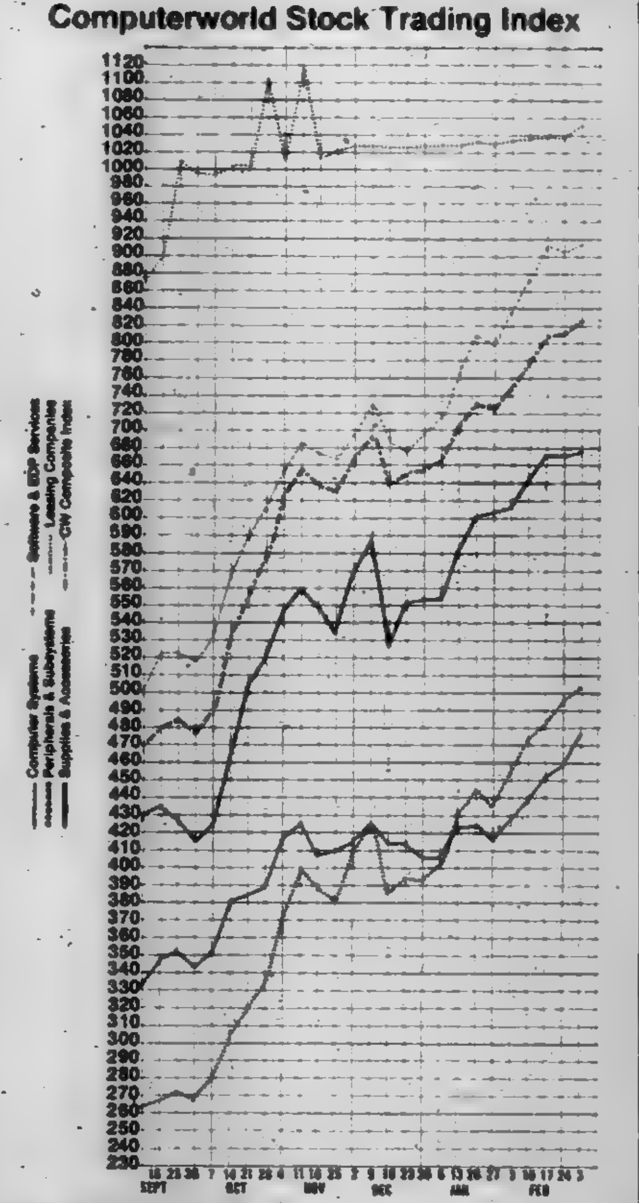

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, MARCH 2, 1983

All statistics compiled computed and formatted by TRADE QUOTES INC Cambridge Mass 02139

EXCH		1982-83 RANGE (1)	CLOSE MAR 2 1983	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
A	AMDAHL CORP	17- 46	40 7/8	+ 7/8	+2.1
N	BURROUGHS CORP	28- 48	47 3/8	+ 3/8	+1.3
O	COMPUTER AUTOMATION	7- 17	14 7/8	+ 1/2	+3.4
N	CONTROL DATA CORP	21- 51	49 3/4	+2 1/2	+5.2
N	CRAY RESEARCH INC	20- 48	44 3/4	+ 3/8	+0.8
N	DATA GENERAL CORP	20- 61	57	+2 1/4	+4.1
N	DATAPOINT CORP	11- 38	24	0	0.0
N	DIGITAL EQUIPMENT	62-128	124 1/4	- 1/4	-0.2
A	EECO INC	8- 12	11 3/4	+ 1/8	+1.0
N	ELECTRONIC ASSOC.	5- 12	9 5/8	0	0.0
N	FLOATING POINT SYST	18- 38	35	+ 3/8	+1.0
N	FOXBORO	22- 43	42 1/2	+1 1/8	+2.7
O	FULCRUM COMP GRP	1- 3	1/4	0	0.0
O	GENERAL AUTOMATION	3- 8	6 1/4	- 3/8	-6.0
N	HARRIS CORP	20- 54	40 1/4	-1 3/8	-3.2
N	HEWLETT-PACKARD CO	38- 87	85 7/8	+2 3/8	+3.1
N	HONEYWELL INC	60-104	98 1/8	+5 3/4	+6.2
N	IBM	57-102	102 1/8	+5	+5.1
O	IPL SYSTEMS INC	5- 11	10	- 3/4	-6.9
O	MAGNUSON COMP SYSTS	2- 5	3	- 1/8	-4.0
N	MANAGEMENT ASSIST	7- 18	16 1/8	-1	-5.8
O	MINI-COMPUTER SYST	1- 2	5/8	+ 1/8	+25.0
N	MODULAR COMPUTER SYS	8- 15	13 7/8	+ 1/8	+0.9
N	MOHAWK DATA SCI	10- 18	17 1/8	+ 1/2	+3.0
N	NCR	58-107	106 3/4	+3 1/2	+3.3
N	PERKIN-ELMER	17- 33	28 7/8	+ 5/8	+2.1
N	PRIME COMPUTER INC	16- 45	44 1/4	+1 1/2	+3.5
N	SPERRY CORP	21- 38	35 5/8	0	0.0
O	TANDEM COMPUTERS INC	14- 34	25 1/8	-2 7/8	-10.2
N	TEXAS INSTRUMENTS	71-178	155 1/2	-5 1/2	-3.4
A	WANG LABS "B"	13- 37	34 3/4	-1 3/4	-4.7
A	WANG LABS "C"	11- 37	34 7/8	-1 1/4	-3.4
	LEASING COMPANIES				
O	BOOTHE FINANCIAL CP	22- 34	33 3/4	+4 3/4	+16.3
N	COMDISCO INC	13- 52	51 7/8	+3 3/8	+6.9
B	COMMERCE GROUP CORP	1- 1	1/4	0	0.0
O	COMPUTER INVSTRS GRP	1- 2	1/2	+ 1/8	+33.3
O	CONTINENTAL INFO SYS	5- 21	18 3/4	0	0.0
N	DPF INC	5- 13	13 1/4	+ 7/8	+7.0
O	ITEL	1- 3	3/4	+ 1/8	+20.0
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	18- 41	38 5/8	+ 1/8	+0.3

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EXCH		1982-83 RANGE (1)	CLOSE MAR 2 1983	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 4	2 1/2	- 1/4	-9.1
O	ADVANCED SYSTEMS INC	8- 34	23 3/4	0	0.0
O	AGS COMPUTERS INC	7- 22	18 3/4	+ 1/2	+2.7
N	ANACOMP INC	8- 22	21 3/4	+1 1/4	+6.0
O	ANALYSTS INTL CORP	3- 9	8 3/4	0	0.0
A	APPLIED DATA RES.	18- 46	43 3/4	+3 1/2	+8.7
O	ASK COMPUTER SYSTEMS	12- 39	28 3/4	-2 3/4	-8.7
B	ASTRADYNE CORP IND	1- 5	4 5/8	0	0.0
N	AUTOMATIC DATA PROC	21- 38	37 1/4	+1 1/2	+4.1
B	CGA COMPUTER ASSOC	5- 14	13 3/4	+1 1/4	+10.0
O	COMPUTER ASSOC INT'L	12- 47	46 1/2	+1 1/4	+2.7
O	COMPUTER HORIZONS	2- 12	10	-1 3/4	-14.9
O	COMPUTER NETWORK	4- 10	9	- 1/4	-2.7
N	COMPUTER SCIENCES	11- 23	21 3/4	+1	+4.8
O	COMPUTER TASK GROUP	8- 18	16 1/4	+ 1/4	+1.5
O	COMPUTER USAGE	2- 17	15 1/4	0	0.0
O	COMPUTONE SYSTEMS	15- 38	33 1/4	+ 1/4	+0.7
O	CONSERV CORP	11- 20	18	+1	+5.8
O	CONSHARE	6- 12	12 3/8	+1 3/4	+16.4
N	CULLINET SOFTWARE	12- 38	31	+ 1/4	+0.8
O	CYCARE SYSTEMS INC	8- 18	15 3/4	+ 1/8	+0.8
O	DATA DIMENSIONS INC	1- 2	1/4	0	0.0
O	DATATAB	0- 2	3/4	0	0.0
O	DYATRON CORP	2- 4	3 3/4	- 1/8	-3.2
N	ELECTRONIC DATA SYST	15- 36	32 1/4	- 1/2	-1.5
N	INFORMATICS INC	10- 28	28 3/4	-1	-3.4
O	INSYTE CORP	1- 3	2	0	0.0
O	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	4- 8	7 3/4	- 1/4	-3.1
A	LOGICON	12- 34	32	+ 1/8	+0.4
O	MGMT SCI AMER INC	8- 28	25 1/2	+ 1/2	+2.0
O	MATHEMATICA INC	12- 22	20 1/2	+1	+5.1
O	MATHEMATICAL APP GRP	12- 22	21	- 1/2	-2.3
O	NATIONAL DATA CORP	5- 24	22 3/8	+ 1/2	+2.2
B	PANSOPHIC SYSTEMS	8- 29	24 1/2	- 1/2	-2.0
N	PLANNING RESEARCH	6- 15	14 7/8	+ 3/8	+2.5
O	PROGRAMMING & SYS	1- 4	3 3/8	- 1/4	-6.9
B	REYNOLDS & REYNOLD	17- 38	38 1/4	+ 1/4	+0.6
O	SEI CORP	11- 25	24	- 3/8	-1.5
O	SHARED MEDICAL SYST	13- 38	36 1/4	+5	+16.0
O	SCIENTIFIC COMPUTERS	8- 13	11 3/4	0	0.0
O	SOFTWARE AG	9- 17	10 3/4	- 1/8	-1.1
N	TYMSHARE INC	12- 30	24 7/8	+3 1/8	+14.3
A	URS CORP	5- 13	12 1/2	+1 3/4	+16.2
O	WYLY CORP	7- 13	10 7/8	+1 1/8	+11.5
	PERIPHERALS & SUBSYSTEMS				
P	AM INTERNATIONAL	2- 4	3 3/4	0	0.0
A	ANDERSON JACOBSON	8- 30	30	- 1/8	-0.4
O	AUTO-TROL TECHNOLOGY	8- 21	18 1/4	- 1/4	-1.3
O	BANCTEC INC	7- 32	17	0	0.0
A	BEEHIVE INT'L	4- 10	9 1/4	0	0.0
A	BOLT,BERANEK & NEW	12- 40	38 1/4	+ 1/4	+0.6
B	CAMBEX CORP	2- 4	2 1/4	0	0.0
N	CENTRONICS DATA CORP	6- 10	10	+1 3/8	+7.8
A	CETEC CORP	4- 8	7 3/4	+ 3/8	+5.0
O	COGNITRONICS	2- 12	10 7/8	+1 1/8	+11.5
B	COMPUTER CONSUM.	1- 2	1 3/8	0	0.0

EXCH		1982-83 RANGE (1)	CLOSE MAR 2 1983	WEEK NET CHNGE	WEEK PCT CHNGE
A	COMPUTER CONSOLES	19- 44	28	-2 1/2	-8.1
O	COMPUTER DEVICES INC	4- 21	13 3/8	+1 1/8	+7.8
O	COMPUTER TRANSCEIVER	4- 9	7 5/8	- 1/4	-3.1
N	COMPUTERVISION CORP	18- 49	41 3/8	-1	-2.3
N	CONRAC CORP	21- 38	32 1/4	-2 1/2	-7.1
A	DATA ACCESS SYSTEMS	1- 4	1 1/2	+ 3/8	+33.3
A	DATAPRODUCTS CORP	15- 41	38 1/4	-1 3/8	-3.4
A	DATARAM CORP	5- 12	10 1/4	-1	-8.8
O	DATUM INC	2- 10	8 7/8	+1 1/8	+12.0
O	DAVID JAMISON CARLYL	2- 7	4 3/4	+ 1/2	+11.7
O	DECISION DATA COMPUT	3- 14	12 3/4	- 1/2	-3.7
O	DELTA DATA SYSTEMS	1- 4	3 1/4	- 1/4	-7.1
N	ELECTRONIC M & M	5- 9	8 3/4	+ 1/2	+6.0
O	EVANS & SUTHERLAND	18- 50	43 1/4	-1 1/4	-2.8
O	GANDALF TECHNOLOGIES	10- 22	18 1/8	+ 3/8	+2.3
N	GEN'L DATA COMM IND	5- 18	18 1/8	+ 3/8	+2.1
O	GENERAL TERMINAL CP	0- 2	1	+ 3/8	+60.0
O	GREAT SOUTHWEST IND	2- 8	2 1/2	0	0.0
N	HAZELTINE CORP	22- 58	58 1/4	+5 3/8	+10.1
O	ICOT CORP	3- 10	7 3/4	- 7/8	-10.1
O	INFORMATION INTL INC	10- 22	18 1/8	- 1/2	-2.8
O	INTEL CORP	21- 47	45	+ 1/4	+0.5
O	IPL SYSTEMS INC	5- 11	10	- 3/4	-6.9
A	LUNDY ELECTRONICS	7- 18	14 1/2	- 3/4	-4.9
A	MSI DATA CORP	14- 38	19 3/4	-2 7/8	-12.7
O	NETWORK SYSTEMS CORP	15- 43	42	- 5/8	-1.4
O	OREX	3- 5	3 1/2	+ 1/2	+16.6
N	PARADYNE CORP	24- 51	46 1/8	-3 1/2	-7.0
A	PENRIL CORP	7- 12	11 1/2	+1 1/8	+10.8
O	RAMTEK CORP	12- 28	24 3/4	0	0.0
N	RECOGNITION EQUIP	4- 13	10 3/8	- 1/2	-4.4
O	SCAN DATA	1- 3	1 3/8	0	0.0
N	STORAGE TECHNOLOGY	18- 33	23 5/8	- 3/8	-1.5
O	SYKES DATATRONICS	8- 27	10 1/8	-4 1/2	-30.7
A	T BAR INC	7- 14	10 7/8	-2 1/8	-16.3
A	TEC INC	6- 12	9	- 1/4	-2.7
N	TEKTRONIX INC	34- 75	75	+2 1/2	+3.4
N	TELEX	9- 27	25	- 1/4	-0.9
O	TESDATA SYSTEMS CP	3- 10	8 3/4	- 3/8	-4.1
O	TIMEPLEX INC	7- 24	18 1/4	-1 3/4	-8.7
O	VISUAL TECHNOLOGY	8- 20	20	+1 1/2	+8.1
O	WILTEK INC	1- 3	2 5/8	+ 1/2	+23.5
	SUPPLIES & ACCESSORIES				
N	AMERICAN BUS PRODS	11- 21	21 3/8	+ 7/8	+4.2
O	BALTIMORE BUS FORMS	1- 2	1	0	0.0
N	BARRY WRIGHT	13- 25	23 1/2	+ 3/8	+1.6
O	CYBERMATICS INC	1- 1	1 3/8	+ 1/8	+10.0
A	DUPLEX PRODUCTS INC	12- 20	20 1/8	+1 3/8	+7.3
N	ENNIS BUS. FORMS	18- 30	28 1/4	+2	+7.6
N	3M COMPANY	48- 80	80 1/8	+4 3/8	+5.7
N	MOORE CORP LTD	28- 46	46	+1 3/4	+3.9
N	NASHUA CORP	8- 18	13 3/4	+2 5/8	+23.5
O	STANDARD REGISTER	32- [illegible]	[illegible] 1/2	+4	+7.8
A	TAB PRODUCTS CO	8- 23	22 7/8	+1 5/8	+7.6
N	WALLACE BUS FORMS	22- 36	35 1/4	+ 1/4	+0.7

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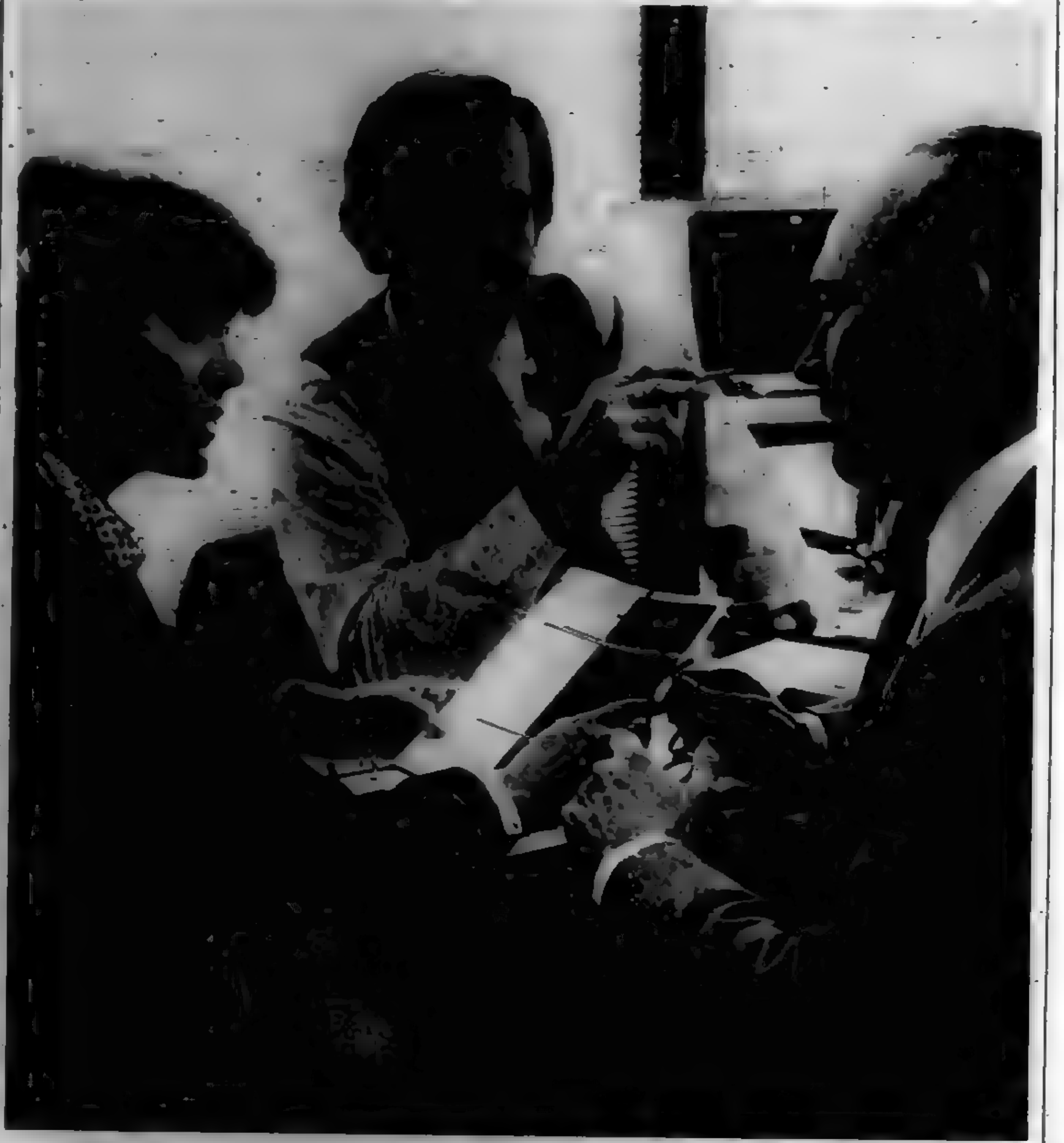

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Charlotte, NC	*March 17*
Chicago, IL	*March 2*
Cincinnati, OH	*April 19*
Columbia, SC	*April 26*
Dallas, TX	*March 10*
Dearborn, MI	*March 10*
Denver, CO	*April 21*
Des Moines, IA	*March 29*
Dublin, OH	*March 3*
Grand Rapids, MI	*April 28*
Houston, TX	*April 7*
Indianapolis, IN	*March 23*
Kansas City, MO	*March 15*
King of Prussia, PA	*March 10*
Little Rock, AR	*April 12*
Los Angeles, CA	*April 19*
Louisville, KY	*March 8*
Madison, WI	*April 14*
Memphis, TN	*March 22*
Milwaukee, WI	*February 24*
Minneapolis, MN	*March 22*
New Orleans, LA	*April 21*
New York, NY	*March 16*
Norfolk, VA	*March 1*
Oak Brook, IL	*April 26*
Oklahoma City, OK	*March 24*
Omaha, NE	*March 30*
Phoenix, AZ	*February 28*
Pittsburgh, PA	*April 7*
Portland, OR	*April 14*
Rochester, NY	*April 12*
St. Louis, MO	*March 8*
Salt Lake City, UT	*April 20*
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ne Rules anged ithholding

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Treasury Department has revised its rules for withholding of interest and dividend taxes by financial institutions, the controversial new tax law that has caused monumental headaches for the institutions' DP departments struggling to complete the necessary reprogramming.

Although most of the withholding provisions will go into effect July 1 as previously planned [CW, Jan. 10], the revisions will, among other things, push back the enforcement date six months for certain investment vehicles that are sold at discount, such as U.S. Treasury bills.

Moreover, year-end withholding — as opposed to monthly or more frequent withholding — will be allowed on money market deposit accounts and Super NOW accounts, as well as on savings and checking accounts.

Announcing the revisions March 2, Treasury Secretary Donald T. Regan reiterated the administration's commitment to the withholding provision, which will reportedly yield the government from $16 billion to $20 billion over the first five years, monies the administration argues would otherwise go unreported by individuals to the Internal Revenue Service.

The new regulations stem from the 1982 Tax Equity and Fiscal Re-

(Continued on Page 6)

Boasts 3.5 Times More Power

IBM Finally Unveils 3705 Successor

By Bruce Hoard
CW Staff

RYE BROOK, N.Y. — IBM last week brought out the long-awaited successor to its 3705 front-end processor, the 3725 communication controller, a device that claims twice the internal memory capacity and up to 3.5 times more processing power than its predecessor.

However, the 3725 will not replace but coexist with the 3705 for the near future, one analyst said last week. IBM does not want to upset the 3705 rental base, explained Dixon Doll, president of the DMW Group, Inc. and noted IBM watcher.

IBM is "keeping the price/performance differential modest so that it isn't going to be viewed as an announcement that will instantly obsolete the economic viability of 3705s that are on rental," Doll suggested.

Rumors that the 3705 would be supplanted by a 3725-like product have been rife for well over a year, he added. The 3705, whose current installed base is estimated at 40,000, was introduced in 1972, the 3705 Model-II was unveiled in 1976 and the 3705 Models 81, 82 and 83 in 1981.

The 3725 communication controller announced last week is available in two models which can be intermixed with 3705s in networks based on IBM 370, 30 series and 4300 series processors. The 3725 can coexist in Systems Network Architecture networks with 3705 controllers using current releases of the Advanced Communication Function/Network Control Program.

The 3725 Model 1 can carry data concurrently to six channels and 256 lines. The smaller 3725 Model 2, which can be upgraded to the Model 1, can transmit concurrently to two channels and 24 lines.

Both can be used as remote location controllers (link-attached). Lines and storage may be added without changing existing controller features, IBM claimed.

The 3725 consists of a central control unit with main storage of 512K bytes, 768K bytes or 1M byte for the Model 1 and 512K bytes for the Model 2.

The purchase price of a Model 1 with 1M byte of storage, four channel adapters, a 3276 expansion unit, console and 121 line interfaces (five high-speed, 116 medium-speed) is

(Continued on Page 4)

Second Personal Computer Focuses on Business Users

The XT Microcomputer Comes With a 10M-Byte Hard Disk.

By Ed Scannell
CW Staff

CAMBRIDGE, Mass. — IBM prepared to cut itself an even larger slice of the microcomputer pie last week when it unwrapped a sequel to its Personal Computer that features a 10M-byte hard disk and the optional capability of communicating with IBM mainframes.

The new microcomputer, christened the XT, costs $4,995 and is aimed at business users.

The company also announced that it is reducing prices on various configurations of its original Personal Computer by an average of 15%. For example, a 64K-byte configuration with a 160K-byte disk drive and printer now costs $2,908, down from $3,305. The same configuration minus the printer lists for $2,108.

The XT microcomputer is a 16-bit system. Equipped with an asynchronous communications adapter that makes it software-compatible with the Personal Computer, it can also be fitted with optional Synchronous Data Link Control and Binary Synchronous Communications adapters that reportedly permit the system to communicate with the company's entire line of mainframes.

Aside from the 10M-byte hard disk and asynchronous adapter, the XT's basic configuration consists of an Intel Corp. 8088 chip, 128K-byte random-access memory upgradable to 640K bytes, eight expansion slots (three of which are taken up by the

(Continued on Page 4)

Magnuson Files for Chapter 11

By Bill Laberis
CW Staff

After losing $57 million over the last two years, Magnuson Computer Systems, Inc. last week filed for protection under Chapter 11 of the Federal Bankruptcy Code.

Magnuson will continue to operate under court protection as it attempts to reorganize and pay its debts. Industry observers, meanwhile, are sorting through the evidence to assess whether the mainframer's collapse was the product of nearsighted management or the result of the intense competitive heat of an IBM-dominated marketplace.

By all indications, it was some of each negative force that sent the former Wall Street darling scurrying to protect its now-meager assets, valued at somewhere around $9 million. The possible demise of Magnuson as an independent company is causing analysts to assess the survival possibilities of the remaining members of the plug-compatible world, which has shrunk dramatically in the past two years.

For Magnuson, the handwriting was on the wall for nearly two years. The maker of IBM 4300-compatible machines blamed its bankruptcy fil-

(Continued on Page 8)

M80 Users Not Worried— Now

By Susan Blakeney
And Ed Scannell
CW Staff

While users of Magnuson Computer Systems, Inc. mainframes are concerned about getting spare parts and service for their systems over the long term, many are confident their short-term needs will be met adequately by the vendor and third-party service firms.

Because Magnuson is protected from its creditors under Chapter 11 of the Federal Bankruptcy Code, the vendor will be able to provide its customer base with service for the time being. Moreover, the company has set up third-party service arrangements in selected U.S. cities with Sorbus, Inc.

One DP manager said last week that he is not worried about Magnuson being under Chapter 11 "because

(Continued on Page 8)

Software Systems Programming Chiefs Found Highest Paid DP Managers in U.S.

By Paul Gillin
CW Staff

WILLOW GROVE, Pa. — Managers of software systems programming are the highest paid DP managers in North America, according to a recent salary survey of 20 DP positions conducted by the Administrative Management Society (AMS).

The "First Annual Systems and Processing Salaries Report," which covers 63,500 employees in 2,602 companies in 105 North American cities, reveals that systems programming managers earn an average of $36,100 in the U.S. and $38,700 (Canadian) in Canada. They are closely followed by applications programming managers, who are paid an average of $36,000 in the U.S. and $38,500 (Canadian) in Canada.

In the U.S., managers of computer operations earn the third highest salaries at $33,100, and data base administrators, lead programmer/analysts and senior software systems programmers also average over $30,000.

Low Data Entry Salaries

Data entry operators receive the lowest salaries, averaging $11,800 in the U.S. and $14,000 (Canadian) in Canada.

Other DP positions in Canada earning over $30,000 (Canadian) include data base administrators at $37,300 and lead and senior programmer/analysts and senior software systems programmers.

U.S. SOFTWARE SYSTEMS PROGRAMMING MANAGER

Type of Business	East	East Central	West Central	South	West
Manufacturing/Processing	$37,700	$37,400	$32,900	$37,500	$40,300
Banking/Insurance/Financial	$36,700	$35,900	$33,800	$35,300	$37,300
Retail/Wholesale Sales and Distribution	$35,500	$38,000	$36,300	$37,800	$34,700
Utilities	$43,300	$37,800	$38,000	$39,200	$40,300
DP Service Bureau	*	$37,300	*	$37,300	*
Government/Education/Employment/ Medical	*	$37,300	*	$37,300	*

* Not available due to small sample size.

Source: AMS

1982 Average by Region and Type of Business

An AMS spokeswoman said differences between the U.S. and Canadian figures are largely due to the strength of the U.S. dollar. The only major salary discrepancy between the U.S. and Canada is for operations managers, who average $24,900 in Canada, about $8,000 less than their U.S. counterparts.

By region, 14 of the 20 positions average the highest salaries in the Rocky Mountain states and westward. By industry, utilities pay best, leading in 19 positions, while the next highest salaries are paid by the manufacturing and processing sector.

The U.S. software systems programming manager working for a utility in the East averages $43,000, the survey reveals. Regionally, the lowest salaries are in the western Midwest.

Raises are most often awarded on merit, with 82% of the U.S. companies relying on that method. Less than 10% of the companies surveyed based raises on longevity, cost of living or equity.

General increases are awarded twice as much in Canada as in the U.S., with 48% of the Canadian companies surveyed using them for exempt employees.

The 44-page report also includes information on current personnel policies, recruiting practices and training and development programs for DP employees. Statistics are included on company policies on overtime, hours of work, unionization, job rotation and automatic progression. It costs $90 for non-AMS members, $60 for AMS members and is available from 2360 Maryland Road, Willow Grove, Pa. 19090.

This Week

IN DEPTH

Power Politics .... Follows Page 70
Software Copyrights ID/13
Team Planning ID/21

NEWS

Analysts See Shift in IBM Strategy 4
IBM Brings Out Additions for 3270 Line 5
N.H. Governor Trying to Abolish Central DP 6
Service as Usual, Magnuson Exec Promises 8
RPI, BU Announce Master's in MIS Programs 10
Schools Disturbed by Corporate-Faculty Ties 11
Communications Execs Offer Peep Into Future 12
Users Group Takes Initiative in Honing Package 13
MIS Managers Seen Training Replacements 14
Boston's Blackout Threatens DP Systems 16
Entrepreneur Working on 'Electronic Jury' 17
Users Systems' Stability Termed High Priority 18
N.J. Governor Seeks to Modernize System 19
MIS Groups Predicting Budget Growth 20
End-User Needs to Drive Software Mart: IDC 21
Desktops Predicted to Dominate OA Tech 22
House Passes Education Bill for Up to $1 Billion 23
Move Now on Policy Formation, NTIA Outlined 24
Census Bureau Urged to Consider Micros for '90 25
ICL Funding Program to Develop 'New' DPer 26
Managers on the Move 27
Turnaround Time 29
DPers Must Readjust Career Ideas: Exec 30
ICCP Names Top CDP Exam Scorers 31
Off the Press 33
Three-Person Staff Backs $21 Million Firm 35
Communications Package Helps Textile Firm 38
Almond Growers Find Time Ripe for WP System 40
Data Security Workshop Slated March 28 41

EDITORIAL

Editorial: Worth the Risk? 46
Softline: Singapore Vying for Software Center 47
The Data Center: Whether to Use Graphics 47
Human Connection: Handling Cyberphobiacs 48
Reader Commentary: Ready for DP Disaster? 49

SOFTWARE & SERVICES

Ask Questions Before Jumping Into T/S 57
'Statgraphics' APL-Based, Targets IBM 61
Aid Announced for IBM System/38 62
Utility Programs Offered for Burroughs Users 64
Mortgage Lenders Ask DP to Meet Demands 65
Bank Bucks Up Information Base With Package 69
Financial Modules Out for HP 3000 70

COMMUNICATIONS

Front-End Unit Targets IBM SNA Users 71
Multidrop Concentrator Supports 16 Dumb Units 72
Arm Beefs Up Data-Net 73
Color Graphics Terminals Out for Univac 1100 74
Enhancement Announced for RAV/Chips Module 75

SYSTEMS & PERIPHERALS

Business System Handles Accounting 79
Distributed Processing Nodes Out 80
Storage Subsystems Debut 81
Law Office Management, Info System Offered 84
Sturdy PDP-11-Based System Announced 85
Add-In Graphics Board Unveiled 86
Univac Delays Delivery of 1190 Series 87

OFFICE AUTOMATION

Board Connects DG Minis to Ethernet 91
Freeform DBMS Unveiled 93

COMPUTER INDUSTRY

Opinions Differ Sharply on IBM Lease Marketing 99
Reagan Seen Supporting R&D 99
Firms Join Forces to Develop Net Standard 100
Execs Lobbying for Rewrite of Export Act 103
Investment Venture Firm Off to Flying Start 105
M/A-Com Hiking R&D Outlays 107

ADVERTISING INDEX 140

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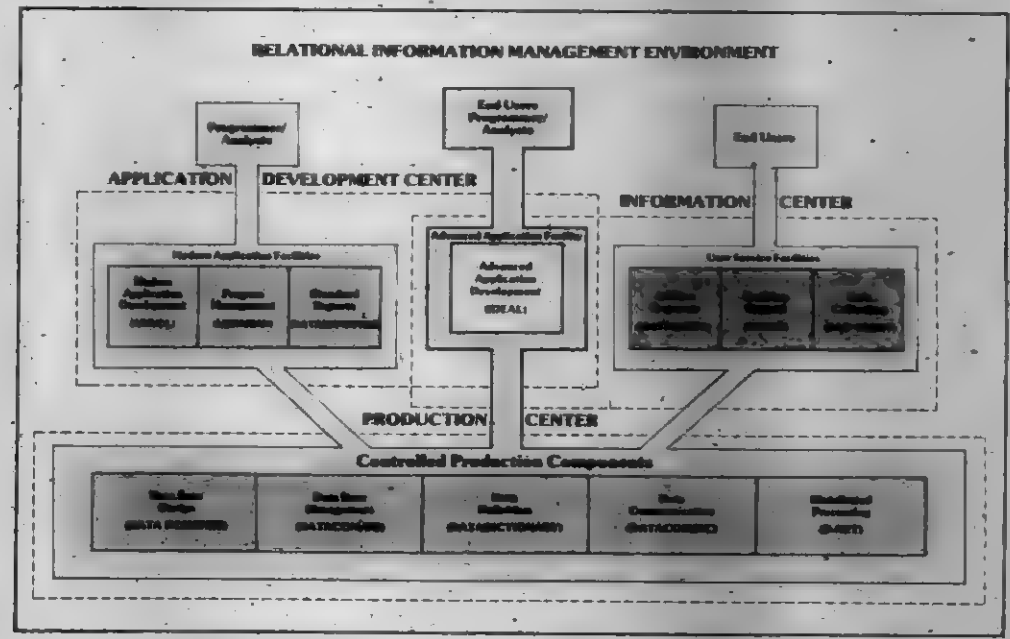
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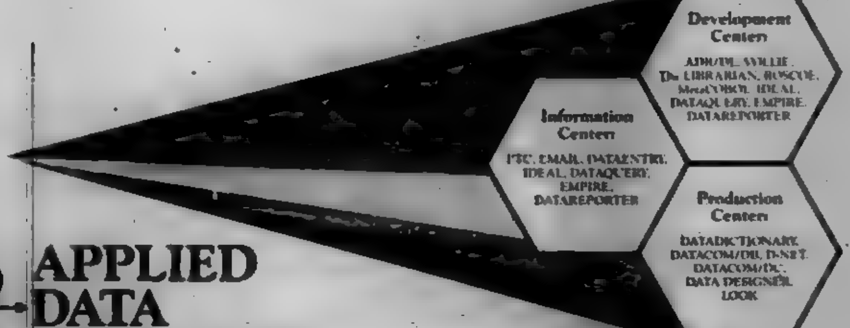
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(Continued from Page 1)

$299,940. The corresponding monthly rental fee is $13,155.

According to IBM, a comparable 3705 configuration would require two 3705 Model J4s, each with 512K bytes of storage, at a total cost of $349,090.

A Model 2 with 24 communications line interfaces, channel adapter and console costs $85,240 to purchase or $3,775/mo to rent. A comparable 3705 Model J1-based configuration would cost $102,035.

The optional 3726 expansion unit increases the total number of communications lines that can be attached to the Model 1 from 96 to 256, depending on the line speeds and traffic factors. The 3727 operator console is a keyboard and display unit used for installation and maintenance of the 3725.

The maintenance and operator subsystem includes a separate microprocessor, console attachment and a diskette drive for maintenance, record-keeping of machine configurations and logging of machine errors.

The transmission subsystem consists of line attachment bases with integrated communications scanners and line interface couplers. Five types of line interface couplers enable both models of the 3725 to use a variety of line speeds and transmission protocols. Line speeds include 19.2K bit/sec through an RS-232 interface. Protocols include all IBM 3270 models as well as the IBM 2741.

With the optional console switching unit, the primary console for the 3725 can be switched to any of up to four controllers. An alternate console is available and can be switched to any of six controllers.

The 3725 Model 1 will be available during the fourth quarter of 1983 and the Model 2 during the first quarter of 1984.

Software No Longer Free

RYE BROOK, N.Y. — IBM has begun charging for diagnostic software on its 3725 communications controller, which is available free on the 3705 communications controller.

The software, which has been slightly altered to fit the new controller, includes the Advanced Communication Function/Network Control Program (ACF/NCP), the Emulation Program (EP) and Advanced Communication Function/System Support Programs (ACF/SSP).

The cost for the software:

- The one-time fee for ACF/NCP is now $1,080. The monthly fee is $216.
- The one-time fee for EP is $1,200 and the monthly fee, $225.
- The one-time fee for ACF/SSP is now $420; the monthly fee is $76.

Second IBM Micro Targeted at Business Users

(Continued from Page 1)

asynchronous adapter, diskette and fixed disk adapters), a 5¼-in. dual-sided drive with a 368,640-char. capacity and a detached keyboard.

Available Options

Available options for the 16-bit system, in addition to the SDLC and BSC adapters, include a single-sided diskette drive with expansion unit attached, dual-sided diskette drive with expansion unit attached, game adapter, prototype card, user-installable and replaceable drives and memory and attachment cards, according to an IBM spokesman.

The most surprising feature about the XT, according to a number of IBM watchers contacted last week, is the system's price, which begins at $4,995.

"I think it shows that IBM can compete on a price basis, which is something a lot of people thought they couldn't do," said International Data Corp. analyst Aaron Goldberg.

"The price is very aggressive and right now comes close to being the price leader for that kind of configuration," echoed Egil Juliussen, co-founder of Future Computing, Inc. "Over the next month or so you will see a lot of price adjustments from IBM's competitors."

Juliussen also feels the XT will set a standard for those wanting to develop software for Winchester-based micros. "You could buy a Winchester for the [Personal Computer] before this but there were so many different ones and they all had different interfaces — you didn't know which was the right one to use. Now it is clear that you go with IBM's because you know there will be upgrades and software for it."

Major Competition

Several analysts feel the XT's major competition will be the hard disk versions of Apple Computer, Inc.'s Apple III, Radio Shack's Models 12 and 16 and Altos Computer Systems, Inc.'s series. While it won't be competing head to head with Apple's hard-disk-based Lisa workstation (due to different price points), International Resources Development, Inc. President Ken Bosomworth feels the XT will be a "diagonal competitor" and may undercut some of that system's market.

Other options introduced for the XT include:

- A 12M-byte memory expansion unit that allows the computer to store up to 22M bytes of data. It costs $2,695, or $3,390 when used with the Personal Computer.
- A 12½-in. high-resolution color display monitor capable of displaying 25 80-char. lines as well as graphics in 16 colors. The monitor is priced at $680.
- An enhanced version of its disk operating system (DOS 2.0) that contains a Basic interpreter. The system lists for $60.
- A word processing package from Peachtree Software, Inc. called Peachtext, which features a series of Help menus to aid in problem solving. List price for the package is $400.
- Additional versions (1.1) of Peachtree-developed business packages including general ledger, accounts receivable, accounts payable, inventory control and payroll. The 1.0 versions of these packages can be upgraded to 1.1 models for $120 per package through IBM product centers, the spokesman said.

The XT and its options are immediately available in all IBM product centers throughout the U.S. and Canada, a spokesman said. The system comes with a 90-day limited warranty, according to IBM. Further information is available from IBM's System Products Division, which can be reached through P.O. Box 1328, Boca Raton, Fla. 33432.

Analysts Say Introduction of XT Confirms Shift in Marketing Strategy

By Ed Scannell
CW Staff

IBM is making a major shift in its marketing and technological strategies, refocusing the lion's share of its attention on the lower end of its systems spectrum.

That is the theory of a number of analysts contacted last week after IBM's introduction of its XT Personal Computer and the announcement of its 3270 Personal Computer, which allows its mainframe-linked 3278 terminals to run the same programs as the IBM Personal Computer. This shift in strategy was attributed in part to the phenomenal success of the Personal Computer, which has forced the company to center its low-end strategy more around its microcomputer products and less around its 3270 series.

Proponents of this theory document their claim by pointing to the XT's asynchronous communications adapter and Synchronous Data Link Control protocol adapter, which permit it to communicate with IBM's complete line of mainframes. They claim the microcomputer line, once considered a technological outcast, is being brought closer to the IBM family.

Personal Computer Attaining Dominant Position

"The important change in IBM's plans, at least as we understood them six months ago, is that the [Personal Computer] line appears to be attaining a dominant position in their thinking vis-a-vis the 3270 line," asserted Kenneth Bosomworth, president of International Resources Development, Inc.

"The [Personal Computer] at one stage, as recently as a year ago, was perceived within IBM as an orphan product, a product that was out there on its own with an operating system that was not related to anything that was going on with any mainframe," Bosomworth noted. But with the new communications protocols, the microcomputer line is now becoming a "central element of [IBM's] whole network architecture strategy," the International Resources president said.

According to Bosomworth, IBM appears to have abandoned an ambitious program, code-named Rover, that was intended to upgrade the entire 3270 series. It was IBM's intention to lead its customers to its personal computers through the 3270 series, but the company now seems to be taking the opposite tack, Bosomworth said, describing last week's 3270 introductions as the "premature offspring of the Rover program."

He contends that IBM's purchasing 12% of Intel Corp. last October was an indication that the company is becoming more committed to its microcomputer line.

Aaron Goldberg, an analyst for International Data Corp., strongly disagreed with Bosomworth's contention that IBM is putting less emphasis on its 3270 terminals. The XT announcement did not represent "a shifting of IBM's strategy. This is providing the user with options," Goldberg said. "There are two different needs to be met. Both machines do different jobs better."

By fitting the XT with mainframe adapters and communications protocols, it is not getting special treatment among IBM's low-end systems, he maintained, pointing out that IBM has done the same thing for its Displaywriter, 5280 and 5520 systems.

Moreover, in a predominantly mainframe environment such as IBM's, a microcomputer has to run fast and efficient protocols, something microcomputers are simply not capable of doing, he added.

"The personal computers are intended to be used as a single-task, single-user computer that does local processing with application software. You can make it into a 3270, but that is not its natural mode. A 3270 is designed to be an on-line or time-sharing terminal communicating with a large mainframe," Goldberg explained.

IBM Brings Out Additions, Enhancements for 3270 Line

By Bruce Hoard
CW Staff

RYE BROOK, N.Y. — Last week's blitz of new products from IBM included the 3178 CRT terminal, which costs almost $1,000 less than the 3278 Model 2 and incorporates its most popular features. An attachment that lets the 3278 operate as an IBM Personal Computer was also announced. In addition, the vendor introduced four new models of the 3274 control unit, the Model 3299 terminal multiplexer and the Model 3290 gas panel display station.

The 3178 consists of a 1,920-char., 12-in., nonglare CRT screen that can swivel 90 degrees left or right; a lightweight, low-profile keyboard that can be adjusted to a 6- or 12-degree slope; and a logic element with a pedestal that serves as the unit's base.

The 3178 is said to be the first IBM product offered with a five-year maintenance option. Prices begin at $1,660, $988 less than the 3278 Model 2. The terminals will be available within 30 days.

The 3270 Personal Computer attachment allows a 3278 user to continue to utilize the capabilities of IBM's medium-size and large computers, as well as those of the Personal Computer. The operator can easily switch from interacting with applications in the central computer to working locally with Personal Computer functions.

Two-Component Attachment

The attachment consists of two components. The first is the 3278 Personal Computer adapter, which is installed at the customer location by an IBM service representative, and the second is the Personal Computer 3278 attachment option, which is installed by the user.

To use the two-component attachment feature, the system unit of the IBM Personal Computer is required. Three new system units ranging in price from $1,594 to $2,363 were also announced. If a user already has an IBM Personal Computer, he need only acquire the attachment feature — which costs $1,700 — and add it to the 3278.

The 3278 with adapter can communicate via the 3274/76 control unit to any host supporting 3278s. Adapter shipments begin in May.

The four new 3274 controllers are said to offer new price and performance and improved support for both local and dispersed networks handling different applications concurrently.

The following devices can be attached to the 3274s: Model 3178 and 3278 CRT terminals; Model 3279 color CRT terminals; the 3290 information panel; Model 3287, 3262 and 3268 printers; and the 3299 terminal multiplexer.

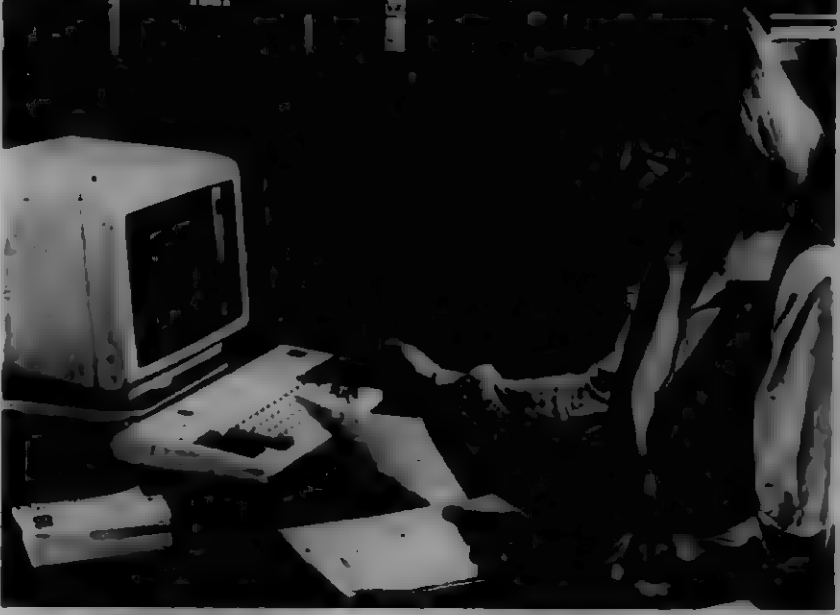
The controllers range in price from $7,600 to $18,230. They will rent for $382 to $946/mo. Two-year lease charges will be $326 to $806/mo.

The IBM 3299 terminal multiplexer can be connected to the 3274 controller via a single cable and supports up to eight terminals via shorter cables that fan out from the 3299 to each device. It also doubles to two miles the distance allowed between the control unit and the terminal.

The 3299 costs $1,175 and will be available within 30 days.

The IBM 3290 information panel uses a flat gas panel to display up to 9,920 characters of data on a distortion-free screen that is 10.7 by 13.4 inches. It attaches to IBM 370, 30 series and 4300 series computers and to the 8100 information system via a 3274 control unit.

The purchase price for the 3290 is $7,100 and the monthly rental fee is $315. A variety of maintenance agreements is offered.



The IBM 3178 is a compact, lightweight CRT terminal.

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Wants to Distribute Capabilities

N.H. Governor Trying to Abolish Central DP

By Jim Bartimo
CW Staff

CONCORD, N.H. — If newly elected Gov. John H. Sununu's fiscal 1984 budget is approved by the legislature, this state's DP staff will have a long, hot 60 days of summer to dismantle its DP facility — and then staffers may be out of work. The governor wants to distribute DP capabilities to individual state departments starting in July.

Depending on who is asked, the reasons cited for the breakup of the centralized DP facility range from budgetary to political (see story right).

The 105 employees of New Hampshire's Centralized Data Processing (CDP) organization are responsible for most of the state's financial data processing, including that of the Welfare Department, the Registry of Motor Vehicles and the state's equivalent of the Office of Management and Budget. But because CDP is an agency under the direction of a state commission, it can be written out of the budget with relative ease.

And "in the present budget, the line item for CDP is zero dollars," William Herman, the governor's press secretary, said last week. "The governor has made two initiatives, one to cut the budget and one to cut government bureaucracy."

Believing that CDP is part of that bureaucracy, the governor plans to allow the individual departments to run their own DP facilities. Hardware, personnel and autonomy will go to those departments that need it, and the remaining departments will latch onto the larger autonomous DP facilities.

Although Herman said "we want to distribute [the CDP resources] and fill in where it's needed," Director of CDP William Finch pointed out that 27 departments already have some DP equipment.

"Many people took advantage of the confusion over word processing and data processing," Finch said. "A lot of data processing machines came in with word processing coats on," according to Finch.

Finch argued that even if a reorganization is necessary, a 60-day period is too short a time for such a project. "If there's a plan," he said, "I'm not in on it right now."

There are other concerns for the DP chief, one of which is the lack of telecommunications among various departments. Herman said communications is unnecessary because departments with related activities will share the same DP facility.

But Finch said he believes that confusion will spring from a distributed environment with different types of equipment. "We provide communications facilities for all the departments," Finch said. "We use an IBM 4300 for communications. With all the communication that's going on now, you need a traffic cop."

Another concern is whether CDP staff members will be reassigned or fired if the budget is passed. "We're already picking up resignations from key people," Finch said. "High-tech people don't need this kind of trauma."

The governor's budget containing the CDP cut has met with favorable response from the legislature and could be approved as early as May 1, according to Herman. But a number of legislative processes are still to come, including testimony from CDP personnel.

Sununu is drawing on his experience in business to reorganize the system, Herman said. "The governor has been a consultant in business. He has contacted computer consultants, and they agree there should be a change."

The governor expects that cost justification for the retooling of an entire state's DP system will not come right away, but "in the long run, it will be a cost-saving measure," Herman said.

Whatever happens, Finch maintained, "I'm not fighting with the governor. I've shared my feelings with the governor and he has listened.

"My job is to work with the governor. If they decide what they want to do — we'll help them," he concluded.

Proposal Both Praised, Damned

CONCORD, N.H. — The move by newly elected Gov. Sununu to abolish the state's Centralized Data Processing (CDP) facility was both praised and damned by CDP users who would go on record last week.

Those who would not go on record, however, claimed that CDP is the victim of a movement launched by its end users.

According to sources, CDP had long been the target of resentment from its users. "For a number of years, there was a feeling that all the computer knowledge was held by the great gurus of CDP," said one state official. "And you'd have to pay them double what it would cost to do it yourself."

Another complaint was that CDP spends too much time on maintenance.

Although these feelings have abated somewhat in the 18 months since CDP Director William Finch took over, another user said that the movement to dethrone CDP started with a recent independent consultant's study. "The consultant asked all of the user departments what they thought of CDP, and they were all critical," the state official said. "If some of those departments knew what would be proposed to replace it, they wouldn't have been so harsh."

One Satisfied User

One user who went on record praised CDP and Finch, blaming other departments' unhappiness on their inability to deal with a service organization. "I, for one, am happy with CDP," declared Charles L. Connor, deputy legislative budget assistant in the Division of Budget and Fiscal Support for the N.H. legislature. "If you're going to work with an agency such as CDP, you have to know what you want and be willing to work with them."

Connor is somewhat fearful of what decentralization will bring to his department, which is "New Hampshire's version of the [federal] Office of Management and Budget and the Government Accounting Office," Connor said. "My department has no technical staff to program or analyze any of that stuff. We know we want reports but we don't want to do it ourselves."

In contrast, the Department of Safety, which handles the state police and the registry of motor vehicles, welcomes an autonomous DP arrangement. With five major files on different systems, "we're all over the place," Mitchell Call, DP project manager, said. "We have a tremendous amount of file redundancy. We have to integrate the files into a data base management system, and CDP can't handle that for us."

B2900 Gets Upgrade Path As Burroughs Adds B2925

DETROIT — Burroughs Corp. provided its B2900 users with an upgrade path last week by adding an entry-level mid-range system the company claims is 1.3 times faster than its predecessor, the B2800, and takes up 60% less space.

Dubbed the B2925, the system's CPU holds a minimum of 1M byte and a maximum of 2M bytes of memory. It is software-compatible with all of Burroughs B2000, B3000 and B4000 mid-range processors, a Burroughs spokesman said.

The basic system consists of an I/O processor, an integrated console subsystem and up to eight data link processors, according to the Burroughs spokesman.

The system can be upgraded to have up to 16 data link processors by adding a second data link processor base, the spokesman said. The system's data communications capabilities can also be enhanced by incorporating the vendor's B3680 communications processor, which accommodates up to four host computers and 288 data communications lines.

Another option for the system is the Shared System Processor, which is part of the I/O subsystem and permits multiple host systems to share common data files, the spokesman maintained.

Software available for the system includes an enhanced version of the vendor's MCP operating system. It also includes language compilers, a data base management system and several application programs and online programming aids, according to the spokesman.

Finally, Burroughs has also reportedly "engineered" a new diagnostic circuitry, firmware and software into its B2925. The new diagnostics allow users to run tests even when the system is down. Previously, diagnostics could only be run on Burroughs systems while they were operating. As a result, an integral maintenance processor monitors the status of the processor, memory data link processors and I/O processors, the spokesman said.

Prices for the system start at $145,000. One-year lease prices begin at $6,287/mo with three- and five-year plans also available.

First shipments are expected to be made during the first quarter of this year. The firm is headquartered at 1 Burroughs Place, Detroit, Mich. 48232.

Withholding Rules Revised

(Continued from Page 1)

sponsibility Act. Elderly and poor taxpayers will be exempt, but most others will have 10% withheld from interest and dividend payments from financial institutions.

Implementation of the 1982 tax act's "withholding at the source" provision had been delayed once before, but banks and other financial institutions claim that the withholding changes eventually will cost millions of dollars for reprogramming and for new bookkeeping requirements.

A massive lobbying campaign orchestrated by the institutions and their trade associations has resulted in more than a million cards and letters from depositors to their Congressional representatives.

Legislation to repeal the withholding provision has overwhelming support of the majority in both houses of Congress. However, congressional leaders and the White House strongly oppose repeal, leaving the outlook for such bills uncertain at this time.

Treasury's Regan said the withholding revisions announced early this month respond to the legitimate complaints of financial institutions that responded to a request for public comment on the new tax law. The various revisions are designed to relieve the institutions from "undue hardships" that might have resulted from implementing the withholding tax this summer.

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THE BAD OLD DAYS: Most of the VM Backups now in use are low-level programs, to put it charitably. (Subterranean might be a better word.) They simply use too many machine resources. And they require too much manual assistance from the operations staff.

As a result, much of the Backup, Recovery and Copying done in the nation's VM centers is just plain lousy. It's often done haphazardly...sporadically...or not at all. Heaven only knows how much this has cost in terms of destroyed data, incomplete records, and damaged reputations.

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Magnuson Files for Chapter 11 Protection

(Continued from Page 1)

ing in part on the steep 4300 price cuts that IBM made last October.

But analysts feel the die had been cast long before. "The company got pigeonholed in a market that just didn't grow as extensively or as fast as people first thought," said Dale Kutnick, director of research at The Yankee Group in Boston.

Kutnick said selling 4300-compatible mainframes is a very expensive, time-consuming proposition, mainly because users are often reluctant to leave the IBM fold to save "maybe $30,000 or $40,000, which is all they'd save on a small plug-compatible mainframe."

In addition, management shortcomings at Magnuson resulted in its becoming largely a one-product firm, Kutnick indicated.

"They tried to expand all at once with no real sense of direction," Kutnick continued. "They lost a lot of credibility about two years ago, especially when Carl Amdahl [former executive vice-president] left. They were just too thin all around."

Another theory is that Magnuson missed its marketing chance. "Fundamentally, I think [Magnuson] missed the window they had when they first came out with the product. They had a lead on IBM of 18 to 24 months, depending on who's counting the months, and when they ran into trouble a couple of years ago and had to suspend their development activity they lost their window," said Joe Oddo, staff vice-president of Automatic Data Processing, Inc. (ADP) of Clifton, N.J., Magnuson's biggest user.

"If you look at the 4300 family of products — and the breadth of horsepower it covers — you wonder where [Magnuson's] niche could possibly be," he added.

Jack Hart, industry analyst at International Data Corp. in Framingham, Mass., indicated that Magnuson's management can be directly blamed for the company's downfall and IBM only indirectly. The firm's management, Hart said, "should have known they were getting into an IBM world — there was no excuse for going in blind."

Hart said that plug-compatible vendors benefited for several years from IBM's nonaggressive price structure, which allowed IBM's competitors to undercut the industry giant by 10% or more and still profit.

Since the dismissal of the U.S. vs. IBM antitrust suit, however, IBM has announced a series of strategic price cuts that has ravaged its plug-compatible competitors. As Hart put it, "The [plug-compatible manufacturers] were cozy beneath the IBM price umbrella, which now is collapsing all around them."

Hart, too, noted that Magnuson's problems began at least a year before IBM initiated its more aggressive pricing policies. In 1981, the company began experiencing extensive field problems with its M80 line of processors, problems that required extensive reworking in the field. It was in March of 1981 that Carl Amdahl left Magnuson's research and development team. Magnuson also scrapped a costly Cmos development effort that year when plans for an R&D development effort in that technology fell through.

By the end of that year, Magnuson was reporting a $36 million loss on revenues of only $27 million.

Merger Partner Search Begins

Company fortunes continued to slide in 1982 and the search for a merger or acquisition partner began. A likely candidate emerged in Storage Technology Corp., but unsettling news about Magnuson's debt killed the deal. Magnuson President Joseph Hitt resigned under pressure and the firm initiated the first of several layoffs.

Finally, last November, a group of private investors purchased a controlling interest in Magnuson. But the dam had already burst. Magnuson finished 1982 losing $21.6 million and began 1983 by announcing it was scrapping development plans for its next line of processors.

In a prepared statement issued last week, Magnuson President Charles Strauch said merger talks had been started with two companies but declined to name them.

Speculation is that any one of the large, IBM-based service bureaus could be interested in buying Magnuson, perhaps to supply their customers with small mainframes to perform distributed data processing. One such company mentioned is ADP, which uses more than 90 M80s.

A spokesman for ADP, however, said the company has no plans whatsoever to buy Magnuson. Most of ADP's machines are leased, he noted.

The Yankee Group's Kutnick said the purchase price of Magnuson at this time would be in the $20 million to $30 million range. "If there's anything really left there to acquire, it would be an interesting and cheap acquisition," he added.

Meanwhile, analyst Bill Easterbrook of Kidder, Peabody & Co.'s Technology Research Group in New York is skeptical that Magnuson will survive Chapter 11.

"Chapter 11 is a serious thing. If I owned a Magnuson system, I would certainly want to find someone to take care of it two to three years down the pike," Easterbrook said.

Users Not Worried — Now

(Continued from Page 1)

over the past 3½ years the company has proved they have good equipment." Dick McTague of United Farm Real Estate in Kansas City, Mo., said that "this indicates to me there are companies that would recognize the value of the customer base and the equipment and would be more than willing to assume [Magnuson's maintenance responsibilities]." McTague's firm owns the first M80/43 installed in Kansas City.

The biggest concerns for Lee Fitzpatrick, director of hardware and communications at Computer Sciences Corp. (CSC) in Los Angeles, are the availability of spare parts for his Magnuson shop and the small number of service companies available for his equipment. "My personal feeling is that there is enough expertise in the country so I don't think we'll have a problem," he said.

CSC has six Magnuson machines — three M80/31s and one each of the M80/30, M80/42 and M80/43. Fitzpatrick's only fear is that parts and service costs for his equipment will escalate if Magnuson goes under.

Magnuson's largest user, Automatic Data Processing, Inc. (ADP) of Clifton, N.J., has been making contingency plans since the vendor filed under Chapter 11. "We have put procedures in place to cover ourselves," confided Joe Oddo, staff vice-president at ADP. "We have relationships with a number of companies that make us feel confident we can get the level of support we need, at least for the intermediate period.

"Longer term — if they can't pull out of it — it's hard to imagine continued viable use of the equipment." All of ADP's Magnuson equipment, which includes 30 Magnuson-made machines as well as 60 other IBM-compatible mainframes, is leased, so Oddo is not worried about losing a major investment if the vendor folds.

Were Magnuson's users surprised at the vendor's Chapter 11 filing? Most of those contacted last week admitted they had sniffed trouble long before the March 8 announcement.

"If you have followed the history over the past year, you well know they have been having financial problems . . . their quarterly earnings have not been good, so there were indications that it was inevitable that this was going to happen," McTague said.

Oddo concurred: "When you work closely with a vendor and observe his progress on a monthly basis . . . you begin to ascertain where he is headed before he announces anything. It has been common knowledge they have been in trouble for a long time."

"I think we all knew it was coming sooner or later," Fitzpatrick added. "If somebody didn't buy them out, [we knew] they would end up in this situation. It still doesn't mean someone won't pick up the pieces."

It Will Be Service as Usual, Magnuson Exec Promises

By Robert Batt
CW West Coast Bureau

SAN JOSE, Calif. — Users of Magnuson Computer Systems, Inc. processors can expect service as usual during the company's Chapter 11 bankruptcy proceedings, its vice-president of operations has promised.

Interviewed here last week, Robert Stephens voiced optimism about the company's chances of surviving Chapter 11: "The company can definitely survive, based on customer confidence and our ability to continue with support services. Our job is to honor our contractual obligations to our customers, and this we intend to do."

Stephens' optimistic assessment of Magnuson's situation is, he explained, based on the fact that users have remained loyal to Magnuson over the past year despite the company's financial troubles. Customers have had plenty of opportunity to switch to equipment from IBM or to other plug-compatible manufacturers' equipment, he argued, but have not done so.

In fact, Stephens claimed, the number of users in the past year rose to over 300.

Stephens, the Magnuson executive who has been chiefly responsible for renegotiating the company's outstanding debt, said the company will focus in the immediate future on financial restructuring, building new business relationships and diversifying.

"We are being very realistic about the immediate future," he said. "For the moment, we are focusing on the next 90 days, and we intend to base our plans on short-term increments . . . We do not see Chapter 11 as a desperate move. Rather, it is a thoughtful business response to the situation."

Stephens agreed the company could have filed for court protection under the bankruptcy code earlier. However, Magnuson wanted to do everything it could to avoid that step.

"The risk in filing for Chapter 11 protection is that there will be a loss of customer or employee confidence or that we are unable to reorganize successfully while under the protection of the court. The advantage, on the other hand, is that we can gain control over our destiny.

"The problems we are facing are manageable," he asserted.

Prompted by IBM

Stephens reiterated the claim made by Magnuson Chief Executive Charles Strauch that IBM's recent market aggressiveness coupled with a shareholder class action against the company claiming nondisclosure of financial information had prompted the latest action.

Stephens admitted that the suit, which the company claimed is unfounded, had been a major barrier to obtaining substantive relationships with other companies. It diluted the company's energies, which needed to be focused on financial viability and, competition with IBM, he said.

Moreover, legal costs have been high, and "to compete with IBM, you need to have money." While Magnuson has restructured $7 million of its debt to major creditors since November, it is left with $6.8 million of unsecured debt.

Over the past four months, Stephens said, Magnuson pursued the possibility of building OEM relationships, diversifying into areas outside of the mid-size mainframe market and marketing DP products for other companies. "All these turned out to be an exercise in frustration," he reported.

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Program Differences Reflect Issues

RPI, BU Announce Master's in MIS Programs

By Lois Paul
CW Staff

In the midst of the continuing clamor for and controversy about master's degree programs in management information systems (MIS), two schools recently announced that they are beginning M.S./MIS programs.

In June, 20 students will enter Rensselaer Polytechnic Institute's (RPI) Management of Technology for Technical Professionals program. And in September, Boston University (BU) will admit the first 40 students to its M.S./MIS program.

But there are differences in the curricula and targeted student bodies for these two programs, and these differences highlight some of the issues involved in the whole area of graduate MIS education. Among them is the issue of whether to emphasize the more technical aspects of computer science or stress the management issues that usually are more typical of an MBA program.

Another issue is whether to concentrate on training students with business backgrounds in technical subject areas or whether to provide technically oriented students with an understanding of business.

BU is trying to position its program in the middle, with a slight leaning toward management. The 12-course program, which can be completed in three full-time semesters, is "aimed at applying information systems to manage business problems," and entrants are required to possess an undergraduate degree in business, according to Associate Dean Michael E. Lawson.

The program's three levels of courses will include an applications area consisting of a review of major MIS applications, a technical core designed to provide both practical skills and a theoretical framework and elective MIS courses intended to provide additional depth in important aspects of the technology.

CW Photo by P. [illegible]

BU's program is 'aimed at applying information systems to manage business problems,' said Associate Dean Michael E. Lawson.

Initially, the program will accept 40 full-time students. Lawson said it is deliberately being kept small because of the difficulty of finding MIS professors. However, BU already has seven or eight full-time faculty members for the program and is actively recruiting additional faculty.

While BU's program is geared toward launching business undergraduates into careers as MIS managers, RPI's program is intended to help technically oriented people who are approaching the management level obtain the business training they need to make this leap.

"Most of the successful engineers in the sciences obviously assume managerial positions," Robert J. Allio, dean of the School of Management at RPI, said. "Very few of them, in the process of assuming the managerial role, had any formal preparation."

RPI's program requires eight weeks of full-time classes for three summers. Between summer sessions, the students will work under the direction of faculty members to apply to particular corporate issues what they have learned during the past semester.

"If you take a year off from your job, you might as well forget going back to that position or a related position. There is just no way of maintaining the continuity within the corporation for a 12-month or even a six-month period," Allio said.

The BU program also includes an internship program during which students will spend 10 hours a week working in groups of four at local corporations to help them design and implement information systems.

Students Urged To Compare MIS Programs

How does a prospective student distinguish among the variety of graduate management information systems (MIS) programs that are springing up in increasing numbers?

Every program is slightly different, noted Lynn DeNoia, assistant professor and coordinator of the M.S. in Computer Information Systems (CIS) program at Bentley College in Waltham, Mass.

"The key for me between Boston University and Bentley, for example, is that [Boston University's] graduate program is an MIS program and ours is CIS. And although we tend to try to focus on producing people who are appropriate liaisons between management and technical types, they really are going to focus much more on the management side."

The University of Minnesota established an M.S. in MIS program in 1968. "We took the tack that there is a need for a person who can span management and the information systems area," explained Gordon Davis, Honeywell professor of management information systems at the school. He noted that the program has been broadened so that its graduates receive an MBA as part of it.

Davis compared the University of Minnesota's program to Boston University's, but noted that the latter "strips away some of the things that you might expect in an MBA program to keep it short. They are saying that you have an undergraduate business degree. On top of that we will put MIS."

There are similar programs at New York University, University of California at Los Angeles, Northwestern and University of Arizona at Tuscon, and these types of programs, Davis said, "provide that mixture of the technical and the organizational and management so a person can design information systems to suit organizational purposes and implement them and manage them."

Certain technical areas, such as programming and development methodologies, are better learned on the job, he said, so long as the concepts are understood via the graduate program.

Directory, Survey Offer MIS Program Info

There are a number of graduate management information systems (MIS) programs, but few centralized sources of comparative information about them. However, the University of Minnesota last December released the "MIS Research Center/McGraw Hill 1983 Directory of Management Information Systems and Faculty," which lists 135 schools offering MIS programs in the U.S. and Canada and their faculty members.

Of the 135, about 100 are offering MIS programs on the graduate level, according to Gordon Davis, Honeywell professor of management information systems at the University of Minnesota.

Copies of the directory can be obtained for $10 from the University of Minnesota MIS Research Center, 269 19th Ave. S., University of Minnesota, Minneapolis, Minn. 55455.

Gordon himself participated in an earlier effort to survey the number of schools offering MIS programs. The survey was conducted in 1979 by the Association for Computing Machinery (ACM), and its results were published in the March 1981 *Communications of the ACM*.

Jay Nunamaker, head of the MIS department of the University of Arizona in Tuscon, Ariz., and chairman of the curriculum committee on information systems for ACM, explained the workings of the survey: "People sent in information on their curriculum and we sorted through it to see if it met some minimal set of guidelines from ACM. The criteria was that it had to have five courses that dealt in the area of programming systems, data and file structures, systems analysis and design. If there was some set of five courses that roughly fell in those categories, plus four courses that address the functional areas in business, then that was the minimal set that we were looking for."

Of the 70 programs identified at the bachelor's level, 53 satisfied this minimal set of criteria. At the master's level, 54 programs were identified and 34 satisfied the ACM guidelines.

ACM has not updated its survey. Gordon speculated that there may be 20% more graduate MIS programs to date that meet the ACM's criteria.

Further information on the ACM survey can be obtained from the Education Board of the Association for Computing Machinery, 11 W. 42nd St., New York, N.Y. 10036.

Beware of Weak Programs, Prof Warns

A word of caution for prospective graduate management information systems (MIS) students was issued by J. Daniel Couger, professor of computer and management science at the University of Colorado's College of Business and Administration in Colorado Springs, Colo.

While Couger thinks "all the market trends point to the fact that we are not nearly meeting the demand . . . there are some terrible programs out there," he warned last week. "There are some programs that offer a couple or three courses and call it an MIS program, as opposed to trying to implement the [Association for Computing Machinery (ACM)] curriculum."

Couger alluded to a weakness in the background of students with strong computer science education but no business courses and few humanities. They do very well in programming, he said, but after two years they hit the top of their level, not knowing enough about the business aspects to qualify to be systems analysts. "Nor have they had the managerial courses to qualify them to lead a division," he added.

Alternatively, students in schools of business that have very weak quantitative requirements "graduate having systems courses and managerial courses, but are not able to work at all with complicated systems," Couger said, noting that they would not be capable of working with complex applications like a data base.

Couger, who worked on the ACM's curriculum guidelines for graduate MIS programs, also expressed concern about the potential increase in graduate MIS programs without the accompanying qualified faculty members. There are 18 teaching positions for each Ph.D. candidate in MIS, he said, and many schools are attempting to start graduate MIS programs with one or two faculty members and an overreliance on part-time faculty.

Schools Disturbed by Corporate-Faculty Ties

By Tom Henkel
CW Staff

Several universities are concerned that faculty members — particularly those involved with computer science, electrical engineering and bioengineering — are establishing such strong ties with corporations that they can no longer objectively function as university researchers.

Universities are also concerned that professors are letting their corporate consulting work interfere with their teaching duties. In addition, some university officials question whether faculty members are misusing university resources (particularly computer systems and graduate students) to carry on research for corporations.

The University of California system has instituted 20 different policies during the past five years to govern the types of dealings that faculty members can have with outside organizations. The latest one is a state-mandated program that requires faculty leaders of nongovernment-supported research projects to disclose any financial ties with the sponsor of that project.

Nongovernment research projects are sponsored by companies in the private sector, as well as foundations and public agencies like the American Cancer Society, American Heart Association and American Lung Association, which receive funds from corporations.

Suspect Integrity

Some professors receive pay for their research, but there are also other financial ties with corporations. For example, a faculty member can serve on a corporation's board of directors, be a corporate officer or own a large amount of stock in a particular company. In the eyes of many universities, this type of involvement makes the integrity of research done under the sponsorship of a corporation somewhat suspect.

According to Afton E. Crooks, conflict of interest specialist for the university system, as of the end of January, 126 project leaders out of 1,210 (about 10.4%) had direct financial ties with the sponsors of the nongovernment-funded research projects they headed. Crooks said the university system's board of regents has yet to determine how many of those project leaders are involved in electronics research.

"We're not sure whether that [number] is high or not," Crooks said, noting that only in the past six months has the university required project leaders to tell whether they had dealings with sponsors of their research projects.

"We're thinking about this whole field very deeply," Crooks said. Aside from the state-mandated project dislosure program, the university system requires all its faculty members to tell the university when they are doing consulting or other research work outside the university. Currently, faculty members are required to tell the university the name of the firm and offer a description of the work they are doing. At this point, however, the university does not require faculty members to disclose how much they are being paid for their services.

Traditional Watchdog

Traditionally, Crooks said, it has been the job of department heads to keep an eye on professors and determine whether they are spending too much time on outside interests.

The disclosure requirement has received a mixed reaction from faculty members, Crooks said. Some contend that the requirement is a violation of their privacy. Others feel the requirement will preserve the integrity of the university.

"The policy is a big pain," said one faculty member who does financial consulting. "You just have to fill out more forms. I tend just to ignore them."

University officials generally agree that faculty involvement with corporations is not necessarily evil. Prof. Clement Markert, chairman of a Yale University committee that recently recommended that faculty members be required to file disclosure forms, noted that consulting work and corporate research helps keep faculty members abreast of current developments in their respective fields. That corporate involvement becomes a problem when faculty members spend too much of their time working on outside projects.

At MIT, where a majority of the computer science, electrical and bioengineering faculty members have ties with at least one corporation, the university requires that virtually all corporate-sponsored projects have public results. Sponsors of most MIT research projects:

- Must permit the findings of the research to be made public and be available for publication.
- Must give MIT sole possession of any patents or copyrights to products that may result from a research project.
- Must allow MIT to retain the freedom to issue rights to any patents or copyrights to the corporate sector on a nonexclusive basis.

An MIT spokesman said that while there have been some occasional exceptions to that 100-year-old policy, faculty members who fail to comply generally face immediate dismissal. However, MIT is slightly more flexible on the types of corporate positions its faculty members can hold. For example, some faculty members have served as directors of corporations, provided that position does not detract from the faculty members' teaching responsibilities.

Pittsburgh's Carnegie-Mellon University (CMU) is very dependent on corporate-funded research, noted its provost for science and engineering, Dr. Daniel Berg.

According to Berg, CMU ranks third highest among technical schools doing corporate-sponsored research.

However, the school has yet to develop a formal policy on conflicts of interest. Berg heads up a faculty committee that hopes to develop a conflict of interest policy sometime this spring.

"We are a relatively small and open place," Berg noted, adding that CMU's size makes it difficult for faculty members to keep secrets.

In Palo Alto, Calif., Stanford University requires faculty members to disclose corporate connections on request if there is some question of conflict of interest. In addition, the university routinely surveys faculty members on their corporate affiliations.

A Stanford spokesman said that while the university is aware that more faculty members are doing corporate work, there are no immediate plans to alter university policy.

CW Illustration by T. Monahan

Reagan Endorses High-Tech Enterprise

SAN FRANCISCO — President Reagan took time during his recent trip to the West Coast to deliver a ringing endorsement of free trade principles and to reiterate his newfound admiration for U.S. high-technology industries.

In a March 4 address here, Reagan strongly denounced what he called "those faint hearts who have little faith in American enterprise and ingenuity" and praised the entrepreneurial spirit of the high-tech industries located in nearby Silicon Valley.

Reagan singled out Daisy Systems Corp. of Sunnyvale, Calif. The 2½-year-old maker of computer-aided design systems increased its revenues from $7 million the first year to a projected $25 million in 1983, with 1986 revenues expected to reach $300 million, Reagan noted. Exporting to seven foreign nations, the firm has quadrupled its work force in the last year, the president said.

Reagan discussed his administration's efforts "to retain America's technological edge" by, among other things, supporting research and development tax credits and increasing federal support for basic R&D.

"For too long," Reagan said, "the government has treated the entrepreneur more as an enemy than an ally. Our administration has a better idea. We'll give you less bureaucracy if you give America your audacity."

The president briefly outlined his administration's three-point plan for supporting U.S. industrial competitiveness in world markets. The plan calls for laying "a firm foundation for noninflationary growth"; working with U.S. industry to enhance its competitiveness, especially through negotiated reduction of international trade barriers; and helping "international financial and trade institutions to strengthen world growth and bolster the forces of freedom and democracy."

The U.S., Reagan said, "will stand up for principles of trade expansion through freer markets and greater competition among nations . . . [and] carry the banner for free trade and responsible financial systems."

Communications Execs Offer Peep Into Future

By Phil Hirsch
CW Washington Bureau

BALTIMORE — Predictions about forthcoming data communications technology were the order of the day at a financial analysts' conference convened here last week by Alex Brown & Sons.

MCI Communications Corp.'s Bill McGowan said that MCI is now installing a modulation system that will allow twice as many bits to be transmitted per unit of time through its backbone microwave network. The first commercial use of the quadrature amplitude modulation system is scheduled for this fall between New York and Chicago, a company spokesman added.

The MCI chairman also reported that beginning in September 1984, customers of the divested Bell operating companies who want to route their long-distance calls over other common carrier facilities will be able to do so either by telling the Bell operating companies ahead of time — and thus having all calls automatically transported to the other common carriers' local switch — or by entering a four-digit code as part of the call setup process. Customers who want to use AT&T's Long Lines Division will also have to employ these procedures, he said.

At the same meeting, John Tyson, president of Compression Labs, Inc. in San Jose, Calif., said that a significant improvement in video teleconferencing technology is imminent. The coding/decoding equipment commercially available today compresses a standard 90M bit/sec full-motion digital TV signal into a 1.5M bit/sec code; the new technology will further reduce the number of bits required while improving the quality of the picture. Since the cost of video teleconferencing is directly related to the number of bits transmitted, this development should reduce costs to the end user, he added.

Joseph R. Leonardi, president of CXC Corp. in San Jose used the meeting as a forum to announce that his firm has just signed a marketing agreement with Centel Corp., a major independent telephone carrier, under which Centel will market the CXC "Rose" system, a voice and data private branch exchange (PBX) that includes local-area network capabilities.

The Centel-CXC agreement comes at a time when telephone carriers are being widely criticized for failing to satisfy user demands for sophisticated data transmission services. One indication is the growing interest in "bypass" services able to go around the local-exchange network. Another is a recent Federal Communications Commission study, based partly on interviews with several private and public sector organizations. It reported that "many large users complained about problems with [telephone-company-provided] high-speed data facilities and [network] management tools."

The prediction that IBM is going to announce a local-area network product this year came from Ralph Ungermann, president of Ungermann-Bass, Inc., Santa Clara, Calif. Ungermann, whose company is a major manufacturer of local-area networks, also said, "We're not going to see the seven layers of the [International Standards Organization] reference model standardized in our lifetime" — a reference to the long-term effort to develop a complete set of communications protocols permitting universal interconnection among diverse terminating devices.

They're Trying New Ilk of CRT

GAINESVILLE, Fla. — An experimental display technology similar to LEDs but using less power may eventually be used to develop CRT terminals that emit a minimal amount of radiation.

The technology uses a combination of tungsten and oxygen which, when charged, produces a blue glow. Unlike currently used LEDs, the tungsten-oxygen combination does not require a constant flow of electricity to remain illuminated, and it can be seen from virtually any angle.

The last image produced on the tungsten-oxygen display remains visible without maintained power until a reverse current is applied, according to Sey Shing, a graduate research assistant at the University of Florida. Shing is working on the project with Prof. Paul Holloway.

Currently, the tungsten-oxygen displays are being developed for use in calculators and digital watches. The advantage of the new display is that it requires relatively little power to operate and offers the potential of extending the lifetime of devices dependent on battery power, Shing said.

Shing, however, pointed out that the technology could be adapted for use in a CRT terminal. The result would be a CRT terminal that gives off very little radiation — a concern among many office workers.

The big roadblock to integrating the tungsten-oxygen display into CRT terminals is speed, Shing maintained. It takes the tungsten-oxygen display about 15 msecs to produce a new image. Conventional CRT screens can do the same thing in about one msec.

Users Group Takes Initiative in Honing Package

By Lois Paul
CW Staff

How does membership in a software package's users group benefit the client organization?

"You get out what you put in" is the response of John Kinker, chairman of the Requirements Committee of the users group for Software Module Marketing, Inc.'s Direct Access Storage Device Management System for OS (DMS/OS) product.

Noting that the economic climate has forced cuts in travel budgets, affecting users group participation, Kinker said, "I think the people who do return will certainly be the ones [in whom] the company recognizes that there is something to be gained . . . It won't be the casual attendee, the minivacation-on-company-expense kind of attendee."

Kinker is a computer systems associate at Rohm & Haas Co., a Philadelphia-based firm, which evidently is agreeable to his spending the time required to organize the reporting of user requirements for DMS/OS. "I spend a lot of time on the Requirements Committee, but I get a lot of benefit because I get to talk to a lot of different people and find out what they do," he said.

DMS/OS runs on IBM and plug-compatible mainframes under OS. It provides a facility to control direct-access storage device (Dasd) usage through a range of marketing reports and a set of modules for taking action on data sets. It is marketed by the Sacramento, Calif.-based Software Module Marketing and was developed by Software Laboratories, Inc. of San Bernardino, Calif. The two firms cosponsor the users group's annual meeting, which last year attracted about 100 of the approximately 600 DMS/OS users worldwide.

Although the users group is user- rather than vendor-controlled, most of the presentations at past conferences have been by the vendors. Most users lack the time to put together a presentation, explained Donna Ward, a technical support analyst for Ciba-Geigy in Ardsley, N.Y., who is chairwoman of the users group steering committee.

"The corporations that we come from don't necessarily want us to spend a . . . lot of time, because we already are . . . spread thin," she added.

Another reason that most of the presentations tend to be by vendors, Ward said, is that the users group members are not as aware as the vendors of what various installations are doing with the product.

However, Software Laboratories became more active in the users group last year and convinced a number of users to make presentations. Both Ward and Kinker agreed the results were excellent. "There was only one vendor presentation. The rest were all from users," Ward reported.

Kinker admitted that the presentations generally are geared toward first users, but said this is helpful for them because "DMS/OS is a very powerful and fairly complicated piece of software. There are a lot of things you can do if you know how." The documentation gives users exits and control-card formats and explains systems parameters, Kinker said, but it cannot tell all of their different combinations to achieve different end results. "So the benefit for a new user is to go talk to people and find somebody with the same sort of problems that they have — Dasd management problems — and find out how they are using DMS and how they combine all of those different parameters."

Group Provides Requirements

One of a users group's major roles is providing the vendor of a product with its users' "wish list" of modifications.

As chairman for the requirements committee for Software Module Marketing, Inc.'s Direct Access Storage Device Management System for OS, John Kinker screens user requirements to determine that they are neither bug reports (which should be dealt with immediately) nor duplicates. He enters the text of the requirement into a data base and mails a copy to all members of the committee who vote on its priority.

Once composite priorities are assigned to the requirement, it is mailed to Software Laboratories, Inc., the developer of the software, which handles its maintenance and support. Software Laboratories must respond within 30 days regarding whether the requirement is accepted, rejected or under study.

If it is accepted, the firm informs the users which release of the product will include the modification. Twice a year the committee sends a status report on requirements to the entire user community.

From 1979 to 1982, a total of 325 requirements were collected by the committee. About a third of them have been made available in the product or have been otherwise accepted by the vendor, Kinker said.

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Poll of MIS Managers Reveals the Majority

By Marguerite Zientara
CW Staff

What would happen to your DP shop if you were run over by a truck tomorrow or — more optimistically — if you were suddenly promoted out of your present position?

The question is one about which DP managers generally have thought and to which they have responded in an informal poll of top management information systems (MIS) executives.

Seven of the 10 DP managers interviewed by telephone recently felt strongly that a manager should train his own replacement and indicated they are actively doing just that.

Of the three remaining, David Mann, director of information services for Horizon Corp. in Tucson, Ariz., admitted he'd "never thought about it before" and wavered momentarily before deciding, "It has to be a good idea — you don't live forever."

Allan Smith, vice-president of DP for Mountain States Financial Corp. in Albuquerque, N.M., felt it was "probably a half-and-half proposition."

A manager "can train for a while, but sometimes the other person needs new ideas and sometimes a manager has old ideas," explained Smith, whose attitude likely stems from the fact that "we just lost someone I was training — to another company here in town."

And while the manager of the DP division of a small railroad in Alaska acknowledged that "you generally need someone capable of taking over in your absence or in an emergency," he still was "not sure it's a good idea over a long period of time."

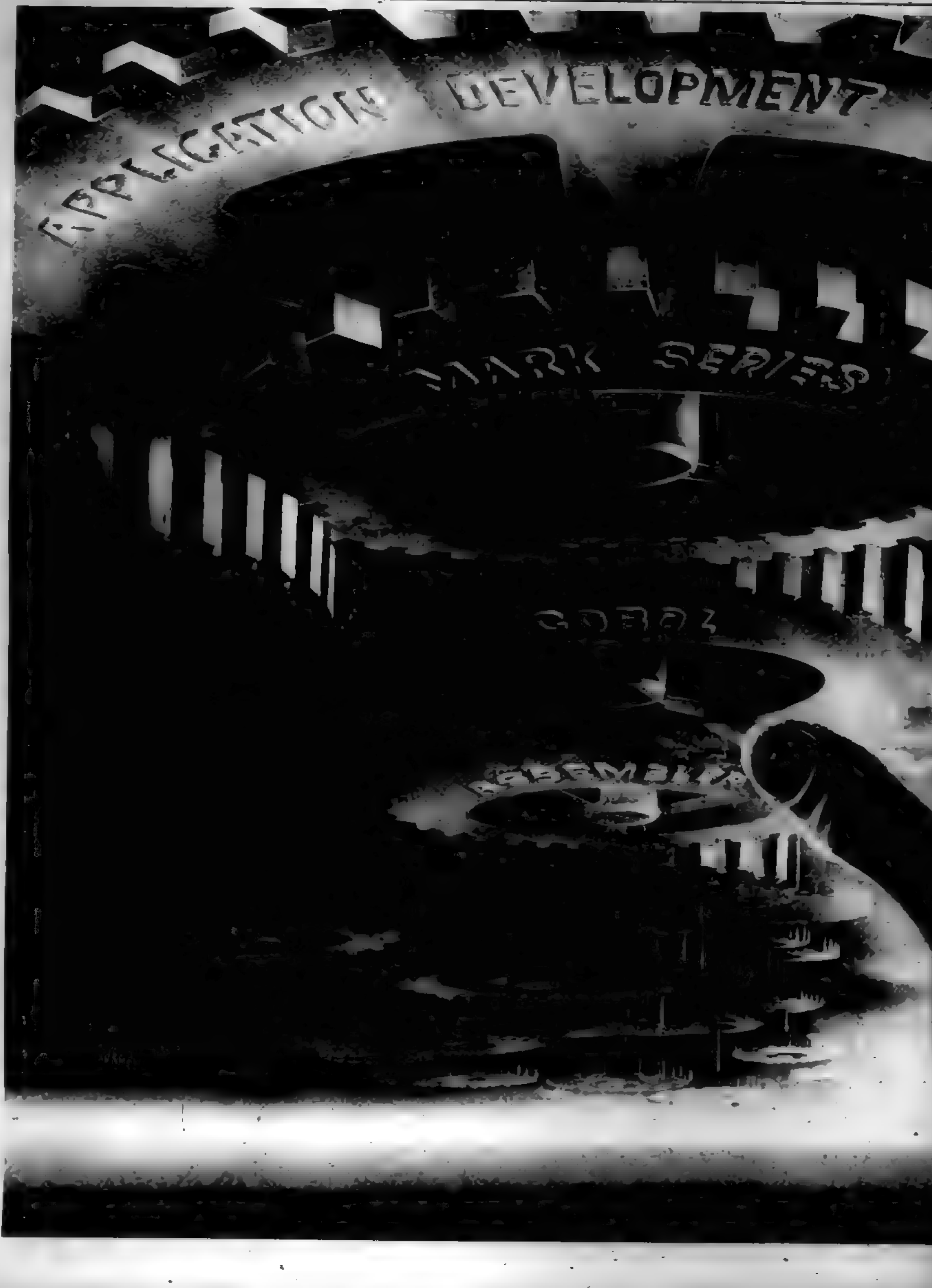
According to the Alaskan, "by the time you get an MIS manager at the corporate level, the organization should integrate him into its long-range strategic planning and they should have someone who's attuned to the business goals rather than DP," making it "almost impossible" to train one person to assume that position.

While that manager has not groomed someone to take his place, he has an appropriate replacement with whom he has worked for many years.

"I could walk out the door today and be perfectly content that she could carry on and still meet the long-range strategic objectives," he said, "but this didn't happen because I planned it that way."

Threat to Job

Only one of the 10 managers interviewed felt — in theory, at least — that grooming someone for his position could pose a threat to his own job. "There's always competi-



Training Methods Of Managers Vary Slightly

Most managers seem to be training their own replacements, according to an informal *Computerworld* survey, and their methods vary only slightly.

Generally, the task involves letting a subordinate in on decision making while getting his opinions on decisions to be made, delegating responsibility to him, giving the person more outside education and basically making him familiar with the operation.

When giving someone increased exposure to the decision-making process, one should "do that by delegating piece by piece so you can watch his level of competency," according to the DP director at a Miami Beach-based communications company.

One manager, who admitted he is training someone but, he said, "I'm afraid not very systematically," explained that he tries "to establish a continuity of management style."

Teaching Many Functions

Steve Badger, recently named director of management information systems (MIS) at Beverage Management, Inc. in Columbus, Ohio, plans to "try to teach someone as many functions as possible, although it's not possible to teach someone all the functions and have him do his own functions at the same time."

Badger would, however, "let him interface with upper management."

Having hired someone "with a fairly good background in DP" with training in mind, Lisle Wood, director of MIS at Montana Power Co. in Butte, Mont., explained, "I really need to train him in other aspects of the operation, such as word processing and records management, since I am in charge of all the information management facilities, including data base.

"I periodically let him run one of the facilities for a month or so," Wood explained, adding that he sends his potential replacement to "schools unrelated to DP, such as data base — how to relate data base to information systems and word processing and so on."

Wood concentrates most of his efforts on one person, but he pointed out that while that person is the likely successor, "it's not a foregone conclusion that he's it — other people as well have some opportunity at this."

Actively Training Replacements . . . Just in Case

tion for these higher jobs," observed Lisle Wood, director of MIS for the Montana Power Co. in Butte, Mont.

"Fifty percent of the time, I'd say if he's better at the job than me, let them have him," he said. "And the other half of the time, I don't know. I guess I don't worry about it too much."

A number of managers felt that training a replacement is a good way to be able to move up in an organization — or even to be able to take a vacation or a day off without worrying about the operation.

"My attitude's always been that the more you can do for the people, the higher you're going to go," the DP manager at the railroad in Alaska said. "They might push you, but it'll be up, not out," he added.

Whether one feels threatened by a well-trained subordinate, the worst can and does happen. Steve Badger, director of MIS for Beverage Management, Inc. in Columbus, Ohio, was trained over a period of five years by his boss. In a recent merger, his boss was among 40 people laid off and Badger was promoted to his position. "My good fortune was others' misfortune," Badger said.

What if Trainee Doesn't Fill the Bill?

What if you try to train a replacement for your position and it gradually becomes obvious that your protegee will not fill the bill?

"I've already gone through that," noted Lisle Wood, director of management information systems for Montana Power Co. in Butte, Mont. "I actually found another job for the guy," he recalled. "If he wasn't trainable, you could conclude that he wasn't successful in the current job he was in."

Wood advised managers to "have at least two people somewhere in the background" as insurance.

While most managers indicated they would stop trying to train a person who did not seem to be working out — and one person said he would "terminate him" — a single manager said he would continue trying to train the person.

"As long as they're good at their present job, any added knowledge is bound to make them better . . . it's not wasted time," said the production manager of the data center of a Chicago-based publishing company.

Robert Weiser, director of information systems for Bangor [Maine] Hydro Electric Co., stressed that such a situation would "not necessarily be detrimental to how I feel about their present position, especially if it became more of a waste of my time [to train them]."

Of course, it is easier to stop grooming someone as your replacement if you never told them they were being trained in the first place. "If I'd already told the person [my job was opening up], I'd be in a little trouble," explained Allan Smith, vice-president of DP for Mountain States Financial Corp. in Albuquerque, N.M.

"But if I hadn't told them, I'd just discontinue giving them new responsibilities, and I might take somebody I'd put under them out from under them and put them back to their old status," he added.

"But if I'd already told them, I'd really be in a bind — I'd have to tell them the truth, that I didn't think it was working and that the position probably wasn't something they were capable of handling," he said. "I'd better not make that mistake," he concluded.

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Cincom to Hold Users Conference

CINCINNATI — Cincom Systems, Inc. will hold a National Technical User Conference here March 20-24.

"The New Era of Information Systems" is the theme of the conference, which was designed to help Cincom users leverage high performance and productivity from the software technology now available to them. This "technical university" for Cincom users will feature industry speakers and consultants, the introduction of major new Cincom products and more than 25 classes for users of the vendor's products.

Author and lecturer James Martin will address "The Impact of Emerging New Technologies." Carma L. McClure, a consultant and author, will make a presentation on "Structured Techniques for Fourth Generation Languages."

Greg Williams, vice-president of the Gartner Group, will provide strategic projections for the decade of the '80s.

The conference will be held at Stougger's Inn in downtown Cincinnati and the adjoining Cincinnati Convention Center. Further information is available from Cincom at 2300 Montana Ave., Cincinnati, Ohio 45211.

CW Soliciting Articles on Software

Are programmer productivity packages helping you stretch your DP resources?

Computerworld is planning a Special Report on software packages that improve programmer productivity. Slated to run in the June 27 issue, it will cover systems and utility packages as well as decision support systems, fourth-generation languages and any other nonapplication package tools that programmers use to improve their overall efficiency.

CW is looking for application stories and case studies which describe how these types of packages have worked in your installation. In addition, tutorials (concept pieces that are not product-specific) are welcome on topics such as "How do you determine what type of programmer productivity packages you need?"

Copy should be submitted by May 6. Please limit the length of the articles to four to seven pages typed, double-spaced. Preference will be given to articles with black-and-white photos (any size) or charts or graphs (originals rather than copies are appreciated).

Copy should be submitted to CW staff writer Paul Gillin, who can also provide a one-page handout providing further details on the Special Report. Gillin can be reached at *Computerworld*, P.O. Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

Boston's 28-Hour Blackout Threatens DP Systems In Busy Financial District

By Paul Gillin
CW Staff

BOSTON — While storms that pounded the West Coast during the first week of March caused only spotty problems for DPers there, it was a clear day on March 4 when a blackout paralyzed this city's financial district and a number of computer systems for a nerve-racking 28 hours.

The outage hit several of Boston's key institutions, including New England Telephone Co. and the area's largest bank. But it was the smaller firms that bore the brunt of the lost day of business.

First National Boston Corp.'s Federal Street skyscraper went black but business continued largely on schedule. "Our computer center is located four miles to the south," said William Synnott, senior vice-president of information systems and services. "For those applications that only had input downtown, we sent emergency personnel [to the computer center] to key in information by hand."

Some minicomputer applications were all that was lost, Synnott said, but they were brought up the next day. A generator kept the bank's vital wire transfer operations going.

Generators a Godsend

Generators proved a godsend for other businesses, too. The world headquarters of the Sheraton Corp. installed a diesel generator only a few months ago. When the lights went out, the motor kicked in and the computer center was running with a loss of about 20 seconds of power.

"The whole worldwide reservation system runs through here," said John Pignataro, vice-president of data processing and systems. "If we'd lost it for 28 hours, we'd have been out a few dollars."

Operations manager Mark Hurwitz said the generator was installed last year with memories of the Northeast blackout of November 1965. "The decision was made as an insurance policy," he said. "Apparently it's one they wisely took out."

Other businesses were not so lucky. Internal systems supervisor Roberta Schwartz was out of her office at the Arthur Andersen & Co. accounting firm when the blackout hit. Because arrangements had not been made for powering down the office's Microdata Corp. minicomputer, the CPU was knocked out by a power surge when the lights came on Thursday evening.

"We lost a day's time," Schwartz said. "Fortunately, there were no head crashes. I'm very surprised there weren't more problems."

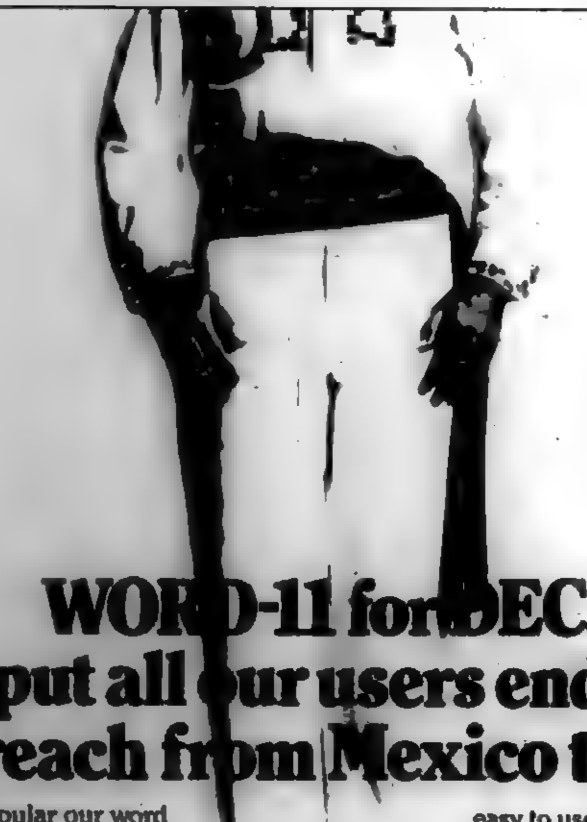
To prevent future troubles, Schwartz has left detailed instructions for powering down the system in an emergency.

The company has also made alternative arrangements for processing the payroll elsewhere, should disaster strike on a payday.

The computer staff at Inservco, a mutual funds dealer in Boston, worked through the weekend to make up about 10 lost hours of computer time, according to Anton Thiel, senior vice-president.

Despite the interruption, Thiel said it is unlikely that the small company will take action to prepare for a future blackout.

"There'll be a lot of talk about it, but I would bet that not a lot will get done," he explained, "because somebody's going to figure the odds are long on this kind of thing happening again. But if we have another blackout in the next six months, I think it will get a lot of attention."



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Entrepreneur Working On 'Electronic Jury'

By Bruce Hoard
CW Staff

LA JOLLA, Calif. — The "electronic jury" sits dispassionately, weighing the evidence it has ingested. When the computer reaches a verdict, it delivers it orally to the courtroom. Case closed.

Such is the scenario envisioned by former robotmaker turned electronic-legal-beagle Bernard Lumbart, who said, "All we're doing is lighting the fuse. If we don't do it, somebody else will."

Lumbart is the founder of General Robot Corp. He maintains that a computerized jury is more accurate, unbiased and open than its human counterpart. Furthermore, he said in a recent interview, the current legal system is so bad, that it can only be improved.

And here is how he would do it. The two basic components of his controversial jury are his Zilog, Inc. Z80-based California Computer Products, Inc. computer system and a compilation of legal treatises known as the American Jurisprudence Proof of Facts, which lists the facts that must be proved in different types of legal cases.

There are six such basic elements to be proven in, for example, a robbery case, Lumbart said. The human attorneys would be asked to present their evidence, and the computer would decide whether a fact is accepted or rejected. The computer is simply used to quantify the facts. If a fact is accepted, it is placed in a vector or table.

"When you get up to 80% of proof of any one fact, that fact is proven," Lumbart said. "Or when you get to 90% of some other fact, that fact is proven. When you get all the rows and columns added up, you've got a man on his way to state prison for robbery. That's how it works in theory."

Only in Theory

Lumbart's problem is that so far, it only works in theory. When he attempted to present filings on behalf of a federal bankruptcy client, the filings were "utterly rejected" and he was enjoined from further courtroom participation, he said.

Although the name of Lumbart's company is General Robot Corp., it has not offered a robot for sale since the late 1960s, when Lumbart unsuccessfully tried to sell a military robot to the Army. Lumbart is now concentrating on writing software for the electronic jury.

Attorney Daniel T. Brooks of the suburban Washington, D.C., law firm Computer Law Advisers expressed skepticism about Lumbart's innovative legal approach. "Like any other quantitative science, what he's depending on is somebody assigning values and probabilities to something," Brooks commented.

Brooks said Lumbart is trying to use statistics and objective criteria to perform "highly objective" processes. He compared it to somebody interested in buying a computer and using an arbitrary weighting system to decide which system to buy — a process that can be easily rigged, the lawyer declared.

"You can decide whether the guy's guilty by determining what level of proof you're going to require for a particular fact," Brooks observed. However, the legal process can be more systematized, and a system based on Lumbart's could serve as a useful tool for evaluation under the proper circumstances, he noted.

DP Law Program Set for May 12 In Los Angeles

LOS ANGELES — The University of Southern California Law Center will sponsor its fourth annual Computer Law Institute here May 12-13.

This year's program will focus on structuring agreements for the distribution of computer products domestically, and internationally. Other subjects to be discussed include proprietary rights, antitrust issues and major system procurements.

In addition, an optional session will be presented on the basics of computer products and technology.

The conference costs $350 ($295 if paid by May 1). Single-day registration costs $240 ($195 if paid by May 1). More information is available from Ami Silverman, USC Law Center, University Park, Los Angeles, Calif. 90089.

Directory Bows On DP Vendors

CHICAGO — The Chicago Computer Works is offering "The White Book," a directory of computer vendors, products and prices.

The book contains a listing of more than 100 vendors of systems, disk drives, printers, plotters and monitors.

"The White Book" will be issued quarterly starting April 1. Each book costs $69.95; a year's subscription costs $139.95, from 7061 N. Kedzie, Chicago, Ill. 60645.

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Users Systems' Stability Termed High Priority

By Jeffry Beeler
CW West Coast Bureau

SCOTTSDALE, Ariz. — The task of keeping corporate information systems continuously available and stable for users warrants considerably more management attention than it typically receives, according to State Farm Insurance Co.'s assistant DP director James Yates.

Large-scale computing shops can ill afford to allow unscheduled downtime to deprive users of their much-needed system resources, Yates said earlier this month during Applied Computer Research, Inc.'s annual conference on performance management here.

If an unplanned resource outage does occur, it had better be kept as brief as possible, Yates added during a brief session on "Managing [Systems] Change."

In today's heavily automated world of big business, systems availability and stability have become so "critical," he said, that they require close and continuous monitoring by a designated DP staff member.

At State Farm, the responsibility for maintaining an adequate level of systems availability and stability rests squarely on the shoulders of the company's manager of technical support.

But State Farm is probably an exception. At most other companies, the rules of accountability have yet to be so carefully and unambiguously defined, Yates said. Only a comparative handful of big businesses have gone as far as to make corporate DP availability and stability the exclusive responsibility of one individual.

State Farm's rather unusual approach to the problem of maximizing system uptime is one of the "keys" to the firm's success in implementing a DP change-control program, Yates said.

But no strategy for controlling systems changes, no matter how effective, can entirely insulate a company from disruptions in DP availability and stability, he added. Change-control procedures tend to lose some of their effectiveness during user efforts to convert or upgrade to a major new system.

Yates based his conclusion on State Farm's own experiences in implementing a DP change-control program. During the first quarter of 1982, all the company's hardware and software changes were temporarily halted to allow the organization to devote its full attention to application development. The "freeze" on system changes cut State Farm's three-month total of resource outages to roughly 50.

Only one quarter later, however, the number of downtime incidents approximately doubled — a development that coincided with the start of the firm's conversion to IBM's MVS/SP 1.3.

"Our shop was one of the first in the country to migrate to 1.3, but the installation nearly killed us, even though we had an effective change-control system already in place," he recalled.

Yates' experiences with his company's recent MVS/SP 1.3 upgrade have convinced him that the installation of new hardware seldom causes major stability and availability problems. But the opposite is frequently true of conversions to new software, he said.

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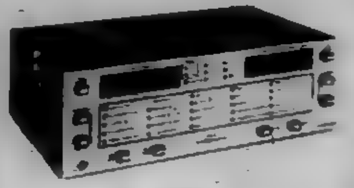

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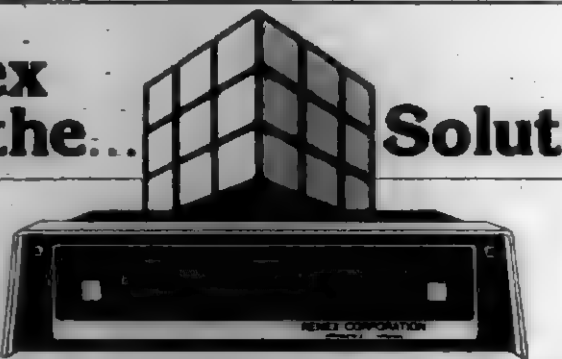

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Systems Managers Urged To Polish Business Skills

By Jeffry Beeler
CW West Coast Bureau

SCOTTSDALE, Ariz. — Information systems managers will have to concern themselves more with business than with technology if they expect to contribute to their companies' long-range objectives and effectively interact with top management.

That thought was expressed independently by two speakers at a recent DP performance management conference sponsored here by locally headquartered Applied Computer Research, Inc.

"People who work in the [computing] field have to view themselves as businessmen or businesswomen first and systems professionals second," according to General Electric Credit Corp.'s equipment operations manager, Stewart Stern.

"As managers of a costly corporate resource, they have to have at least some knowledge of finance and accounting. They also have to know how to negotiate contracts and be able to assess the impact of system changes on their companies as a whole."

Stern's sentiments were echoed at the conference by Boole & Babbage, Inc. Vice-President David Vincent, who also serves as general manager of the Institute for Software Engineering.

"Gone are the days when information systems managers can think of themselves just as DP technicians," Vincent said. "Today, they also have to understand fully what kind of business they're in and be able to serve as guardians of the corporate resource called information."

To transcend the bounds of their narrow technical specialties and understand DP's place in the overall corporate scheme of things, computing professionals first must learn how to think and communicate in terms that upper management can readily digest.

In preparing performance-management reports, for example, systems department heads should eliminate all references to CPU utilization figures and other such highly technical data, which senior executives typically find "meaningless," Vincent said.

In the final analysis, he said, one of a performance-management report's main reasons for being is to show top managers exactly how a shortfall in systems capacity would ultimately undercut corporate profits.

So to be effective, a performance-management report should dispense with all extraneous technical details and concentrate instead on providing upper management with a high-level, strategic overview of systems operation, Vincent said. Armed with such an overview, senior executives will then be in a position to decide how best to match system resources to their organizational objectives.

Apple Book Released

LOS ANGELES — Array, Inc. is offering the 1983 edition of *The Book of Apple Software.*

The book reviews various programs on an A through F scale. Programs are given an overall rating, then are judged by their cost value, vendor support, documentation, error handling and reliability.

The 491-page book costs $19.95 from Array, 11223 Hindry Ave., Los Angeles, Calif. 90045.

N.J. Governor Seeking To Modernize State System

By Paul Gillin
CW Staff

TRENTON, N.J. — Declaring that "New Jersey can no longer afford the luxury of our outdated and inefficient method of processing information," Gov. Thomas Kean has asked the state legislature for $20 million to modernize the state's computer system. The request was made despite the fact that New Jersey must cut $350 million from its operating expenses in order to comply with a state law mandating a balanced budget.

The initiative is contained in a $6.8 billion budget request Kean submitted to the legislature on Jan. 31. The appropriation would be used primarily to tie together the state's five data centers in a network and to set up an Office of Office Automation. The state will also look at the organization of DP within the state with an eye to establishing a central DP authority.

The recommendations are one result of a joint review of state spending undertaken by representatives from private industry and state government and administered by the state Treasury Department's Office of the Budget. The Governor's Management Improvement Plan quickly targeted data processing as a deficient area, according to Michael O'Neal, a management analyst in the Office of Management Services.

"We assessed how far out of line [DP was] with model states and found we were lagging badly," O'Neal said. "Some people commented that the tools we were using were a generation apart from current technology."

Current recordkeeping procedures are so outmoded that in some departments all records are still processed manually, according to Dennis Clark of Science Management Corp., a consulting firm hired by the Management Improvement Plan. "The Temporary Disability Department has 240 employees processing claims in what is really a green eyeshade operation," Clark said. "By automating, we estimate we could reduce that force by 30 to 50 people through attrition and reduce the level of management."

The state's five DP centers report to the departments in which they are located but service other departments as well, Clark said. The DP department in the Department of Transportation, for example, reports to the Secretary of Transportation but serves nine other departments. And none of the state computer systems can communicate with one another.

DP operations are so disjointed, he said, that a request for a microcomputer takes about nine months to process.

The budget request is scheduled to be taken up in joint legislative hearings on March 15. The issue will not be the need for computerization so much as the sacrifices other departments will be required to make, a Senate spokesman said. No major opposition to the governor's initiative has yet been expressed in the legislature.

Kean will justify his initiative by pointing to savings individual departments will realize through reduced administrative costs. State authorities pay for DP services as they are used, in the same style as a service bureau. "If these monies [$20 million] are not made available, more dollars will be required by the various departments to maintain current service levels," the request stated.

The $20 million request represents a "first step," according to a spokesman for the governor.

New Jersey has been scaling back its DP operations since 1972. At that time, there were 13 data centers and 28 separate computers, Clark said.

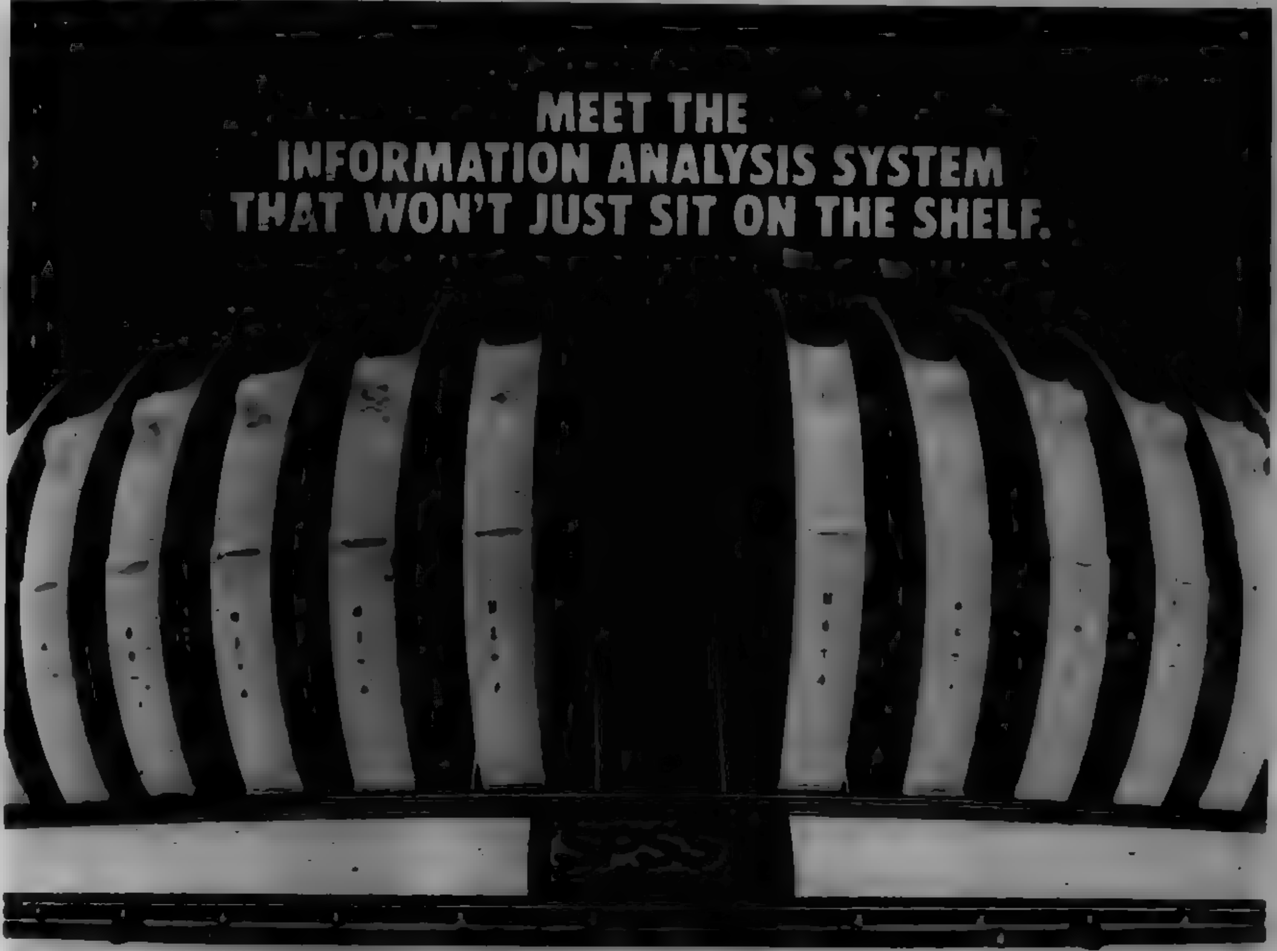
Dvorak Keyboard on Trial in N.J.

NEWARK, N.J. — An experiment currently under way in New Jersey is expected to provide enough data to convince state officials to convert the state clerical staff of 7,100 to the Dvorak keyboard. The move is expected to bring a $7 million savings in the first year.

The experiment, under way in Trenton and planned for Newark, provides training on both the traditional Qwerty keyboard and on the Dvorak keyboard — embraced last week by the American National Standards Institute [CW, March 7] — for state employees, handicapped clients of state agencies and the unskilled unemployed.

The project has the backing of New Jersey's governor, the civil service commissioner and other influential state officials, according to Larry Picatello, regional training manager of the New Jersey Civil Service Department, which is conducting the experiment.

Picatello estimated conversion costs at $60 per typewriter, $70 to $100 for training per person and the additional cost of release time. But Picatello expects to more than make up those costs in reduced fatigue, lower absenteeism, higher productivity leading to as much as a 5% to 8% reduction in employees and fewer repairs to Dvorak keyboards resulting in estimated savings of $7 million.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MIS Groups Predicting Budget Growth: IDC

By Patricia Keefe
CW Staff

BOSTON — Although their expectations that they would spend substantially more in 1982 than 1981 did not pan out, management information systems (MIS) departments are again projecting strong budget growth in 1983, particularly in the areas of software, services and communications, according to a recent information industry briefing session sponsored by International Data Corp. (IDC).

Other user plans for '83 include the education of end users, consideration of advanced communications, a response to diverse equipment types and a review of long-range plans.

At last year's briefing session, IDC's suggested concerns as the industry "approached the bottom of the recession trough" included saving money, trimming recruitment dollars, scrutinizing communications expenses, increasing equipment price/performance ratios, deferring staff additions and taking advantage of the 1981 Economic Recovery Tax Act "to get more bang for the buck." Almost universally, MIS was asked to do more with less in '82, noted Tom Willmott, program manager for IDC's Strategies for Office Systems user program.

Therefore, despite users' fall '81 expectations for high budget growth in hardware, software, services, communications and other areas, actual results for '82 were much lower, to the point of dropping below '81 growth plateaus in some areas, Willmott said.

Quoting *Business Week*, Willmott said the reasons for what he called "such a precipitous decline" included the three-month moving average for inflation, which dropped from nearly 12% when the '81 survey was done to less than 4% in October of '82, where it remains today. He also pointed to the Index of Industrial Output, which was 150 in January '81 and dropped to 136 in Oct. '82.

Continued purchasing of equipment outside the centralized authority of the MIS department, which affects the MIS budget, is another factor, Willmott said.

An IDC-sponsored user survey taken in fall '82 indicated that users believe '83 will be better. Pointing to anticipated growth figures for 1982-83, which reflected the unmet growth predictions for 1981-82, Willmott said that "while more normal for our high-growth industry, these numbers might be considered equally perplexing. Are they left over from an inflationary mindset? Or are they overly optimistic?"

Willmott suggested that packaged products will continue to be attractive to MIS departments short on staff in specialized areas, which are growing.

In addition, the importance of communications features is becoming more widespread. "Nineteen eighty-three is the year of the local-area network," he said. Interest level in communications is high, according to Willmott, especially if users can "piggyback" a feature onto existing equipment.

CW Photo by P. Gillin

'Nineteen eighty-three is the year of the local-area network,' said IDC's Tom Willmott.

Fortune 500s Seen Purchasing 50% of Micros

BOSTON — About one microcomputer in five ends up in a large company, and 50% of the micros purchased in retail stores land in Fortune 500 companies, according to a survey of 30 large corporations released by International Data Corp. (IDC) at its 1982 Information Processing Industry Briefing Session held here recently.

With multimillion-dollar buys of micros underway, management information systems (MIS) executives are faced with the problem of "what to do about the [micro] plague," according to Tom Willmott, program manager of IDC's Strategies for Office Systems user program.

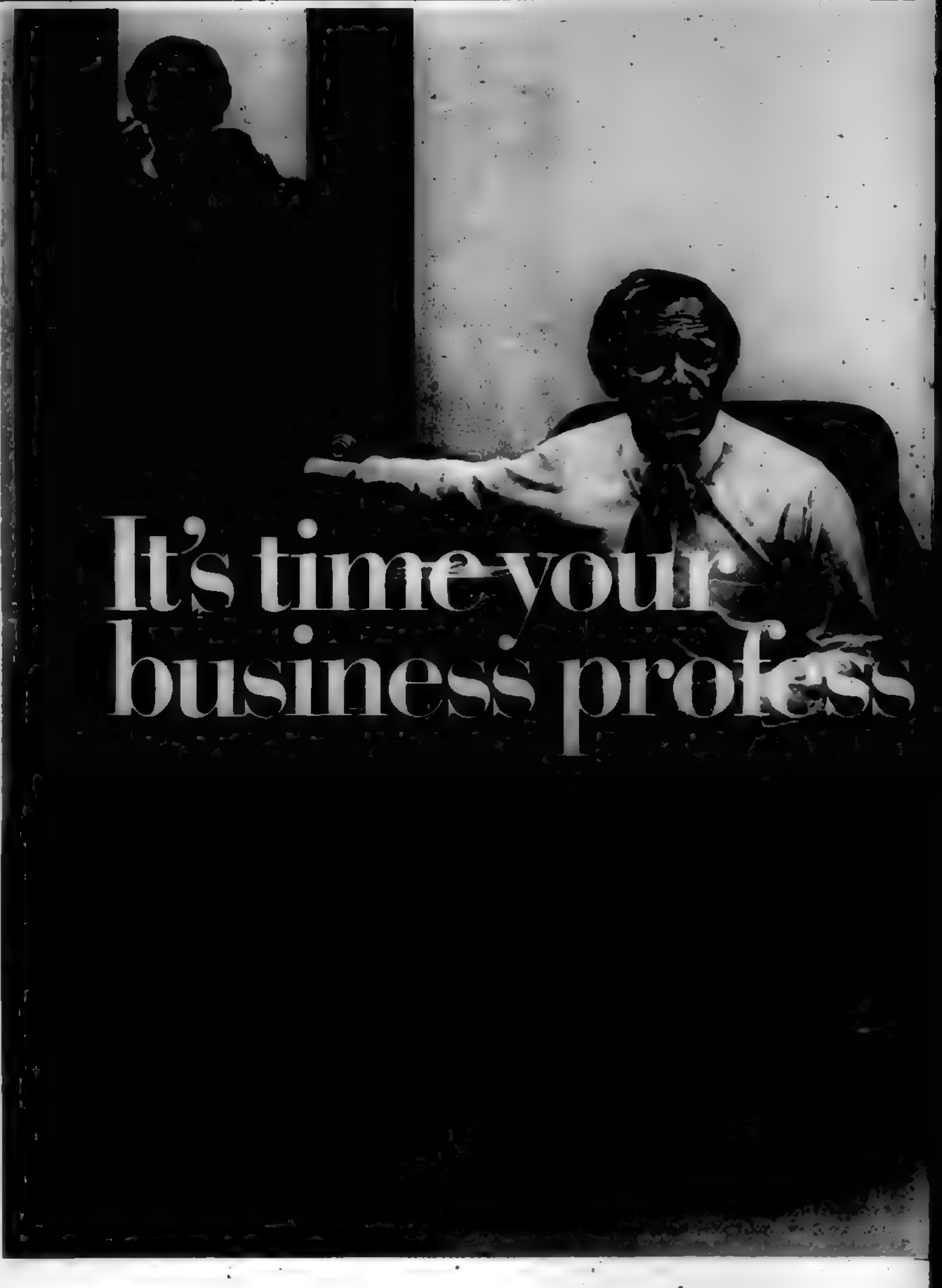
As a result, serious planning challenges will evolve in the '80s that are unrelated to the traditional management responsibilities of the late '60s and '70s.

Rapid Proliferation

At the focal point of this change is the rapid proliferation of small systems, Willmott said.

"Clearly we are in a situation where the training of end users and a number of other management issues may tend to impact the delivery of

(Continued on Page 22)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End-User Needs Will Drive Software Mart Through 1988, IDC Researcher Predicts

By Paul Gillin
CW Staff

BOSTON — End-user requirements will drive the software market for the next five years as declining hardware costs and advances in user-friendly methods expand the availability of DP resources, according to Ann Morley, senior research manager of software and services for International Data Corp. (IDC).

Speaking at the recent IDC Information Processing Industry Briefing Session here, Morley said the information center concept will flourish in the near future. IDC predicted 53% of all sites running an IBM 30 series mainframe will have by the end of the year a center in place to support end-user requirements.

"Shops will be gunning to act like commercial time-shared vendors," she said.

Packaged Applications

Many vendors have responded to user needs by offering packaged applications, a trend that will continue, Morley said. IDC predicted a steady growth in packaged software revenues from $5.5 billion in 1982 to $28 billion by 1988, a 37% annual increase. Suppliers of application tools will see the greatest growth, with those packages occupying 37% of the market by 1987, she said.

IDC expects microcomputers to change the face of the software industry, Morley indicated. Annual sales of microcomputer software are expected to grow from $965 million in 1982 to nearly $7.5 billion in 1987, IDC estimated. Independent suppliers will continue to turn out the lion's share of micro software. Independents already supply 50% of that market, and their share is expected to grow to 55% by 1987, according to IDC figures.

CW Photo by P. Gillin

"Shops will be gunning to act like commercial time-shared vendors," IDC's Ann Morley predicted.

"When IBM and DEC [Digital Equipment Corp.] entered the [micro] marketplace, they believed their sales depended on independents being able to supply software," Morley said. "The speed of growth [in the micro software market] is largely due to this."

The '80s will also see a change in distribution channels for all kinds of software, Morley noted. Increasingly, packages will become available over cable and telecommunications networks. Microcomputer packages in particular will be distributed to mass markets with vendors taking a lesson from Madison Avenue in slick packaging techniques.

"In the new mass marketplace, software technicians will concern themselves with advertising, price competition and distribution," Morley said. Already, the major microcomputer software vendors are spending 10% to 15% of their budgets on advertising, she noted.

IMC Distributes Second Edition

BETHESDA, Md. — The International Information Management Congress (IMC) is distributing the second edition of *Fundamentals of Systems Analysis*, first published in 1981 by John Wiley and Sons.

The authors — Jerry FitzGerald, Ardra F. FitzGerald and Warren D. Stallings Jr. — cover each step of a systems analysis from the problem definition through system design to the final implementation.

New topics presented in the second edition include software engineering, structured design and data base management systems.

The 590-page hardbound text costs $39 from IMC, Publications Sales, P.O. Box 34404, Bethesda, Md. 20817.

Vsam Course Offered For IMS Programmers

BELLEVUE, Wash. — Software Information Services, Inc. is offering "Vsam For IMS Programmers" for presentation around the country. The course will also be given June 7-10 by the First National Bank of Chicago.

The course is said to cover the features of Vsam data set structures that interact with IMS such as Vsam data set usage within IMS access methods and IMS buffering techniques.

An on-site presentation costs $3,100, plus the expenses of the instructor. For attendees, the course costs $230 per person. Software Information Services can be reached through P.O. Box 4132, Bellevue, Wash. 98009.

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Multifunctional Desktop Units Predicted To Take Dominant Position in OA Tech

By Paul Gillin
CW Staff

BOSTON — Office automation, a technology identified with word processing and imaging systems, will expand in scope in the latter part of the decade with multifunctional desktop computers taking over the dominant position, according to David Terrie, senior analyst/office automation at International Data Corp. (IDC).

Speaking at IDC's Information Processing Industry Briefing Session here recently, Terrie predicted the office system of the future will feature expanded voice/data communications capabilities, data base management systems, improved graphics and simpler human interfaces. IDC expects the market as a whole to grow to $44 billion by 1986, a compound annual growth rate of 21%.

Intense competition between word processing, data processing private branch exchange and desktop computer vendors and suppliers of computer services will present the end user with a wide range of options, Terrie said.

Terrie called the desktop computer "the terminal of the future," but indicated that vendors must move confidently into the market to establish a presence. "[Apple Computer, Inc.] went after the market early and their results have shown," he said.

He quoted an IDC survey that showed that 64% of businesses using desktop computers do some word processing on the machines. However, desktops have not yet offered any real competition to word processing vendors, he said. That is expected to change: IDC estimates that by 1986, about 85% of small business computers will have some word processing functionality.

Local-Area Nets

Terrie called local-area network standards "a political football deflated" and predicted that local-area network technology will be driven by the base of installed devices. "Standards aren't going to make it in the office," he said. "Instead of compatibility through standards, we'll get conversion options that will convert code from one vendor to another."

Trends in imaging technology will be toward improvements in high-speed dot-matrix printers, the quality of which is already approaching daisywheel letter devices, Terrie said. Facsimile technology will move toward higher resolution graphics printed on plain paper. And a steady decline in prices will continue to characterize the imaging field.

Watch for better graphics integration in 1983, he advised. Conversion facilities will improve to link systems from small vendors with those of major manufacturers. Documentation, both hard copy and on-line, will improve, particularly for desktop computers. And look for more simple user interfaces along the lines of Apple's mouse and icon. "That's definitely the wave of the future," Terrie said.

Micro Trends Surveyed

(Continued from Page 20)

systems and the effective use of them in our organizations at least in the near term," Willmott said.

For example, "many end users have already charted the perilous do-it-yourself course in computer acquisition, often without the slightest notion about operating systems, data security or application software availability or any of an entire group of critical concepts to which they're really completely oblivious," Willmott said.

As a result, MIS departments are swamped and burdened with requests to evaluate or install equipment for end users.

The pressure keeps building for the information systems specialists to provide technical management leadership on a whole range of new systems, Willmott said.

Two Forces

Where the use and purchase of micros is concerned, Willmott identified two such forces at work: end users wanting to avail themselves of the processing power of technology vs. centralized MIS, which has to work under formal guidelines and wants to maximize the organization's manpower and financial resources.

"There's a lot of foam on the water here, and we are still waiting to see how it should be resolved," Wilmott maintained.

While the percentage of all computers purchased within the organization is slowly slipping out of MIS control, the MIS department is gaining control over the purchase of micros.

The percentage of micros acquired under MIS control has risen from 3% in 1977 to 15% in 1982 and is expected to grow to 35% by 1987, Willmott noted.

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To Promote Science, Mathematics

House Passes Education Bill for Up to $1 Billion

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The House of Representatives has passed a mammoth education bill that would provide as much as $1 billion over five years to increase technical personnel availability, assist computer instruction and promote science and mathematics education in the U.S.

The Emergency Mathematics and Science Education Act, whose Senate counterpart is already under consideration in that body, was approved 348 to 54 by the House on March 2. One section of the bill would establish a special engineering and science personnel fund of $100 million for each of five years beginning in 1984 within the National Science Foundation (NSF).

The fund is needed, the legislation says, because of the "pressing need for trained technicians and engineers for the nation's industry and defense, with particular concern for such high-technology fields as electronics, information technology and energy."

Under the bill, NSF grants would be awarded for, among other things:

- Recruitment and retention of new engineering faculty at colleges.
- Development of systems for post-secondary technical, engineering and scientific education with special emphasis on computer accessibility.
- Precollege science and mathematics education and training, including programs to promote cooperation and exchange of resources and personnel with industry and other elements of the private sector.

According to the House Education and Labor Committee, demand for computer engineers is expected to exceed supply by 40% in 1985; DP technicians demand is expected to grow by 148% by 1990; and the demand for computer analysts will rise 80% by the end of the decade.

Without the concerted program of teacher development embodied in the bill, those demands will go unmet, according to the committee, which had earlier approved the bill 27 to 3.

The House Science and Technology Committee, which joined the education panel in drafting the legislation, sent it to the House floor on a unanimous vote of approval.

National Crisis

One supporter of the legislation, Rep. Tom Harkin (D-Iowa), said "the situation with respect to computer-related degrees is approaching the level of a national crisis. With more and more students clamoring for computer degrees, and at a time when there are roughly twice as many computer-related jobs as there are graduates to fill them, the pool of qualified teachers has been drying up."

Picking up the theme of a technical manpower and teaching "crisis" — a term used frequently throughout the House debate, Rep. Thomas E. Coleman (R-Miss.) warned that "our citizens are rapidly becoming unable to deal with the computer age, in jobs or at home, and soon many of us will be computer illiterates."

The bill's supporters likened the legislation to the 1958 National Defense Education Act, a measure passed following the 1957 launching of the Soviet *Sputnik* satellite and designed to remedy the perceived failings of American science and engineering education. The new legislation, however, is aimed more at answering the high-tech challenge of this country's competitors in Japan and Western Europe.

A second section of the bill would provide an initial, one-year amount of $325 million — with an unspecified amount to follow in later years — to be administered by the Education Department to promote mathematics, science and foreign language improvement programs at the elementary, secondary and post-secondary education levels. This section is aimed at alleviating what the bill's sponsors called a "critical" shortage of math and science teachers at all levels.

The bill targets the money for student scholarships and teacher training and retraining in these areas. This legislative provision has similar strong, bipartisan support in the Senate but is far in excess of the $50 million proposal submitted earlier this year by the Reagan administration for mathematics and science education programs.

MIT June Meet to Probe Managers' Changing Role

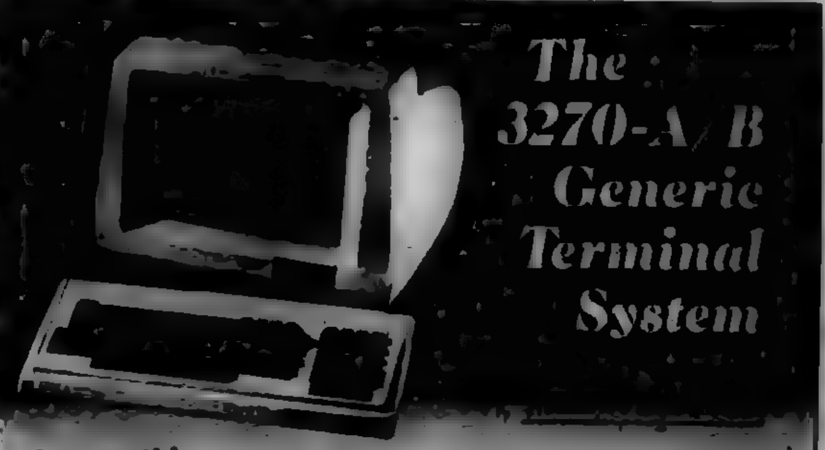
CAMBRIDGE, Mass. — MIT's Center for Information Systems Research (CISR) has announced that its summer session, "Current Issues in Information Systems: The Changing Role of Information Systems Management," is scheduled for June 13-17 at the Hyatt Regency Hotel here.

The session will emphasize managerial, organizational and technical issues related to information systems management, a spokesman said.

General sessions will cover such areas as management of end-user computing, personal computer technology and industry trends, decision support systems, human resource management for information systems, planning for office automation and strategy and policy issues, a spokesman said.

Elective sessions reportedly have been slated to include areas such as: implementation strategies, project selection, project management, computer conferencing, privacy protection and data flow restrictions and critical success factors as well as telecommunications.

Tuition for the seminar is $1,650, a spokesman said from CISR at MIT, Sloan School of Management, E40-193, 77 Massachusetts Ave., Cambridge, Mass. 02139



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In International Telecommunications

Move Now on Policy Formation, NTIA Outlined

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The U.S. is risking a "catastrophe" in the international telecommunications and information arena because of the federal government's failure to respond to political, economic and defense challenges to American interests, the Commerce Department concluded.

Discussing emerging national and international "restrictive trends" in this environment, Commerce's National Telecommunications and Information Administration (NTIA) told Congress this month that "a gradual erosion of the U.S. position in the telecommunications, information flow and associated high-technology markets may result, absent prompt remedial action."

The NTIA's ominous conclusions were outlined in a 300-page report mandated by Congress in an NTIA spending bill passed last year [CW, Sept. 6]. The agency solicited interagency support and received 44 private sector comments in producing its massive study of long-range U.S. goals in international telecommunications and information.

The NTIA document discussed in detail goals, policies and strategies, where they exist and developed numerous alternatives for upgrading U.S. government structures to respond to new developments. NTIA supported its "harsh conclusions" by noting a long history of federal failure to come to terms with this topic's "critical implications" for U.S. social, economic and political interests and examined the increasingly aggressive foreign policies restricting American high-technology enterprises.

U.S. participation in international organizations, particularly the International Telecommunications Union, is included in the study, as are separate chapters on telecommunications facilities and networks, including the role and future of the Federal Communications Commission; international telecommunications services; trade in equipment and services; information, including transborder data flow and intellectual property rights; research and development, including government support and tax policies; and national security, including defense considerations and encryption.

The report stated: "The U.S. government has undestaken false starts in seeking to prepare itself to respond to these situations. Policy has evolved in piecemeal fashion. Problems have been aggravated by inadequate high-level attention and insufficient coordination among the diverse departments and agencies involved.

"The net result," NTIA said, "too often has been confusion, needless jurisdictional disputes and consequent lack of adequate preparation — all of which place the U.S. at a serious disadvantage." Calling for a reexamination of U.S. strategy and government organization, the report warned "that interests at stake demand high-level attention and serious political commitment to ensure that U.S. interests are not compromised by default."

The "optimal government structure," the agency suggested, would be characterized by, among other things, high-level attention and responsibility, a central locus of coordination and decision making with adequate authority for implementing policy, expert technical and negotiating staffs, efficient data gathering mechanisms and an expeditious and effective private-sector problem-solving apparatus.

Looking realistically to the future, NTIA said "foreign resistance to marketplace principles" — a keystone of U.S. policy in this area — "is often solidly entrenched, and international support for free flow of information is by no means on the rise."

The agency suggested the U.S. "should thus seek to avoid the development of any omnibus, all-encompassing treaties or manifestos that would impose a rigid structure on an area in which problems and opportunities cannot be effectively anticipated given the rapid pace of technological and commercial change." Instead, the report said, U.S. strategy "should support the attainment of broad objectives on an issue-by-issue basis through consistent, coordinated preparation and positive action."

Telecommunications Goals

WASHINGTON, D.C. — Free flow of information and free competitive market enterprise are the two broad principles to which the U.S. will adhere in working toward its goals in international telecommunications and information, the National Telecommunications and Information Administration (NTIA) said this month.

Defining particular U.S. goals in this area, NTIA pronounced that basic, long-term American goals "are those which, if achieved, will provide a stable national and international environment commensurate with our basic principles of national existence." Sheltered beneath that lofty policy umbrella, NTIA said, this nation's principal goals include assuring:

- The free flow of information worldwide, subject only to the most compelling national security and personal privacy limitations.
- The necessary growth of the national security, public service and commercial interests of the U.S. occur in a manner commensurate with its leadership role in the world.
- That information flow to developing nations contributes fully to the elimination of hunger, poverty, disease and ignorance and facilitates their sound economic development.
- There is a free and competitive marketplace for telecommunications and information services equipment and facilities.
- There are efficient nonpolitical international organizations for the development, management, expansion and nondiscriminatory access to international telecommunications facilities and networks.
- That human well-being and understanding grow as rapidly as possible through international telecommunications services.

Strategies for pursuing these goals, NTIA said, must combine effective government organization to implement related policies developed with private-sector input. The agency called for "positive, preemptive actions" and an end to a "damage control" response to international problems. But the report also noted the U.S. often operates from a position of strength in these technological areas and suggested sometimes it is better to refrain from negotiating its policies and goals.

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Marconi's Daughter to Keynote TCA Conference in September

SAN DIEGO — Gioia Marconi Braga, daughter of the late Marchese Senatore Guglielmo Marconi, inventor of long-distance wireless communications, will keynote the Tele-Communications Association (TCA) 21st Annual Conference here Sept. 26-30.

The theme of this year's conference is "Telecommunications — Gateway to the World." Braga is expected to speak on her father's achievements in relation to today's communications technology.

Braga was awarded an honorary doctorate from Memorial University of Newfoundland and is an honorary member of the Society of Wireless Pioneers and of the Veterans' Wireless Operators Association. She is director of the Center for Italian Studies at Columbia University.

The TCA conference costs $100 for members and $500 for nonmembers. Further details are available from TCA conference headquarters at 424 S. Pima Ave., West Covina, Calif. 91790.

Census Bureau Urged to Consider Micros for '90

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Early and comprehensive planning is the key to successful large-scale systems implementation, particularly when the system will be used to conduct the 1990 decennial census, congressional auditors said recently.

The cost of that undertaking could reach $4 billion. The data processing portion of that sum is, understandably, not definite at this point, but the Capitol Hill investigators at the General Accounting Office (GAO) noted in a recent study that the 1980 census data processing expenses ran to $271 million for data collection and tabulation, both manual and automated. The data processing expenditures account for only one-fourth of the estimated $1 billion 1980 count.

While the Census Bureau is already well into the planning process for the next census, a process that includes looking at new computer and telecommunications technologies and consideration of a possible "paperless census," the GAO concluded time is quickly running out for some basic DP decisions by the bureau.

Use of Micros Urged

In particular, the GAO said in its study, requested by the House Census Subcommittee, that the bureau should consider possible use of microcomputers and commercial scanning devices in the 1990 head count. To complete the 1980 census, the bureau used scanning equipment designed and built by the agency itself and tens of thousands of clerks to collect and process 88 million questionnaires, containing 3 billion items on 226.5 million persons.

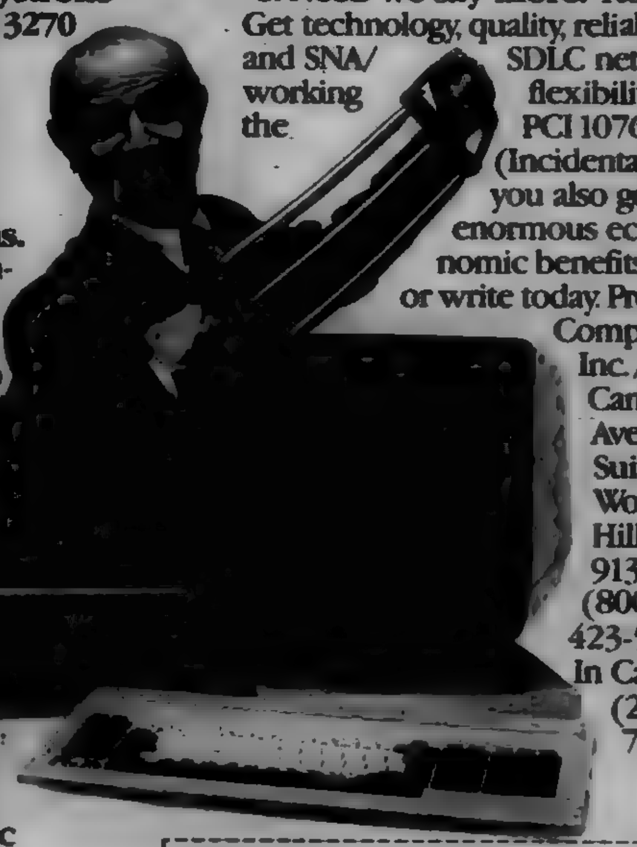
The subcommittee was concerned because completing all the planned tabulations will take as long as 3½ years from the April 1980 census date. Besides time consumed settling extensive litigation resulting from the last census' methodology, the large manual component of the count caused some of the delay, according to both GAO and the Commerce Department, the Census Bureau's parent agency.

The major thrust of planned census automation is to reduce field operations through automation and to modernize the operations of the bureau's central DP operations here. The GAO concluded that the Census Bureau has made "a good start" in its planning process but said it is worried that the bureau is not coordinating separate facets of its automation plans with the 1990 census planning.

The bureau is conducting a large-scale systems procurement to implement a fully integrated automated DP and telecommunications system for the bureaus' needs through the mid-'90s, a procurement with an estimated $98 million price tag.

The GAO report noted that the Census Bureau historically has needed four to five years to get its systems up and running, and that figure does not include prior testing and evaluating the reliability and compatibility of various types and combinations of equipment. The bureau will seek initial 1990 census planning funds for the fiscal year beginning this October.

The census agency said it is "hopeful" of automating many of the currently manual census applications. But as far as a "paperless census" — which might include more use of phone and direct phone-to-computer techniques and use of microcomputers — the bureau said, "it may not be possible to perfect such systems for the next census."



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ICL Funding Program to Develop 'New' DPer

By Bob Johnson
CW New York Bureau

NEW YORK — "The DP manager was the agent of change in the computer industry, but he has lost his way.

"A new computer professional — the 'information engineer' — will take his place and be the practitioner of technology that will lead companies into the next era of information processing."

That is the prediction of Robb Wilmott, managing director of International Computers, Ltd. (ICL), the UK's largest computer company. ICL feels so strongly about the emergence of this new type of DPer that it is providing 50% of the funding for a Master of Science degree program in the UK concentrating on information engineering. Its cosponsor is the UK Science and Engineering Research Council.

The two-year program is scheduled to begin this May with 30 students at the Kingston Polytechnic Institute. Eighteen one-week modules that combine standard DP technology with advanced management skills will be offered to prepare professionals to "understand technology as well as the benefits of technology," as ICL describes it.

ICL is concerned about the capabilities of DPers in the near future because the world is "knee-deep in information but doesn't know what to do with it," Wilmott explained in a recent interview here. Because most management information systems (MIS) and DP managers are struggling to get work out of their shops within a certain time frame, they are not really in a position to be concerned with the overall value of information and what a company can do with it.

"In the last 10 years we have gone from batch systems to on-line systems, and what was then a monthly crisis for the MIS manager has now become a daily crisis," Wilmott said.

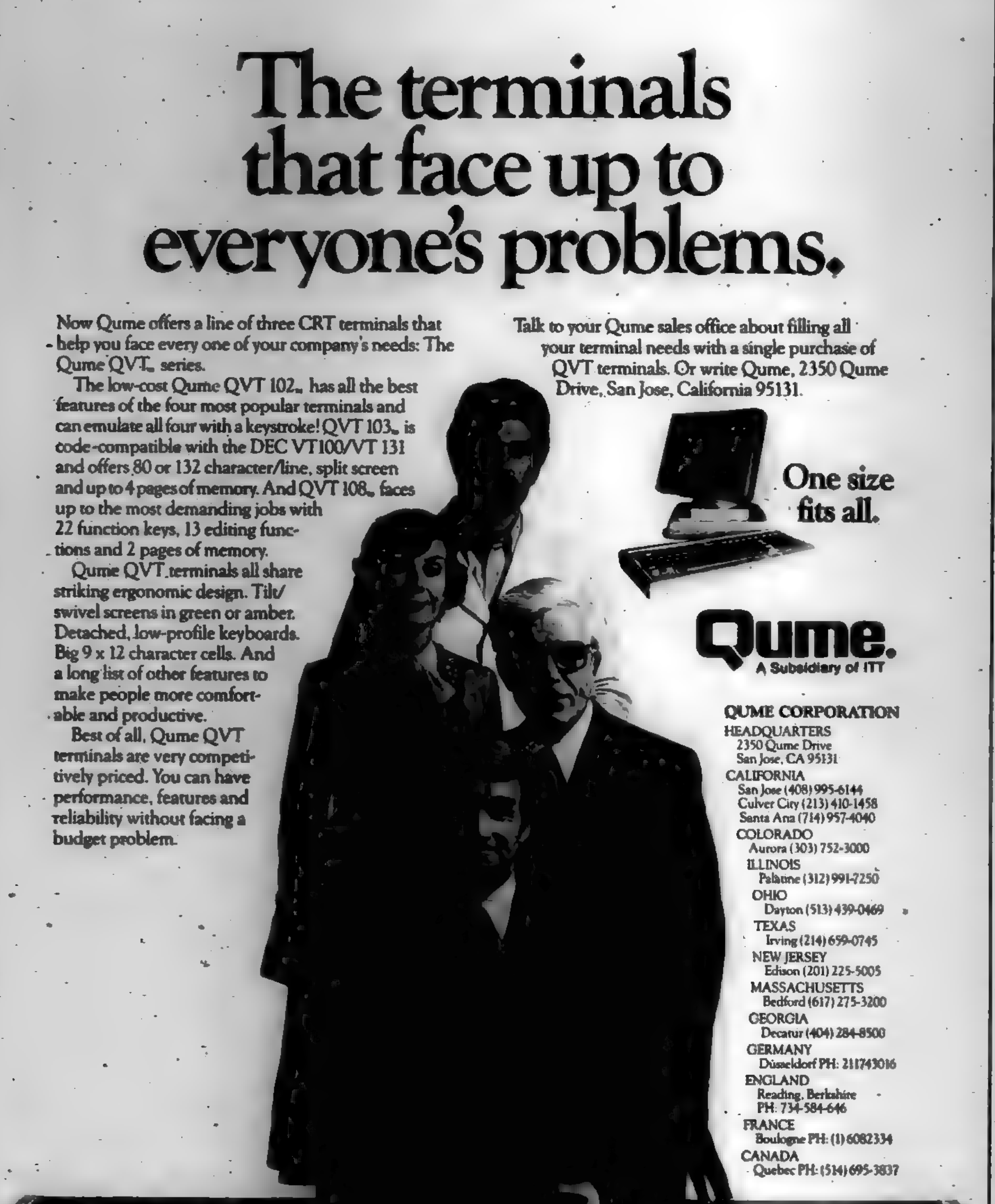
Moreover, he added, most companies today are unhappy with DP spending in relation to what they get out of it.

An information engineer — a person who understands the technology and can get the right mix of hardware, software and communications working so that information is where it is needed most — is the type of professional needed, ICL maintained. But it is just as important that this person must also be skilled in management so he can understand company goals.

"The goals of the company have got be analyzed, the flow of information must be analyzed, the capabilities and expectations of what the available technology can do for the company must be considered and how necessary changes will occur are the foremost considerations" for the information engineer, Wilmott said.

The computer industry in the future will become more dependent on competent professionals and with the escalating rate of technological advancements and corporate information needs, ICL maintained that the MIS manager in his current role will not fill the bill.

"Some DP managers will become information engineers if they adapt, otherwise they will just continue to keep the factory running. Users don't buy technology, they buy solutions," Wilmott concluded.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Non-DPers Get Training Course

SEATTLE — Boeing Computer Services Co. has released an enhanced version of its "Making It Count" videotape training program for noncomputer professionals.

The training program, which is designed to introduce people to computers, now consists of 223 transparencies and 23 half-hour videotape sessions. The additions to the program reportedly enable non-DPers to conduct the course.

The course costs $8,600 and the instructor's aid options cost $950. Boeing's Education and Training Division can be reached through P.O. Box 24346, Seattle, Wash. 98124.

Managers on the Move

Kaili Skolnik

KAILI SKOLNIK has joined Kentex Information Systems, Inc. as manager of systems planning and development in Allendale, N.J. Skolnik will be responsible for managing technical systems, as well as for directing product planning and development.

Prior to joining Kentek, Skolnik was manager of major accounts for marketing at Monroe Systems for Business and Litton Industries, Inc. Before joining Litton in 1980, she was employed by Xerox Corp. and General Electric Information Services Co.

Skolnik graduated from Lehman College in New York, with a B.S. in mathematics and received an M.S. in computer science engineering from Columbia University.

•••

ANDREW GEGOR JR. has been appointed manager of management information systems for McCormick Properties, Inc. in Hun Valley, Md. Gegor served as accounting manager since 1981 and previously was financial planner.

Before transferring to McCormick Properties, Gegor was corporate financial analyst for the parent company, McCormick & Co., Inc., in Baltimore.

Gegor graduated from the University of Maryland in 1973 with a B.S. in financial management and accounting. He also studied at Loyola College in Maryland and Price George's Community College and the University of Baltimore.

•••

STEPHEN I. POOK has been named divisional vice-president of corporate information systems, and KARLIS V. RUTINS has been appointed divisional vice-president of organization planning for American Hoechst Corp. in Somerville, N.J.

Pook joined American Hoechst in 1972 and has served as director of corporation information systems since 1979. Previously, he held other managerial positions in the financial and information systems areas.

He received a B.S. in business management from Farleigh Dickinson University, Madison, N.J.

Rutins served as divisional vice-

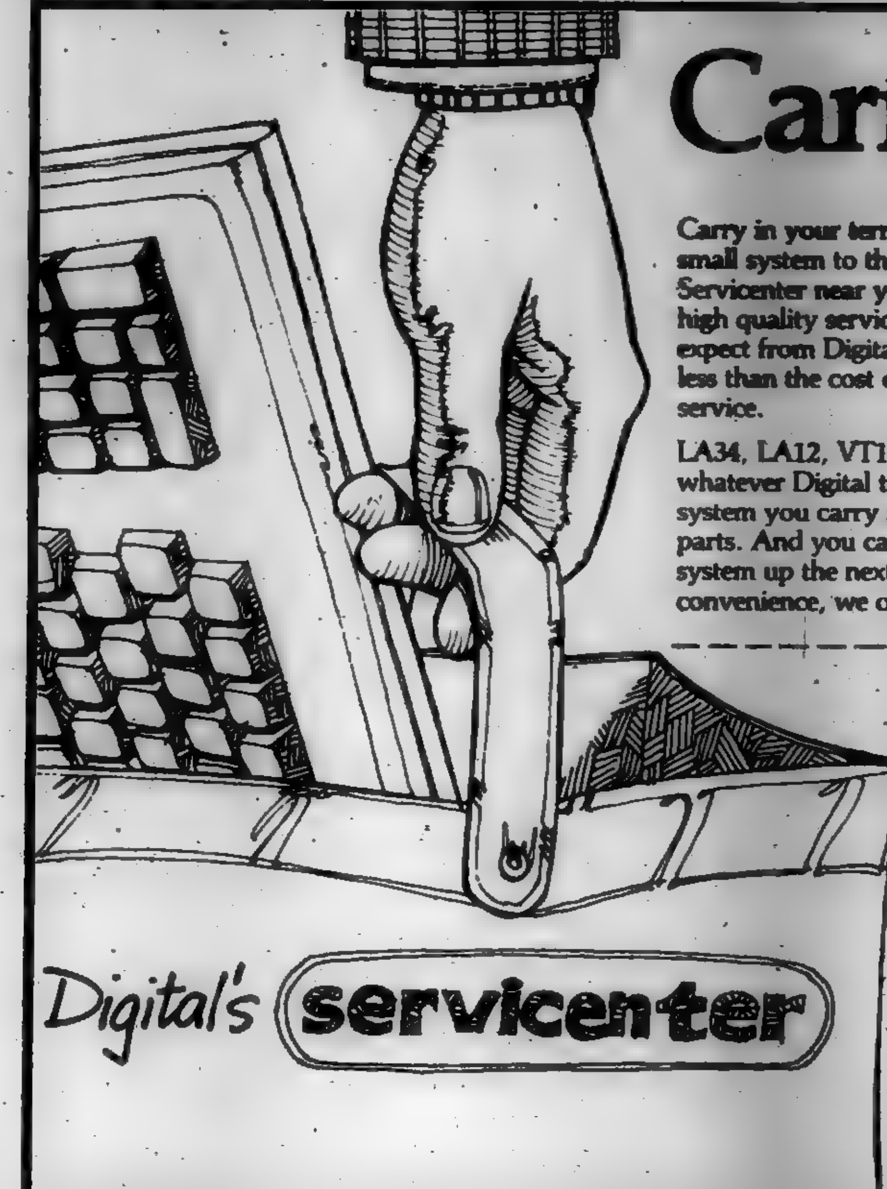
(Continued on Page 28)

Andrew Gegor Jr.

Stephen I. Pook

Karlis V. Rutins

Michael N. Thompson



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Managers on the Move

(Continued from Page 27)

president for corporation information systems since January 1980. He joined the firm in 1966 as systems manager and was promoted to director of information systems in 1971.

Rutins received a BSME from the New Jersey Institute of Technology and an M.S. in industrial engineering and management from Columbia University.

•••

MICHAEL N. THOMPSON has been appointed vice-president of information systems at the New Hampshire Insurance Co. in Manchester, N.H. The New Hampshire Insurance Group is a member of American International Group, Inc., a holding company whose insurance susidiaries engage in property, casualty, marine and life business in more than 130 jurisdictions around the world.

In his new position, Thompson will provide all systems development and data processing services for the New Hampshire Insurance Group.

Thompson joined the New Hampshire Insurance Group after serving since 1980 as director of applications development for the Domestic Brokerage Division of American International Group Data Centers, Inc. He was previously responsible for developing personal lines systems and actuarial support systems for two major insurance organizations headquartered in Philadelphia.

He attended the University of New Mexico in Albuquerque, N.M.

•••

LISA A. EISENBERG has been promoted to vice-president of administration for Bellofram Corp., a Rexnord Co. in Burlington, Mass. Eisenberg will be responsible for all administrative staff functions, including accounting, data processing and human resources.

Eisenberg was formerly vice-president of human resources. She joined Bellofram in 1976 as a personnel assistant.

Eisenberg holds a B.A. in American history and literature from Harvard University.

•••

ALAN S. FEINSTEIN and WILLIAM J. NEUSER were both named vice-presidents and senior technical consultants for Security Pacific National Bank in Los Angeles.

Feinstein joined Security Pacific in 1980 as a senior systems programmer. He holds a bachelor's degree in mathematics and a master's degree from the University of Southern California.

Neuser joined the bank in 1981 as an assistant vice-president and systems programmer. He is an alumnus of the University of California at Los Angeles.

•••

STEPHEN MILLER has been promoted to director of data processing for Nassau County, N.Y. He will direct and coordinate systems analysis and programming, technical services, operations and office automation.

Before working for Nassau County, Miller was a systems engineer for Grumman Aerospace Corp.

Miller received his bachelor's degree in aerospace engineering from Polytechnic Institute of New York and his master's in management science from C.W. Post-Long Island University.

•••

RAY KENNEDY has been named director of management systems for Quality Micro Systems (QMS) in Mobile, Ala. He will be responsible for management information systems, purchasing and product managing. He will also oversee internal coordination and communication for his department.

Prior to his promotion, he worked at First Southern Federal Savings and Loan Association in Mobile, Ala., for seven years. Before joining QMS, Kennedy was employed at Teledyne Continental Motors as credit and warranty manager for 10 years.

Kennedy is a graduate of the University of South Alabama where he received a B.S. degree in business administration.

•••

JAY ROTH has been appointed manager of data processing for ITT Industrial Credit Co.'s Automated Finance and Lease Division in St. Paul, Minn. ITT Industrial Credit Co. is a financing and leasing company.

Roth previously worked as a software support specialist for R2E of America, located in Roseville, Minn.

He received an MBA degree from the College of St. Thomas, St. Paul, and a B.S. degree in mechanical engineering from Case Western Reserve University, Cleveland, Ohio.

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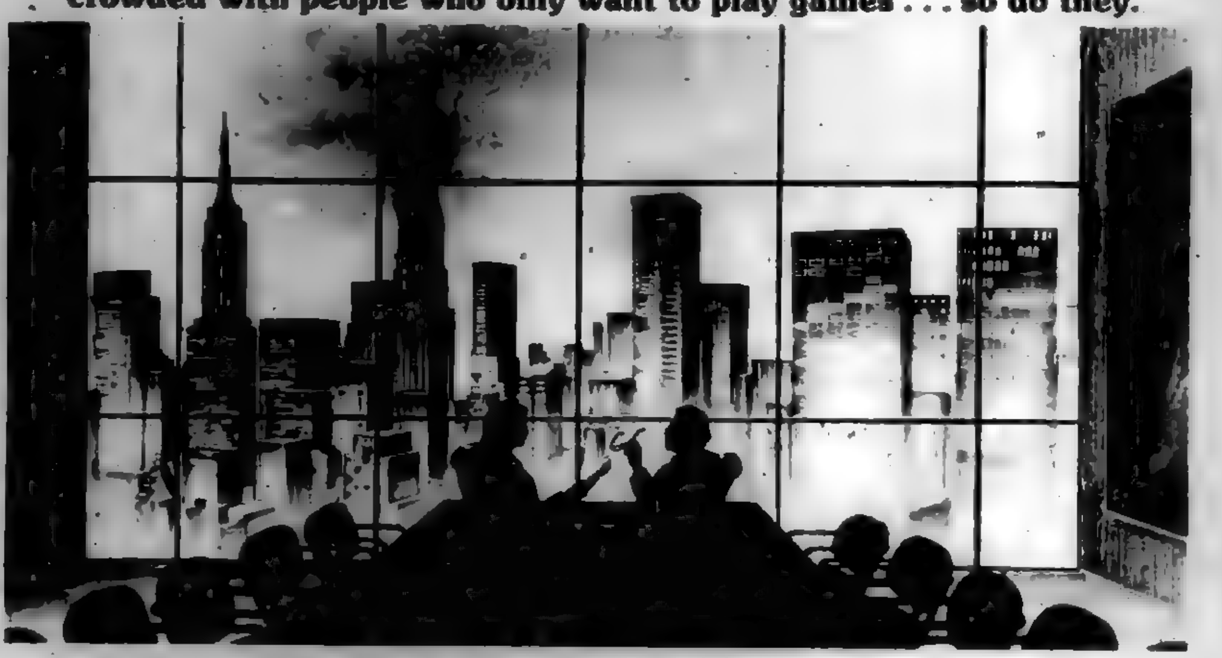

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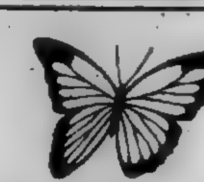

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Can Poor MIS Status Be Remedied?

Turnaround Time
By Larry E. Long

Q There have been rumors for the past several years that my boss, the director of management information systems (MIS), will be promoted to vice-president of MIS. It has not happened and I don't think it ever will.

Top management has openly voiced its displeasure with the performance of MIS. Their reluctance to promote the director indicates to me that they are not pleased with his performance. It seems as though management has accepted MIS as a necessary evil with a mediocre manager. I see no changes on the horizon.

My concern is the careers of almost 50 people. Lack of technical progress and challenge has caused these careers to stagnate. Some of our best people have already left. Would you suggest I do the same or stay put and try to improve the situation here?

A If it appears that a change of management and/or MIS emphasis will not be forthcoming within the next 18 months, then you should seek employment elsewhere. If there is a chance that you might get his job or the director will be replaced with a capable person, you might wish to stick it out.

It sounds as if top management and the director of MIS are taking a status quo approach to the information revolution. Today's MIS directors cannot just sit back and take things as they come. Successful MIS directors keep top management continuously appraised of all alternatives, even those with political implications. Mediocre managers advocate middle-of-the-road positions.

Q I am at mid-career and about to recieve my MBA. Although my experience and education (M.S.) has been in food technology, I want to move out of this low-growth arena into the high-tech field. I thought I could do this best through sales of computer equipment to the food industry, to universities or to the federal government.

As I read through the ads for salesmen, however, I am increasingly aware that my lack of knowledge of computerese and specific hardware and software products may prohibit me from reaching my goal.

I have been doing extensive market research and have identified several firms I believe could use my skills, but I am unsure how to approach them. I have a strong computer aptitude and have taught myself several languages.

Any suggestions as to how I might approach potential employers?

A Being conversant in computerese is close to the bottom of a recruiter's list of desired qualifications for a computer salesman. Recruiters are looking for someone who can make a favorable impression and have the ability to convince customers to buy their products. As far as the technical aspects of selling hardware, you need only to demonstrate an ability and willingness to learn. Most vendors have excellent training programs.

Your qualifications are superior to the majority of applicants seeking positions in hardware sales. Approach potential employers as someone with experience, education and interest in cross-training to the field of computers.

It would be counterproductive to mention your desire to sell to a specific market. Your initial market assignments will be based more on immediate needs than professional background.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*

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DPers Must Readjust Career Ideas To Succeed in Info Industry: Exec

By Bob Johnson
CW New York Bureau

NEW YORK — DPers who think of their careers only in terms of hardware and software have a very narrow idea of how they will fit into the information industry in the future, members of the Association of Women in Computing (AWC) were told here recently.

Walter P. Blass, director of strategic planning for AT&T, told a meeting of AWC's New York chapter that the traditional perception of information processing and distribution must be adjusted by computer professionals if they plan to succeed in the field.

Blass noted that DP, telephony and publishing are beginning to blend together and that hard distinctions between the fields are disappearing. "The information business is becoming dependent on technologies which will be directly related to each other," he said.

Companies like AT&T and IBM are beginning to overlap in certain areas of information, Blass commented. He said that since the recent divestiture of the AT&T operating companies, the company is moving toward becoming a "conduit" type of information provider, one which supplies the means of communicating data. IBM is also moving into this area, and both major industry forces are good examples of the changing nature of computer and information company plans. Blass pointed out that computer professionals should look at these moves as signposts to guide them in their aspirations.

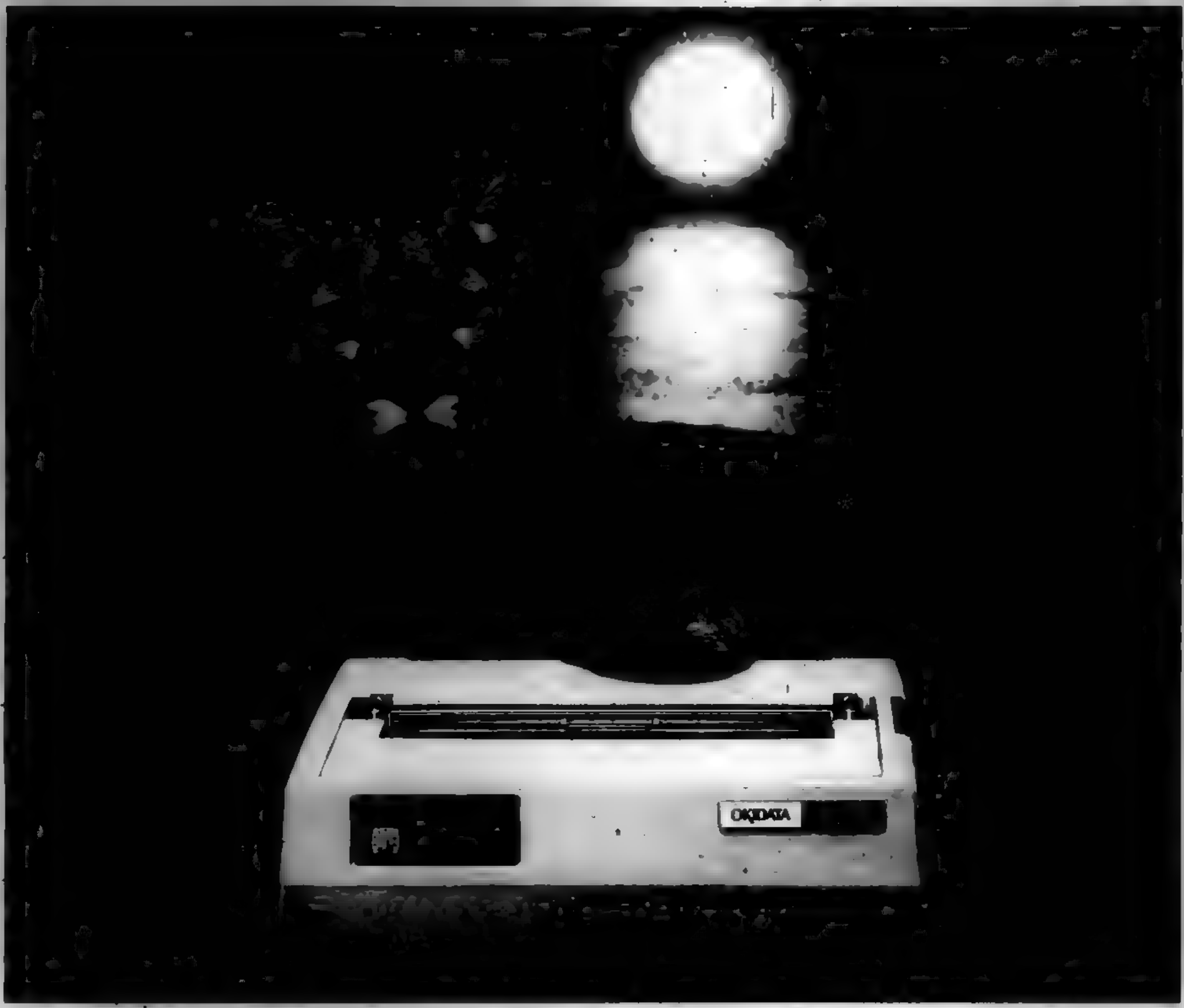
OA Revolutionized

"For example, areas such as office automation will be revolutionized within the next 10 to 15 years. Telecommunications will be the next big invader into this area — bringing with it a merger of office automation and DP. I/O devices, voice and even optical-image recognition will gradually emerge and erode rows and rows of staff positions," he commented.

Blass told the AWC that such industries as communications and artificial intelligence, which are now moving into information processing, are the ones DPers should be interested in. He used the typical factory floor as an analogy to illustrate his point. "Tasks such as monitoring factory equipment — which used to take 50 men to do — are now monitored by one man looking at multiple CRT screens. It will not be too long before artificial intelligence is applied so perhaps even that one man is not needed."

Although Blass could not give specific areas, subjects or disciplines that the DPer should follow to keep up with the times, he did emphasize that goals and capabilities be kept in mind.

He said that although it is true that the technologies will change, it does not mean the DPer has to pursue a technological goal. As information becomes more and more user-driven, managerial skills will become increasingly important. If that is where the DPer's strengths lie, steps should be taken to formulate a career plan in that direction.



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ICCP Hands Out Awards To Top CDP Exam Scorers

CHICAGO — The Institute for Certification of Computer Professionals (ICCP) has given Awards of Excellence to the top ten scorers in the 1982 Certificate in Data Processing (CDP) examination.

The awards are presented annually to the highest aggregate scorer and to the top scorers in each of the five sections of the examination. A total of 3,914 candidates sat for the test in May 1982 and slightly more than one-third (1,427) passed.

Award of Excellence winners include the following::

- Nation's Top Scorer: Michael R. Heath, Creve Coeur, Mo., employed by Ramsey Corp., St. Louis. Heath also tied with two others as top scorer in Section 2 Programming and Software. ICCP will present a $500 scholarship in Heath's name to the college of his choice.
- Section 1, Data Processing Equipment: Joel N. Weisberg, Monsey, N.Y., employed by Price Computer, Inc., Mountainside, N.J.
- Section 2, Programming and Software: Three-way tie among Heath; Paul F. Almquist, Eau Claire, Wis., employed by District 1 Technical Institute, Eau Claire; and Daniel Urban, Hollidaysburg, Pa., employed by Butterick Fashion Marketing, Altoona, Pa.
- Section 3, Principles of Management: Three-way tie among Gregor C. Avison, Bellevue, Wash., employed by Peat Marwick Mitchell & Co., Seattle; Nicholas G. Boyaris, Chicago, employed by Allstate Insurance Co., Northbrook, Ill.; and Robert Schaich, Rocky Hill, Conn., employed by Aetna Life & Casualty Co., Hartford, Conn.
- Section 4, Quantitative Methods: Tie between Robyn L. Birckhead, Hyattsville, Md., employed by Peat Marwick Mitchell & Co., Washington, D.C.; and Miriam H. David, San Diego, Calif., employed by Steres, Alpert & Carne, San Diego.
- Section 5, Systems Analysis and Design: David C. Kapell, Syracuse, N.Y., employed by P&C Food Markets, Syracuse.

The next CDP exam will be given May 7. More information is available from the ICCP, Suite 1752, 35 E. Wacker Drive, Chicago, Ill. 60601.

Campbell Elected President of ICCP

CHICAGO — Robert P. Campbell, president of Advanced Information Management, Inc. of Woodbridge, Va., was recently elected president of the Institute for Certification of Computer Professionals (ICCP).

Campbell is former chairman of the Computer Crime Information Conference.

In addition, he serves as national director of the Association of Computer Programmers and Analysts.

Audit, Control Meet Set for May 9

CHICAGO — "New Vistas in Information Systems Audit, Control and Security" is the theme of the 13th Conference on Computer Audit, Control and Security slated to take place here May 9-13. The conference will be sponsored by the EDP Auditors Foundation.

With 96 presentations and 13 two-day courses, the meeting focus on systems posing the greatest control problems, according to its sponsor. The multitracked program is aimed at audit managers, security professionals, systems designers and quality assurrance personnel, in addition to data processing auditors.

The conference costs $795. Further details may be obtained from the EDP Auditors Foundation's Education Department, P.O. Box 2051, Winter Park, Fla. 32789.

ICCP Publication Discounted

CHICAGO — "Systems Analysis and Design: A Foundation for the 1980s" has recently been made available at a discounted price from the Institute for Certification of Computer Professionals (ICCP).

The 553-page publication is a compilation of past ICCP proceedings. It includes 34 papers on current practices of system analysts and designers throughout the industry.

The text now costs $29, down from $67.50 from ICCP, 35 E. Wacker Drive, Chicago, Ill. 60601.

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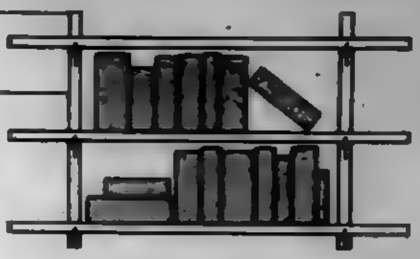
Off the Press



This month's 'Off the Press' is devoted to microcomputers in the business environment. The books are grouped into functional areas and since each title is self-explanatory, descriptions are brief.

For those who want more information on this latest data processing frontier, Computerworld's *Special Report this month, appearing in the March 28 issue, will focus on micros in business.*

General Introductory Books

MICROCOMPUTERS IN LARGE ORGANIZATIONS

By Thomas William Madron

Madron shows how to implement microcomputers in a planned, organized manner, including the manager's workstation, word processing, data collection, planning and modeling, statistical analysis and data communications. Glossary, index.

Softcover, 182 pages, ISBN 0-13-580787-5, $12.95. Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632.

MASTERING MICROS

By Hannah I. Blank

This book wisely devotes just five pages to what a computer is, then jumps right into problem solving, identifying needs, capacity planning and software and hardware selection. A thoughtful, succinct book for managers.

Hardcover, 303 pages, ISBN unavailable, $24.95. Petrocelli Books, Inc., 1101 State Road, Princeton, N.J. 08540.

HOW TO MANAGE YOUR SMALL COMPUTER . . . WITHOUT FRUSTRATION

By Hillel Segal and Jesse Berst

This is a real how-to book, covering installation, maintenance, crime proofing and disaster planning. It also covers managing the people who will use the microcomputer and concludes with a useful section on getting more out of your micro. The authors' disk backup system is an oustanding feature, as are the many work sheets.

Softcover, 246 pages, ISBN 0-13-423665-3, $14.95. Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632.

MICROCOMPUTER DATA COMMUNICATIONS SYSTEMS

By Frank J. Derfler

A basic, no-nonsense primer on microcomputer communications, from terminals to modems to information utilities, from a communications manager with the Department of Defense.

Hardcover, 129 pages, ISBN 0-13-580720-4, $17.95. Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632.

WRITING IN THE COMPUTER AGE

By Andrew Fluegelman And Jeremy Joan Hewes

This book is for writers — journalists, business people or casual correspondents. It explains word processing hardware, software and techniques, but it also delves into writing, editing and organizing styles and strategies.

Softcover, 254 pages, ISBN 0-385-18125-6, $10.95. A Doubleday Anchor Book, 245 Park Ave., New York, N.Y. 10167.

Hardware

The following books augment the documentation which comes with the microcomputer by clarifying techniques and offering tips from more experienced users — such as the author. Many publishers offer these machine-specific books; herewith a sampling from publishers active in this subject area.

THE TRS-80 MODEL III USER'S GUIDE

By Tony Bove and Leroy Finkel

Softcover, 252 pages, ISBN 0-471-86242-8, $12.95. John Wiley & Sons, 605 Third Ave., New York, N.Y. 10158.

(Continued on Page 34)

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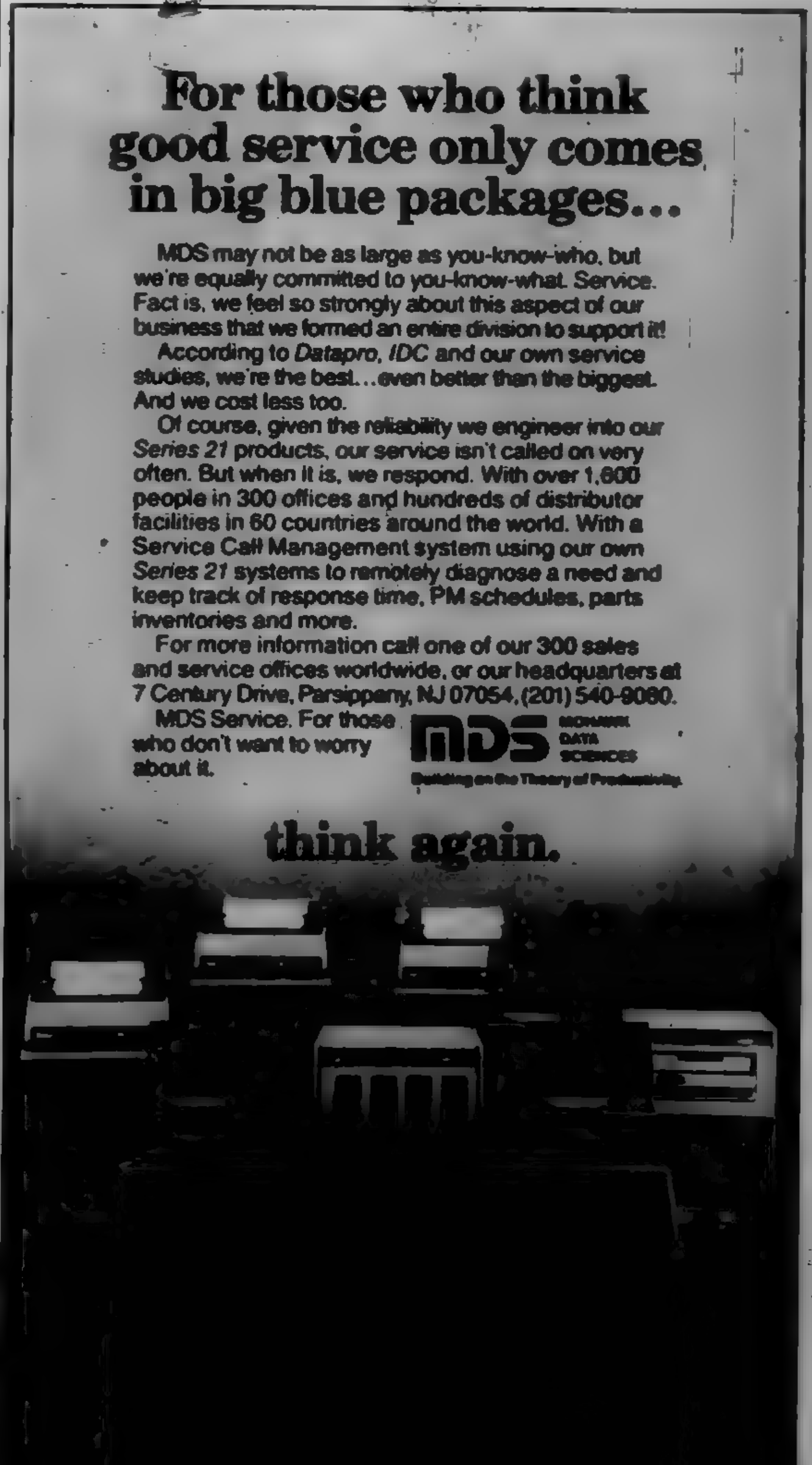

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Off the Press

(Continued from Page 33)

THE APPLE II USER'S GUIDE

By Lon Poole

Softcover, 388 pages, ISBN 0-931988-46-2, $16.95. Osborne-McGraw-Hill, 2600 10 St., Berkeley, Calif. 94710.

USING THE OSBORNE-1 COMPUTER

By T.G. Lewis

Hardcover, 211 pages, ISBN 0-8359-8142-8, $30. Reston Publishing Co., 11480 Sunset Hills Road, Reston, Va. 22090.

If you have a video tape recorder, you may be interested in **HOW TO USE YOUR IBM PERSONAL COMPUTER IN 10 EASY VIDEO LESSONS** or **HOW TO USE YOUR APPLE II IN 10 EASY VIDEO LESSONS.** The IBM tape runs over two hours; the Apple tape runs one hour and 45 minutes. Both are available in VHS or Beta format at $120. The tapes are created and produced by Kennen Publishing and distributed by Stoneware, Inc., 50 Belveder St., San Rafael, Calif. 94901.

Software

THE SOFTWARE RESOURCE BOOK FOR PERSONAL COMPUTER USERS

Edited by Kimberly Perry Leonsis

This is a new directory that contains articles and an extensive index listing over 3,000 business and professional software programs for microcomputers. It includes what machines or operating systems the software runs on, price (when supplied) and company particulars.

Softcover, 400 pages, $12.50. Redgate Publishing Co., 3407 Ocean Drive, Vero Beach, Fla. 32960.

INFOWORLD REPORT CARD: EXPERTS EVALUATE MICROCOMPUTER SOFTWARE

Edited by Scott Mace

This is a collection of *InfoWorld* newspaper's software reviews, categorized by machine or as running on Digital Research, Inc. CP/M computers. It includes system requirements, price and company particulars.

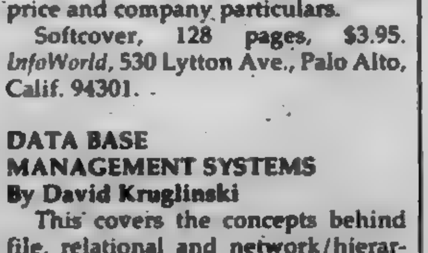
Softcover, 128 pages, $3.95. *InfoWorld*, 530 Lytton Ave., Palo Alto, Calif. 94301.

DATA BASE MANAGEMENT SYSTEMS

By David Kruglinski

This covers the concepts behind file, relational and network/hierarchical data base management systems and discusses in detail the current DBMS packages, as well as associated software, for microcomputers.

Softcover, 260 pages, ISBN 0-931988-84-5, $16.95. Osborne/McGraw-Hill, 2600 10th St., Berkeley, Calif. 94710.



'Data In Depth.'

Softcover, 260 pages, ISBN 0-931988-84-5, $16.95. Osborne/McGraw-Hill, 2600 10th St., Berkeley, Calif. 94710.

AN INTRODUCTION TO VISICALC MATRIXING FOR APPLE AND IBM

By Harry Anbarlian

This book helps you create reusable matrices that extend Visicorp's Visicalc usefulness beyond normal spreadsheet functions. A few examples are credit card records, T-bill investments, zero-base budgeting and organizational charts.

Softcover, 252 pages, ISBN 0-07-001605-4, $22.95 McGraw-Hill Book Co., 1221 Ave. of the Americas, New York, N.Y. 10020.

HOW TO USE SUPERCALC

By Deborah Willis, Jerry Willis And Merl K. Miller

This book walks the reader step-by-step through one of the most popular spreadsheet packages. It is also a reference manual for program functions. Work sheets used as examples in the text are available on diskette.

Softcover, 102 pages, ISBN 0-88056-095-9, $19.95. Dilithium Press, P.O. Box 606, Beaverton, Ore. 97075.

OSBORNE CP/M USER GUIDE, Second Edition

By Thom Hogan

This is a complete primer on CP/M and CP/M-86 (16-bit), which covers commands, utility programs, reference lists and how to implement CP/M. An all-in-one reference.

Softcover, 292 pages, ISBN 0-931988-82-9, $15.95 Osborne-McGraw-Hill, 2600 10 St., Berkeley, Calif. 94710.

INTRODUCTION TO BASIC PROGRAMMING

By Gary B. Shelly And Thomas J. Cashman

While there are many books on Basic programming, this one is unique in its extensive classroom use and for the fact that it contains over 500 color illustrations. Functional and eye pleasing as well.

Softcover, approximately 400 pages, ISBN 0-88236-118-X, $14.95. Anaheim Publishing Co., 2632 Saturn St., Brea, Calif. 92621.

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Three-Person DP Staff Backs $21 Million Firm

EL CAJON, Calif. — How large a staff does it take to run the data processing center for a $21 million, 410-employee company?

Only three, according to DP specialist Robert Wilson of Chem-Tronics, Inc., a manufacturer of engine components for the aerospace industry.

The three programmer/analysts at Chem-Tronics have been neither overworked nor backlogged with requests since the department installed a Cobol program generator in October 1981. The generator has cut applications development time up to 200%, Wilson said.

"We do virtually all our screen and report formatting" with Bytek, Inc.'s Cogen generator, "together with file definitions and other more mundane tasks," Wilson explained. "In fact, only about 20% of the code we produce is still written by hand."

Chem-Tronics uses a 1.5M-byte NCR Corp. I-9050 computer with 30 terminals and three printers. Much of the data handling is done by IMCS II, an NCR package that includes modules for inventory, bill of materials, routing, work in progress and a status module for general accounting, payroll, accounts receivable and accounts payable.

Fills Gap

Wilson said that Cogen fills a gap between the NCR package's capabilities and the corporation's special needs. "The information we require already resides in the data base," he said, "but we often need to sort, format or display it in a different manner. In a sense, we use the generator as a querying system."

Written in RM/Cobol, Cogen allows programmers to paint screen displays and output formats. Reports can be developed using optional headers, multiple detail lines and control breaks, conditional detail line printing, selected data from reference files and flexible page size and spacing, a spokesman said.

A project recently completed by Wilson tracks standard labor hours (the amount of time that is anticipated in manufacturing a given part) by department on all Chem-Tronics final assembly products.

Wilson used Cogen to access the indexed item master file containing all part and assembly level numbers. He then positioned the pointers in the bill of materials file. He also placed pointers from the master file to the routing file, which contained the production path for each part through the company's 100 work centers, as well as the time required at each stop.

After the pointers were established, Cogen was used to read the files and obtain the data, Wilson said. He manually wrote the code necessary to do the final computations.

"The generator writes all the selects, record contains, picture clauses and the rudimentary procedures itself," Wilson said. "The remaining 20% you're left with is not only the most technical but the most interesting."

Chem-Tronics also uses Cogen to develop applications that are independent of the IMCS II and accounting packages, Wilson said. One query and report system developed for the company's aviation repair section took four weeks to finish. Wilson estimated that without Cogen, the job would have required three to four months.

Furthermore, Wilson said, the generator has allowed the DP department to remain small and responsive to users. "We are vertically oriented, with each member having an area of responsibility and a single programmer overseeing a project from start to finish," he said. "It's a much more satisfying arrangement."

Finally, Wilson noted that the generator imposes a programming standard on the entire shop. Cogen prefixes are uniform, which means "you don't have to worry about programmer personalities," he stated. "The generator imposes a good de facto standard, and any one of us can pick up our colleagues' work and immediately follow the flow."

Meet to Center On Learning

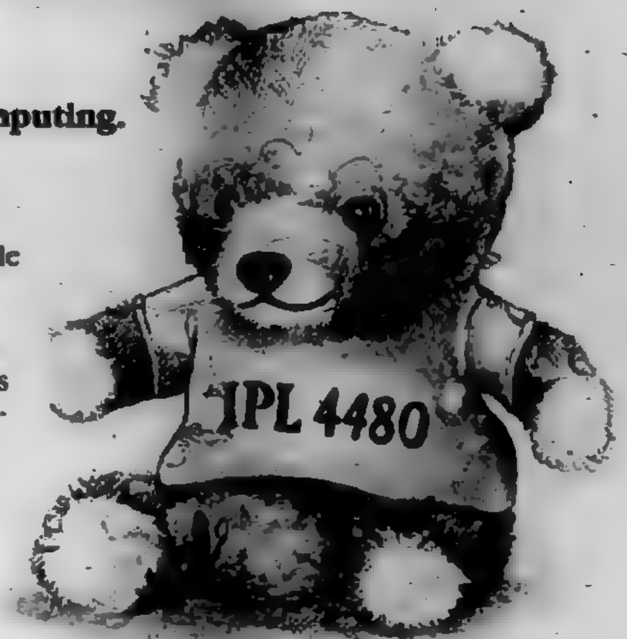
WINNIPEG, Man. — "Computer Technologies for Productive Learning" is the theme for the Fourth Canadian Symposium on Instructional Technology to be held Oct. 19-21 at the Westin Hotel here.

Sponsored by the Associate Committee on Instructional Technology of the National Research Council of Canada, the symposium is intended to inform the academic and business communities of recent advances in computer-aided learning technology and applications.

Topics to be addressed will include computer awareness and literacy in schools and society, computer aids for the handicapped, productivity improvement methods and systems technology.

The registration fee is $110 if paid before August 31 and $140 after that date.

Further information is available from Conference Services Office, National Research Council of Canada, Ottawa, Ont., Canada K1A 0R6.



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Communications Package Helps Textile Firm Weave Efficient Net

VALDESE, N.C. — Communications software is helping a textile manufacturer here weave its order processing network into an efficient unit.

Alba-Waldensian, Inc., a $50 million textile manufacturer that specializes in casual wear for women, men's socks, hose, dance and exercise apparel and knit suiting fabric, had relied on the U.S. Postal Service to carry orders from three major clients to its central offices and warehouse. But the process proved too time-consuming for a business that relies on high volume for its livelihood.

For example, it took about five days for batch orders from K-Mart Corp. in Detroit to reach the company. Another three days were consumed keying the orders into Alba-Waldensian's IBM 370/145 mainframe.

Similar times were recorded for J.C. Penney Co., Inc. and Sears Roebuck & Co. Together, the three retail chains provide about 40% of Alba-Waldensian's business.

"We had to get into an environment where we could receive orders from our main customers by teleprocessing — for economy's sake if nothing else," recalled Grady Zimmerman, Alba-Waldensian's DP manager.

Zimmerman heard about SMM/Tracs, a communications package offered through Software Module Marketing of Sacramento, Calif. Zimmerman was already familiar with the work of Dave Matthews, the software's developer. Without evaluating other systems, Alba-Waldensian signed on with SMM/Tracs last May. The package utilizes an IBM 3704 communications controller and a modem.

The DP department had the package tested within two hours of installation and up and running within four days, Zimmerman said. Now, the 80,000 annual orders from the three customers are received and processed entirely in batch.

Keying Times Eliminated

"With SMM/Tracs, the orders come in around 11 a.m. and are out in the mills for picking and packing by the next morning," he said. "We have also eliminated all keying times." Zimmerman said the package has enabled the company to reduce its order processing time by 500% and has eliminated errors caused by rekeying.

Zimmerman's staff was pleased by the ease of installation features of SMM/Tracs. "With no experience at all in teleprocessing, we have been able to walk in and talk to our customers, who are using some of the most sophisticated approaches in the business, with no problems."

Because the package can communicate with nearly any computer using batch bisynchronous communications, "it has opened up networking possibilities within individual stores," he said. Alba-Waldensian has already hooked in with Sears' retail network. Sears sends in order inquiries, which Alba-Waldensian processes. Responses are sent back to Sears over data communications lines and transmitted by Sears to the local stores.

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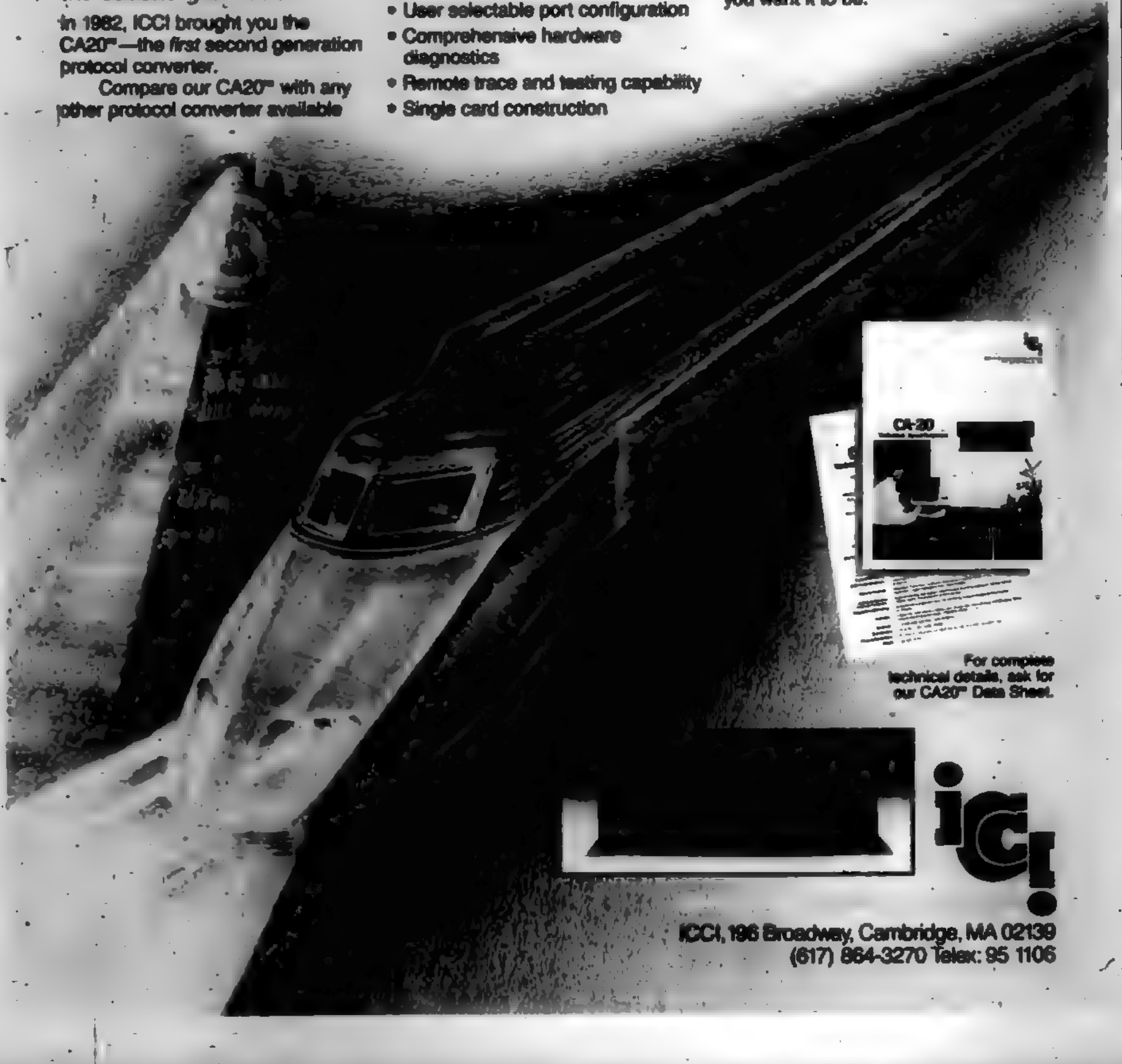

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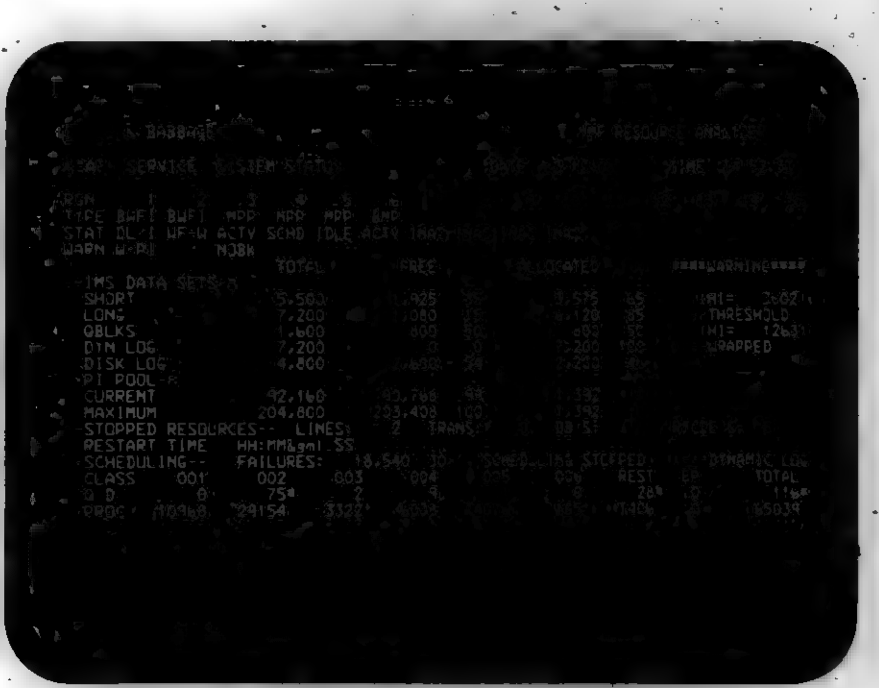
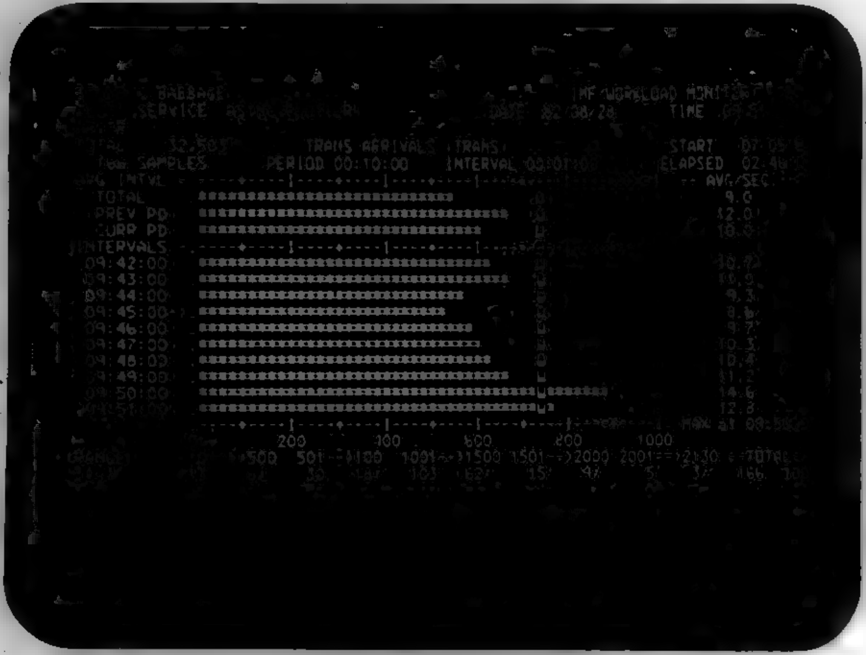
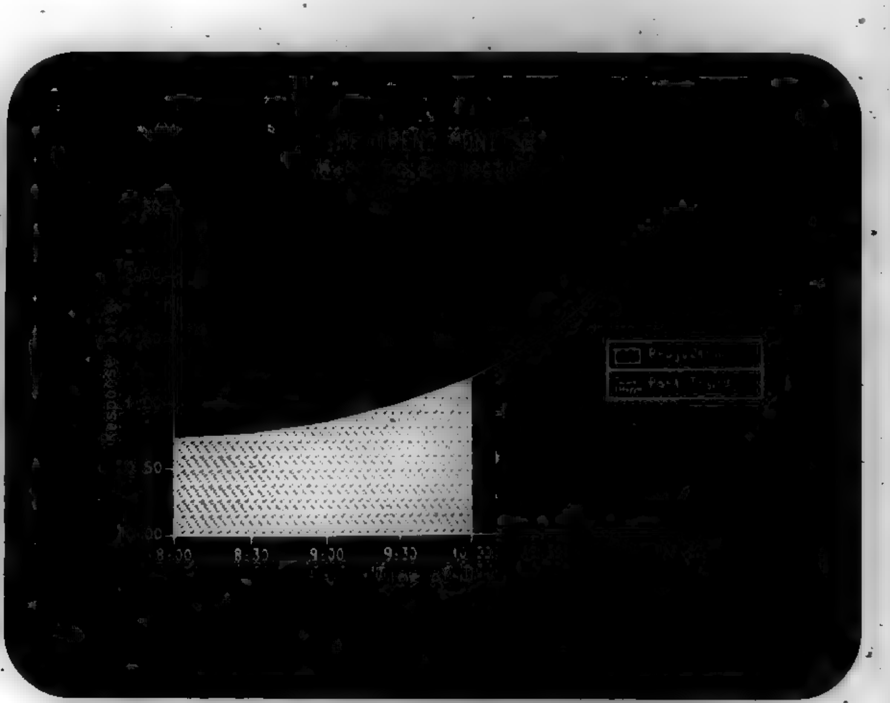


IMF/RESOURCE ANALYZER™ provides a window into IMS, showing you the full panorama of status and activity, *including* IMS Fast Path.

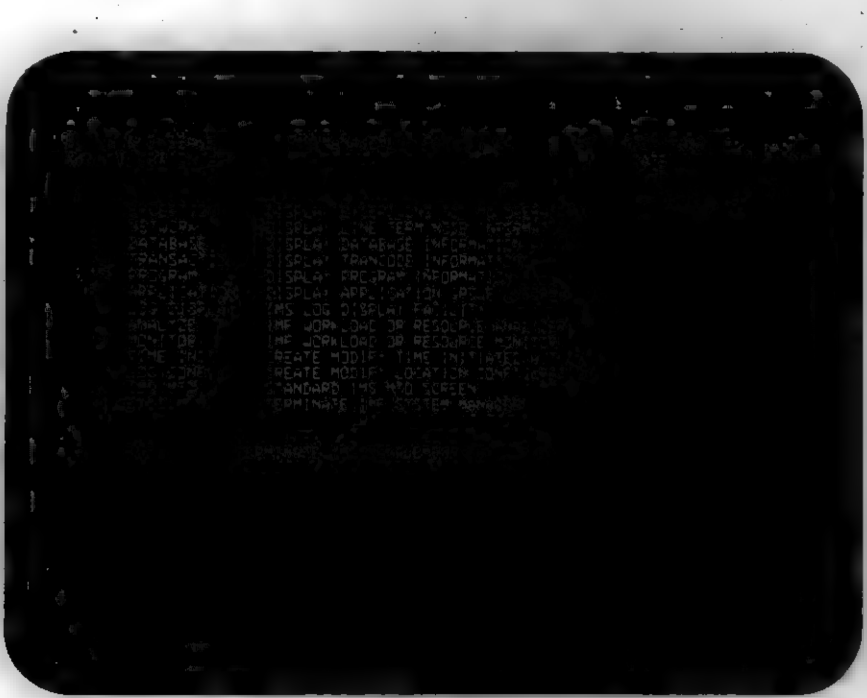


IMF/WORKLOAD MONITOR™ and **IMF/RESOURCE MONITOR™** provide over 100 services to track IMS activity, and to graphically show you how any monitored activity is behaving over time.



IMF/TREND MONITOR™ gives you advance warning of probable or impending IMS problems, so corrective action may be taken *before* user service is affected!

IMF/SYSTEM EVALUATOR™ assesses the status of your IMS system, using the continuous input from IMF/WORKLOAD MONITOR and IMF/RESOURCE MONITOR, and proposes corrective action for any revealed IMS performance problems.



IMF/SYSTEM MANAGER™ provides a high-level, menu-oriented IMS operator interface for increased MTO productivity; automatically performs routine operations; and implements the corrective actions proposed by the IMF/SYSTEM EVALUATOR.

PRESENTING THE TOTAL PICTURE OF IMS PERFORMANCE.

Boole & Babbage introduces IMS MANAGEMENT FACILITIES (IMF)™, the first integrated, comprehensive IMS management architecture. On-line, IMF gives you the capability to govern all aspects of realtime IMS operations, from critical bottleneck identification to automatic problem resolution. Off-line, IMF provides documentation of system performance, billing and accounting, and planning for future needs.

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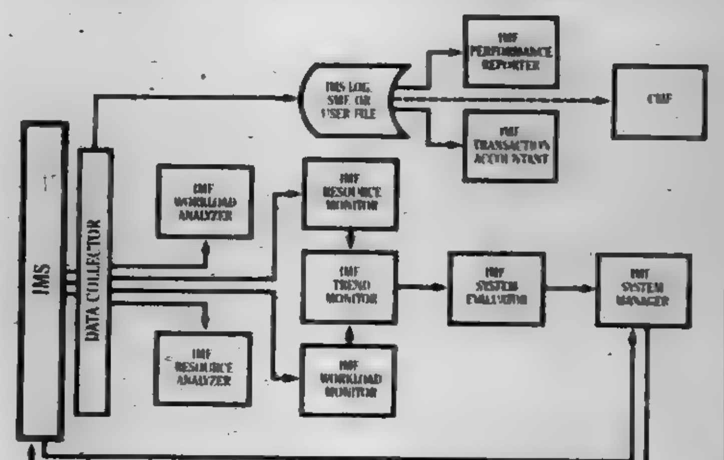

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Almond Growers Find Time Ripe for WP System

SACRAMENTO, Calif. — Ask any member of the 5,000-member California Almond Growers Exchange to describe the exchange's computer system in one word and that word might be "consolidation." The Exchange recently provided uniform access to its central library, saved typesetting costs and freed disk space when it consolidated its word processing needs around a single vendor.

Producing miscellaneous correspondence, generating reports, communicating with farmers and markets and tracking production required more modern methodology than the typewriter could provide, so individual departments within the exchange installed a variety of word processors. But, according to Stan Deam, director of technical services, this did not prove to be a satisfactory arrangement.

"There was a demand for additional word processors," he said. "And the company felt we should do something on a corporate basis rather than continue adding vendors and having separate maintenance agreements. We wanted a system that would let everybody communicate to a central library."

Prior to purchasing a system, the exchange conducted a survey to determine the number of hours each person felt he had spent in performing a particular job. A committee was subsequently formed and spent six months checking out various equipment, finally narrowing the choice to three vendors: Lanier Business Products, Inc., A.M. Jacquard and Wang Laboratories, Inc.

Easy to Learn

"We went with Wang because it's such an easy system to learn," Deam reported. "And we liked the glossary feature. But probably the deciding factor was that we wanted a system that we could put a lot more devices on. We could expand it. Some of the other systems were limited in the number of workstations."

The exchange installed the Wang OIS 140 with 10 workstations and seven printers. They are used by the communications department, the president's office, plant production, data processing, gift pack office and marketing.

The exchange produces a number of publications. The communications department enters all magazine copy on the Wang system and sends the disk to a local printer, where it is converted to typeset copy. This new process eliminates the need for a professional typesetter, saves time and reduces overall production costs.

The exchange is using Wang's basic word processing package. "With the Wang word processor, we have a dedicated software package that is doing one job," Deam said. "We are not running it as a data processor, although the software is available to do that, too."

Deam is particularly happy with the archival system that Wang provides. "To prevent using all the available disk spaces, we remove documents that are not required for maybe six months or a year," he said. "At some time we may want them again, but we don't know when. So we can clear them out of the libraries, and that disk space can be reused.

"It's an ideal method for reserving disk space. The way the Wang software is set up, we just give each of the libraries a name or a code and we can retrieve what we want. If one of the operators needs a document, he or she sends us a form, we load that back into the library maintained for that department and they have it."

The exchange's word processing system is used by two groups: the data processing people who handle the disk backup and archiving and the personnel at various other departments who use the system. If one of the users has a question, the DP department assists him. When necessary, the DP department calls the Wang office here for assistance.

Deam feels the Wang integrated system is working extremely well for the California Almond Growers Exchange. "I like the concept of having a single system for the entire company," he stated. "When we buy additional word processors, they will be Wang models that can tie into this system."

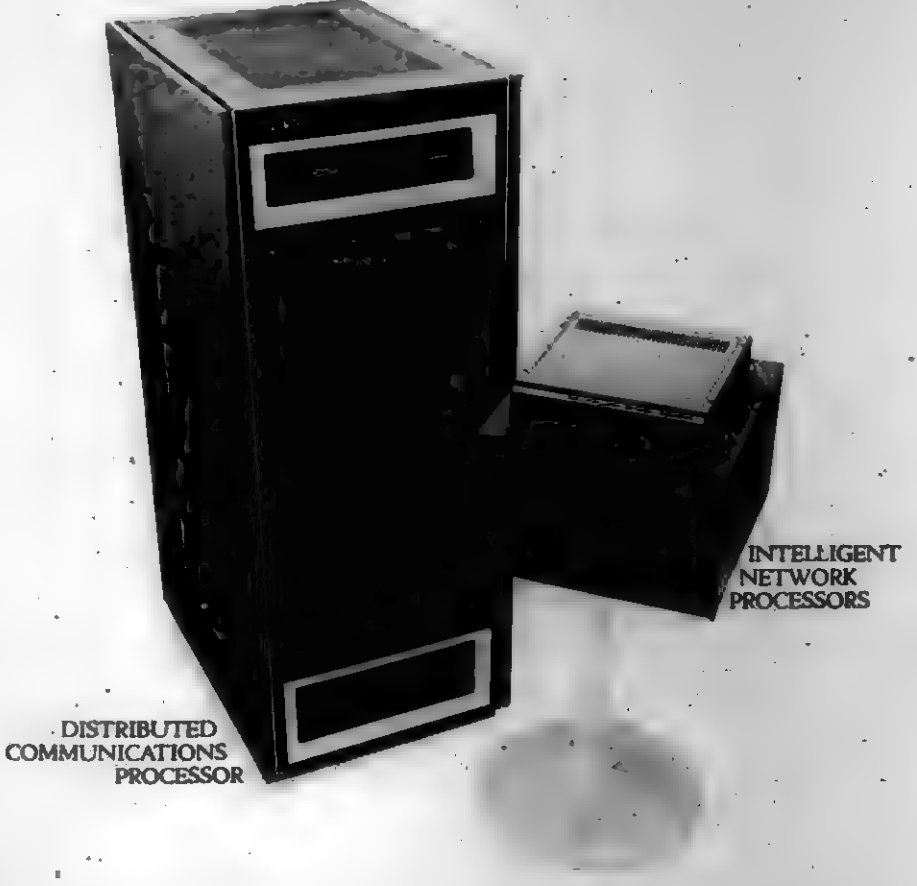
MJCC Meeting Set for May 11

BLOOMINGTON, Minn. — The fith annual Minnesota Joint Computer Conference (MJCC) is slated to take place here May 11-12. The event is being cosponsored by the Association for Computing Machinery, the Association for Systems Management and the Data Processing Management Association.

The theme of the conference is "Strategies for the New Wave." Sessions will concentrate on management techniques, personal growth strategies, technological strategies and evolutionary strategies, according to show sponsors. Keynoting the meeting will be the director of educational programming at ITT, Thomas D. Lutz.

Registration for the conference is $215. Further details may be obtained from MJCC headquarters through P.O. Box 9544, Minneapolis, Minn. 55440.

OH WHAT A
YOU WEAVE.



Sponsored by IACSS, Data Security Workshops

Data Security Workshop Slated March 28

WASHINGTON, D.C. — The 51st International Operations Data Security Workshop will be held here March 28-31. The workshop will be sponsored by the International Association for Computer Systems Security, Inc. (IACSS) and Data Security Workshops, Inc.

Nineteen sessions will cover a range of technical and administrative controls dealing with the security problems of distributed processing, computer facilities support, communications security, personnel controls, backup and recovery contingency planning, logical and physical access controls of programs and data, establishing auditable operation controls and risk analysis.

In addition, details of the two-part Computer Systems Security Professional certification program and the establishment of a Capital Region Chapter of the IACSS will be highlighted.

The workshop costs $775 for IACSS members and $825 for nonmembers.

More information is available from IACSS at 6 Swarthmore Lane, Dix Hills, N.Y. 11746.

Independent Service Firms Profiled

PALMYRA, N.J. — Service Research Group has published the "Handbook of Independent Service Companies," containing profiles of over 250 independent service companies and providing guidelines for evaluation and selection.

Information provided includes staff and revenue size, businesses served, equipment serviced, software and communications capabilities, geographic coverage and contract terms and rates, a spokesman said. The book also features a geographic/service index.

The handbook costs $1,500 from Service Research Group, P.O. Box 335, Palmyra, N.J. 08065.

Spring Seminars Set to Discuss Net Protocols

MADISON, N.J. — The American Institute for Professional Education here is presenting a three-day seminar on "Network Protocols" in San Francisco, March 23-25; Rochester, N.Y., April 6-8; Boston, April 13-15; Minneapolis, April 20-22; Detroit, April 27-29; and Dallas, May 4-6.

Covered will be "Communication Network Fundamentals," "Communications Standards" and "the ISO [International Standards Organization] Reference Model."

Registration costs $765, with a 10% discount for three or more registrations made concurrently by the same firm. The institute is located at the Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

DPMA to Hold AI Conference

TORRANCE, Calif. — The Education Foundation of the Data Processing Management Association (DPMA) is sponsoring a conference on artificial intelligence (AI) in Boston, April 14-15 and then in Washington, D.C., April 28-29.

The conference is intended for aerospace and electronics companies that will be affected by the AI revolution, according to a DPMA spokesman. Areas to be covered during the two-day event include the hardware/software technologies and architectural techniques involved in AI, the Department of Defense's current activities and future plans for AI, how industry can participate, the status of Japan's fifth-generation computer project and ways in which a practical AI project can be implemented.

Registration for the AI conference is $475. Further details can be obtained from the Education Foundation of the DPMA, Department AI, 3420 Kashiva St., P.O. Box 3608, Torrance, Calif. 90510.

AI Focus of Forum For August Meet

WASHINGTON, D.C. — Artifical intelligence will be the focus of a week-long meeting here August 22-26. It is being jointly sponsored by the American Association for Artificial Intelligence (AAAI), the University of Maryland and George Washington University.

Computer scientists, linguists and related researchers will assemble at this forum to present their views and findings on the subject of artifical intelligence. A concurrent exhibit will feature the latest in hardware and software of interest to the computer science research community, according to conference sponsors.

Registration for this event is set at $90 for AAAI members and $125 for others. Further details are available from AAAI, 445 Burgess Drive, Menlo Park, Calif. 94025.

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1 **PerpetualProcessing™ Reliability** – Computer Consoles' Power5™ family of systems can withstand multiple failures because each subsystem operates independently with its own copy of the operating system. This contrasts with other "fail-safe" systems which depend upon synchronized pairs or multiple processors around a single shared memory. Designed with high volume transaction processing in mind, CCI's fault tolerant architecture has been a staple of critical telephone industry applications since 1973.

2 **A Highly Flexible Operating System** – PERPOS™, CCI's proprietary operating system, is designed to support high volume, high availability transaction-oriented environments. PERPOS, fully compatible with UNIX*, is easy to use, and supports program development. It also supports a full complement of languages, such as FORTRAN, COBOL, BASIC and "C" as well as data base management.

3 **Complete Networking Facilities** – CCI's Data Highway™ can be used as the interconnect vehicle for many types of local communications. It also functions as the vehicle to link independent subsystems in PerpetualProcessing. A Distributed Communications Applications Processor (DCAP) can be used, in conjunction with standard carrier facilities, to provide remote communications with other CCI or other vendors' systems.

4 **A Fully Compatible and Expandable Family of Systems** – Because CCI's operating system is used throughout the Power5 family, you can start with the Power5/20™, a self-contained single processor system. This can later be integrated into a multiprocessor system with thousands of terminals, configured to your requirements without unnecessary duplication of hardware.

5 **Established Support** – Computer Consoles has a fully trained Field Service force at over 75 sites throughout the United States and Canada. Installation and maintenance of every CCI system is coordinated by a network of system software and hardware support specialists.

The Power5 family, combined with OFFICEPOWER™, CCI's integrated office automation system, provides full office and data processing functionality.

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*UNIX is a trademark of Bell Laboratories.

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☐ Send me further information on CCI's OFFICEPOWER system.

☐ Please tell me about your OEM Program.

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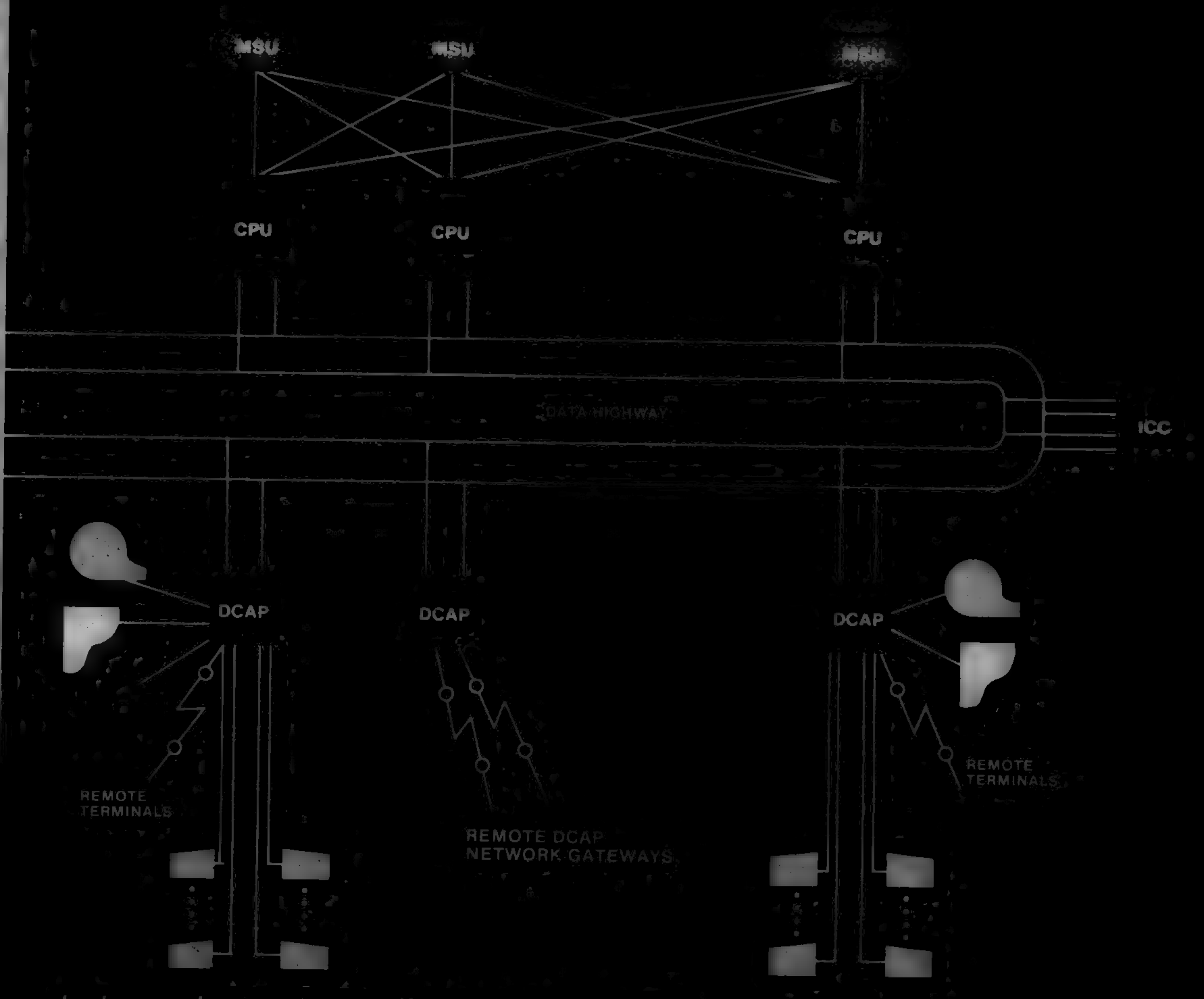

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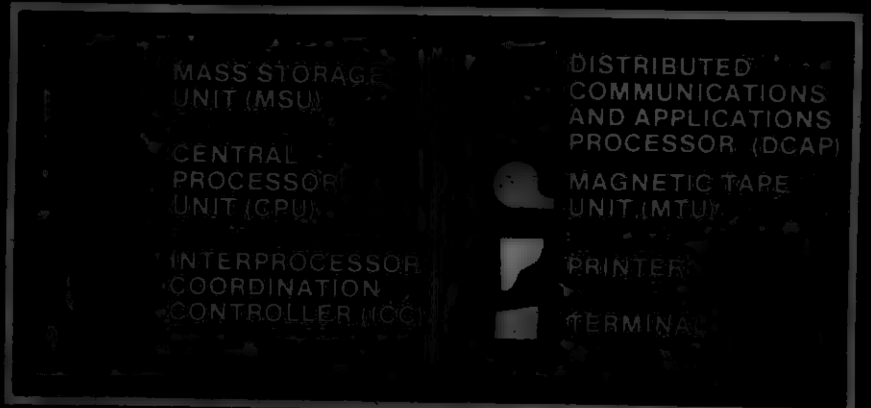
MASS STORAGE UNIT (MSU)
CENTRAL PROCESSOR UNIT (CPU)
INTERPROCESSOR COORDINATION CONTROLLER (ICC)
DISTRIBUTED COMMUNICATIONS AND APPLICATIONS PROCESSOR (DCAP)
MAGNETIC TAPE UNIT (MTU)
PRINTER
TERMINAL

Calendar

Week of March 20

March 21-23, Washington, D.C. — **Office Automation: Concepts, Systems and Applications.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 25, Cleveland — **Computer Law Institute.** Contact: Bar Association of Greater Cleveland, Mall Building, Cleveland, Ohio 44115.

Week of March 27

March 28-29, Washington, D.C. — **How to Manage Data and Information as a Resource.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

March 28-30, Summit, N.J. — **Data Processing for the Non-DP Executive.** Contact: Chubb Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

March 28-30, Tampa, Fla. — **Computer Security and Disaster Recovery Planning.** Contact: Nancy DeMatteo, Registrar, HSH National Management, Inc., Suite 215, 150 E. Wilson Bridge Road, Worthington, Ohio 43085.

March 28-31, Washington, D.C. — **51st International Operational Data Security Workshop.** Contact: International Association for Computer Systems Security, Inc., 6 Swarthmore Lane, Dix Hills, N.Y. 11746.

March 28-April 1, San Francisco — **ACE Professional Development Week.** Contact: Association for Computing Machinery, 969 Dolores St., San Francisco, Calif. 94110.

March 28-April 1, San Francisco — **Advanced Vsam.** Contact: Ellen Garfield, Software Education Corp., 1114 Ave. of the Americas, New York, N.Y. 10036.

March 29, Dallas — **Personal Computer Software Industry Forum '83.** Contact: Future Computing, Inc., 900 Canyon Creek Center, Richardson, Texas 75080.

March 29-30, Madison, Wis. — **Optical Storage of Information.** Contact: Francis P. Drake, Department of Engineering & Applied Sciences, University of Wisconsin — Extension, 432 N. Lake St., Madison, Wis. 53706.

March 29-31, New Orleans — **SAS Basics Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

March 30-31, Washington, D.C. — **Shared Information Management: Effective Means of Defining User/DP Roles.** Contact: Peggie Garre, Boeing Computer Services Co., Education and Training Division, P.O. Box 24346, Mail Stop 9A-90, Seattle, Wash. 98124.

Week of April 3

April 4-5, Boston — **How to Use Desktop Computers in the Professional Design Firm.** Contact: Terri Connell Management Associates, Inc., 1145 Gaskins Road, Richmond, Va. 23233.

April 4-6, Washington, D.C. — **Data Dictionaries: Concepts, Contents and Uses.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

April 4-6, New York — **Job Control Language.** Contact: Chubb Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

April 4-8, Kansas City, Mo. — **Systems Analysis Workshop.** Contact: Bill Schoonmaker, Brandon Systems Institute, 4720 Montgomery Lane, Bethesda, Md. 20814.

April 4-8, Santa Clara, Calif. — **MVS Diagnostics Techniques.** Contact: Amdahl Education Center, 1250 E. Arques Ave., M/S 302, Sunnyvale, Calif. 94086.

April 4-15, Chicago — **MVS System Fundamentals.** Contact: Amdahl Education Center, 1250 E. Arques Ave., M/S 302, Sunnyvale, Calif. 94086.

April 4-15, Santa Clara, Calif. — **CP Internals.** Contact: Amdahl Education Center, 1250 E. Arques Ave., M/S 302, Sunnyvale, Calif. 94086.

April 5-6, New York — **Local Networks: Promise Into Practice.** Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55424.

April 5-6, San Diego — **International Symposium on Automated Integrated Manufacturing.** Contact: Leonard B. Gardner, 2406 Buttetop Place, Spring Valley, Calif. 92078.

April 5-7, San Francisco — **Optical Storage Technology Management.** Contact: Technology Opportunity Conference, P.O. Box 14817, San Francisco, Calif. 94114.

April 5-7, Columbus, Ohio — **CBT Courseware Design.** Contact: Educa-

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- The "Who's Who" of EDP Decision Makers
- 9,250-15,250 Top Computer Executives/Dir.
- 3,000-5,000 Computer User-Sites/Region
- Installed Mainframes & Minicomputers Listed
- FUTURE PLANS: Projected upgrades, discards, acquisitions of hardware and software specified with dates in user section and index.
- Fortune 500, Fortune 1000 and major non-industrial companies listed
- RJE & Timesharing with computers at other locations specified in user section and hardware index.
- Company, division, address, industry, main phone #, contact's name, title, functional area, direct phone # or ext., major hardware installed, major software used, consultants used, applications, & misc. info.
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Calendar

tion Coordinator, Goal Systems International, 5455 N. High St., Columbus, Ohio 43214.

April 5-7, Salt Lake City, Utah — **Jovial-Ada Users Group.** Contact: Paul C. Wood, Sperry Computer Systems, Defense Systems Division, P.O. Box 43525, M.S. U2P14, St. Paul, Minn. 55164.

April 5, Washington, D.C. — **Designing VLSI.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

April 5-8, Las Vegas — **EFT Expo.** Contact: Electronics Funds Transfer Association, Suite 800, 1209 Vermont Ave. N.W., Washington, D.C. 20005.

April 5-8, New York — **Computer Culture.** Contact: Conference Department, New York Academy of Sciences, 2 E. 63rd St., New York, N.Y. 10021.

April 5-8, San Diego — **Digital Communications.** Contact: Ruth Dordick, Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

April 5-8, Tokyo — **Communications Tokyo '83.** Contact: Clapp & Poliak International, P.O. Box 70007, Washington, D.C. 20088.

April 5-8, Washington, D.C. — **Computers/Graphics in the Building Process.** Contact: World Computer Graphics Association, Inc., Suite 250, 2033 M St. N.W., Washington, D.C. 20036.

April 4-8, Vancouver, B.C. — **James Martin Seminar — Productivity.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

April 5-13, Columbia, Md. — **ACF/Vtam.** Contact: Amdahl Education Center, 1250 E. Arques Ave., M/S 302, Sunnyvale, Calif. 94086.

April 6-8, Phoenix — **Network Communications Protocols.** Contact: Center for Advanced Professional Education, Inc., 11928 N. Earlham, Orange, Calif. 92696.

April 7, Palo Alto, Calif. — **California Computer Show.** Contact: Norm DeNardi Enterprises, Suite 204, 289 S. San Antonio Road, Los Altos, Calif. 94022.

April 7-8, Minneapolis — **Software: A Legal Briefing for EDP Professionals.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

April 7-8, Washington, D.C. — **Data Administration: Development and Practice.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

April 7-8, Newport Beach, Calif. — **Digital Communications Seminar.** Contact: Technology Transfer Society Seminars, Department Digcom, P.O. Box 3608, Torrance, Calif. 90510.

April 7-8, Boston — **Unix System Administration.** Contact: Institute for Advanced Professional Studies, 55 Wheeler St., Cambridge, Mass. 02138.

April 7-8, Washington, D.C. — **Local Networks: Promise Into Practice.** Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55424.

April 7-8, San Diego — **VAX/11 Basic Professional Seminar.** Contact: Digital Data Dialog, Suite 101, 609 S. Escondido Blvd., Escondido, Calif. 92025.

April 8-9, Concord, N.H. — **Computers in Education.** Contact: Anne Knight, Computer Services, Stoke Hall, University of New Hampshire, Durham, N.H. 03824

Week of April 10

April 10-13, Boston — **Computer-Based Training Conference.** Contact: Data Training, 176 Federal St., Boston, Mass. 02110.

April 10-13, Miami — **Communications Expo '83.** Contact: Latcom, Inc., 1200 East St., P.O. Box 860, Westwood, Mass. 02090.

April 10-13, Washington, D.C. — **1983 ACM International APL Conference and Exhibition.** Contact: Don Link, STSC, Inc., 2115 E. Jefferson St., Rockville, Md. 20852.

April 10-15, Dallas — **DP Training Managers' Workshop.** Contact: Linda Hubacek, Deltak, Inc., 1751 W. Deihl Road, Naperville, Ill. 60566.

April 11-12, Newport Beach, Calif. — **Digital Communications Seminar.** Contact: Technology Transfer Society Seminars, Department Digcom, P.O. Box 3608, Torrance, Calif. 90510.

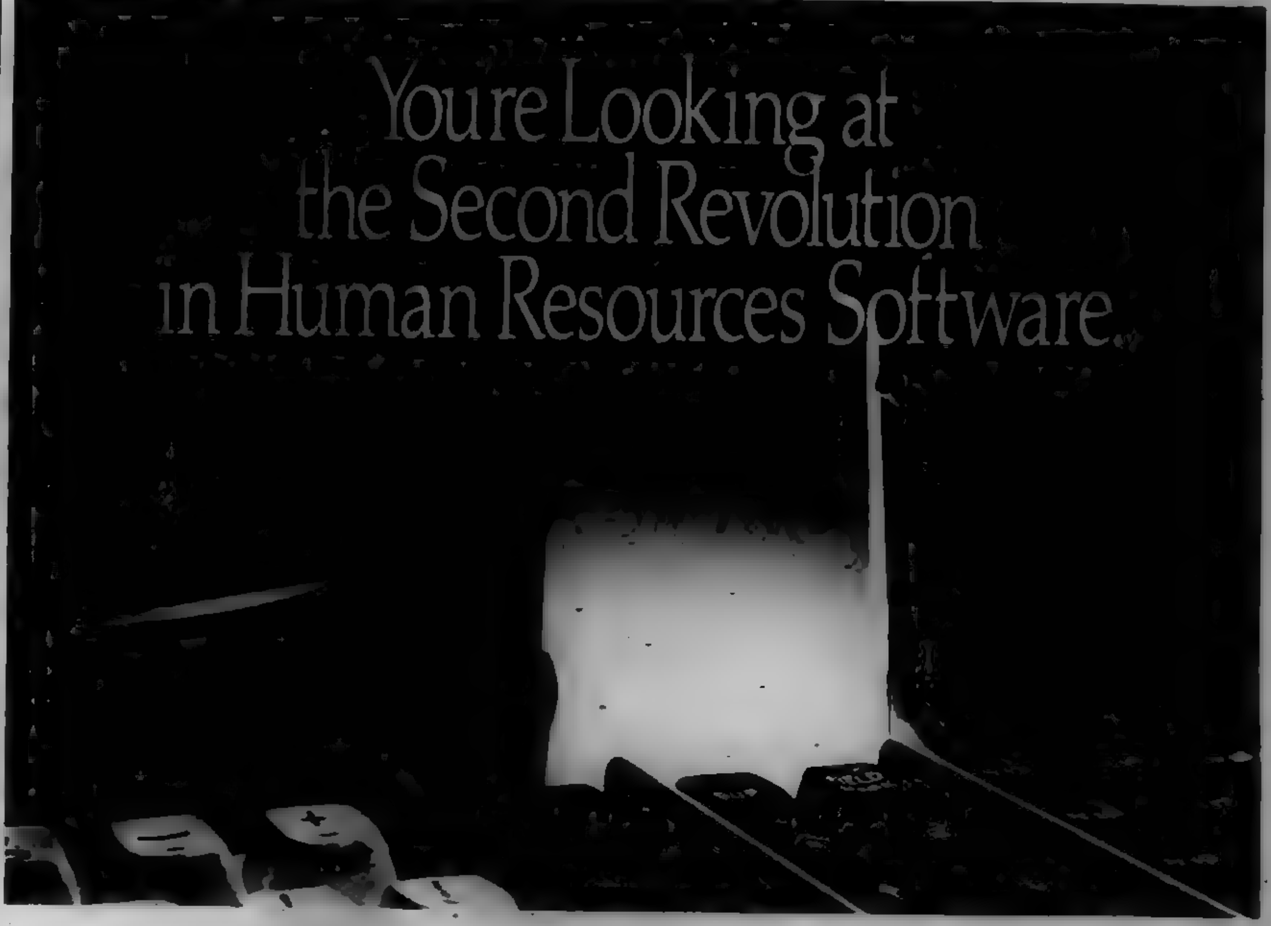
April 11-13, Los Angeles — **Improving Automated Payroll Systems.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

April 11-14, Louisville, Ky. — **Project Management.** Contact: Bill Schoonmaker, Brandon Systems Institute, 4720 Montgomery Lane, Bethesda, Md. 20814.

April 11-15, Boston — **James Martin Seminar — Productivity.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

April 13-15, San Francisco — **Network Communications Protocols.** Contact: Center for Advanced Professional Education, Inc., 11928 N. Earlham, Orange, Calif. 92696.

April 14-15, Minneapolis — **Software: A Legal Briefing for EDP Professionals.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.



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EDITORIAL

Worth the Risk?

To beta or not to beta? That is the question with which DP managers must wrestle when asked to let their shops serve as test sites for new products. They must decide whether it is nobler to stick with what exists — the proven, established equipment — or to run with an untried product in pursuit of greater glories, like increased efficiency and financial savings.

Do the potential benefits of acting as a test site outweigh the risks? They do if you're prepared to deal with the very real possibility that the project may fail.

The issue of test sites was brought to mind by a recent series of scrimmages with a software financial management package [CW, March 7]. When Software International Corp.'s Fiscal Control/80 package fell short of its promised mark, the company reimbursed the town of Brookline, Mass., as well as the state of Kentucky for their respective inconveniences and then went back to the drawing board with the software. No hard feelings on anyone's part. The governments tried it, they didn't like it, and they got their money back.

In the meantime, the city of Pittsburgh, Pa., was also experiencing some dissatisfaction with Fiscal Control/80. Unlike Brookline and Kentucky, however, Pittsburgh felt so wronged that it would not be content with reimbursement. The city filed a number of breach of contract letters, petitioning the software company and the city's consulting firm to restore the DP dollars that were already sunk into the experiment, plus a few extra hundred thousand dollars to make up for the inconvenience. It won a hefty settlement totaling almost $1 million.

Why did two test sites let Software International off the hook while another insisted on pursuing the vendor? Our only guess is that a clear definition of "test site" was never agreed upon between the vendor and the city of Pittsburgh.

It seems unfair that Pittsburgh was able to profit from a vendor's mistake when it had willingly assumed the risk for just that possibility. A test site is meant to test the product — not guarantee it.

Perhaps the lesson to be learned here is that vendors should work to describe explicitly what it means to be a test site. Then it's up to the user to decide if it's worth the risk.

DATA PAST

Five Years Ago
March 13, 1978

SAN FRANCISCO — A former IBM employee was prepared to tell the jury hearing the Memorex vs. IBM antitrust case that he told IBM's disk drive facility management some of the firm's pricing actions violated the 1956 consent decree against the firm.

The jury never got to hear the testimony, for Judge Samuel Conti deemed the employee too far down the corporate ladder, even though Conti admitted, "[the testimony] could . . . swing the whole case in the eyes of that jury."

— — —

Mad magazine came out strongly against the Universal Product Code (UPC). The reason? As *Mad* described it, the UPC looks "yecchy."

Ten Years Ago
March 14, 1973

CHICAGO — The Computer Foundation, which was scheduled to take over the certification of data processors in July, was thrust further toward an open power struggle in which the Data Processing Management Association and the Association for Computing Machinery squared off against other participating societies, as the two controlling organizations moved to consolidate the powers of their self-appointed cochairmanships.

— — —

WHITE PLAINS, N.Y. — IBM added three models to its 3420 magnetic tape system that records data at the "densest recording capability yet offered," according to a company spokesman.

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LETTERS

Free Enterprise Fantasy?

I find the position *Computerworld* took in the editorial "Talk Is Cheap" [CW, Feb. 7] to be a curious stance for a newspaper serving the information processing industry.

I suppose, however, that even in an industry that has caused so much change and will continue to cause change in our society, once positions have been established, the incumbents look for ways to protect their positions through almost any means available, rather than relying on continued success in a competitive environment.

The editorial chided President Reagan for taking a "flight into free enterprise fantasy." After pointing to certain federal subsidies and tax programs that Digital Equipment Corp. used to construct a plant in Massachusetts, the editorial implied that a continuation or expansion of such federal programs is necessary for the continued health of high-technology industries.

Any thorough examination of the facts, either on a microeconomic basis with respect to individual firms or a macroeconomic basis viewing the economy, would lead to the opposite conclusion.

In my business, I frequently assist high-technology corporations in funding their growth.

It is my experience that while such subsidies and/or tax incentives may occasionally alter a decision with respect to location or timing of facilities expansion, they virtually never affect the decision of whether or not to expand.

Furthermore, these incentives are available to a wide range of industries.

With the exception of the recently enacted research and development tax credit, very few incentives are specifically targeted at high-technology industries.

Finally, and perhaps most importantly, economists have found a negative correlation between levels of government involvement — either directly through regulation or otherwise — and industrial-segment growth areas.

At the risk of also taking a "flight into free enterprise fantasy," I suggest *Computerworld* reconsider its editorial position and favor those federal policies — generally passive policies — that enhance the factors most conducive to the technology industry's growth to date.

These policies include the following: low international trade barriers on technology products and services, high rates of capital formation and high levels of competition within the technology industries with respect to customer markets, employees, ideas and capital.

The information processing industry is not immune to general economic conditions, but neither does it need a special set of provided (and, therefore, controlled conditions) for it to flourish.

I suggest *Computerworld* look at the conditions that caused this industry to grow, rather than request the same type of government involvement currently "enjoyed" by the steel and automobile industries in this country.

Jim C. Cowart
Vice-President
Shearson/American Express, Inc.
New York, N.Y.

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. Letters may be edited for purposes of brevity and clarity. Letters should be addressed to Editor, *Computerworld*, 375 Cochituate Road, P.O. Box 880, Framingham, Mass. 01701.

SOFTLINE/Werner L. Frank

Singapore Vying for Software Center Stage

Singapore is a small republic occupying about 226 square miles and having no natural resources. The main "product" is the nation's aggressive program for building a major commercial and shipping center based on the free port concept, together with exploiting the intellectual capacity of the population. With respect to the latter, computer software has attracted the attention of the government, which plans to make Singapore the software center of the Asian region.

> *'The mission of the National Computer Board is to establish Singapore as a center for computer services, with an emphasis on software development. This focus on computers, and especially software, has encouraged local and foreign entrepreneurs to open dozens of new companies and branches of overseas organizations in pursuit of business.'*

Singapore's economy struggles to function in the midst of extraordinary contradictory forces. On the one hand, in order to keep pace with the ambitious plans of the federal government to upgrade living standards and achieve economic progress, Singapore has a tremendous need for manpower.

On the other hand, the government has in place a vigorous program designed to limit population growth because of the small size of the republic's territory. Two solutions are being pursued, one for the short term and the second for the long haul.

Guest workers with temporary work permits have been imported from surrounding nations to expand the work force. They also augment Singapore's 2.4 million native population and represent only a short-term solution. The long-range answer for Singapore's hard-pressed economy is to multiply productivity of its citizenry, and that is where computers and automation come in.

Computer Education Program

In preparing to support the far-sighted vision of the prime minister, the government recently entered into a major computer education program and placed enormous power and responsibility on the central National Computer Board (NCB).

Education is being tackled from two directions. At the top is the establishment of a number of advanced academic institutions for the promotion of data processing know-how and practice. There is, for example, the Institute of Systems Science, a teaching facility jointly formed and operated by Singapore and IBM. The institute was established to teach computer appreciation and planning courses to senior management and advanced technical courses to experienced DP personnel.

Two other advanced training facilities have been set up, one in cooperation with the Japanese and the other with the British. Both of the institutions were designed to train programmers and systems analysts, but they serve only the present business and professional community.

Secondary Schools

A much deeper and more far-reaching program has been endorsed and put into place for training the next generation of Singaporeans in preparation for an automated society. This is the computer science program under way in the secondary school system for 12-year-old to 14-year-old students.

A two-year course is now in a pilot phase in 30 schools. Singapore has purchased 80 Apple Computer, Inc. Apple II computers, 131 Nippon Electric Co. NEC 8000 devices and 300 Atari 800 systems from Atari Corp. Basic is the language being taught. In addition, computer clubs are being established throughout the country.

Ultimately, all schools will provide such a program, anticipating the future computer awareness needs of the entire population. The major problem at the moment is the severe shortage of teachers trained in DP.

NCB, constituted in September 1981, is a brand-new factor. Under the leadership of Philip Yeo, NCB was rapidly formed by assigning to [illegible] the government's DP civil servants and by recruiting additional personnel from the outside. At present, it is a 240-member organization, representing about 10% of the total DP manpower of a country in which there are already approximately 1,000 computers in the mini and mainframe categories.

These statistics suggest an incredibly low ratio of professionals per CPU, but such a computation is deceptive since a good number of computer installations are with multinational companies whose software is derived from distant parent organizations.

The mission of NCB is to establish Singapore as a center for computer services, with an emphasis on software development. This focus on computers, and especially software, has encouraged local and foreign entrepreneurs to open dozens of new companies and branches of overseas

(Continued on Page 54)

THE DATA CENTER/John P. Murray

The Question of Whether to Use Graphics

As we went through our planning for the installation and development of an information center within our organization, we struggled with the question of whether we should, as a part of the project, offer anything in terms of graphics capabilities.

We had reservations. The cost of the software and hardware was a factor that we could not ignore. Also, having had no experience with graphics, we felt we would have a somewhat difficult time selling the concept of our management information systems (MIS) clients. After due consideration, we decided that the potential results that could be obtained were worth the risks involved.

While some use of graphics had been in effect in the organization, it was limited, and what was being done was being done by hand. Because of our limited experience with graphics, we felt it would be prudent to introduce the use of graphics on a low-key basis.

Getting Ready

We delayed the introduction of graphics until we had the information center in operation and until we had begun to build our credibility with the information center.

We felt that attempting too much at once, the introduction of both the information center and the use of graphics, might be detrimental.

The original suggestion that we produce information in a graphic format, even with clients who by that time had experience with the information center and who were enthusiastic about its use, was not met with any sense of excitement. The general feeling was that such information would be nice, but not significantly better than the use of numbers.

We were able to convince several clients to give it a try in order to see what it would do for them. Our first attempts, the first charts and graphs we produced, caused only a moderate response. The feeling was that something was nice, but it was seen as more of a curiosity than anything else.

However, we were able to make more progress and to gain interest in the subject when we included a series of displays that were photographed directly from the color CRT as an integral part of a slide presentation given to an organization's senior management.

Properly photographed, these slides produce a very dramatic impression when incorporated as part of a presentation.

This is even more dramatic when the slides address subjects senior management is familiar with and that they have been used to seeing in the past as a series of numbers.

Here's a hint for anyone making 35 mm slides from a color CRT: Follow the photographing directions, which can be obtained from the vendor. Make certain the lighting in the room provides the correct contrast. Finally, make absolutely certain that all fingerprints have been removed from the CRT screen. These things may be obvious to people with photographic backgrounds, but as novices, we had to learn the hard way. Done correctly, the results can be dramatic.

Once members of the senior staff began to ask if various types of information could be presented as graphics, the demand for such information began to increase rapidly. Although we do have the facilities to produce 35 mm slides, most of our graphic work is printed on paper.

As people begin to use graphics, the variety of information produced graphically will increase. Once graphic information produced via the computer becomes routine in one or two departments, everyone will want to make use of the facility.

Explaining Unfamiliar Situations

The use of graphics can be very beneficial in explaining situations that are unfamiliar. As most people in MIS know, attempting to explain hardware resource utilization to non-MIS people, either verbally or through the use of a series of numbers, can be a frustrating and often futile task. Using a graphic display can prove most helpful in putting the message across.

There is another attraction to the use of graphics. When clients are able to produce without assistance their own graphics, there is a real sense of accomplishment. To be able to enter raw data and produce meaningful, attractive graphs without a great deal of MIS mumbo jumbo, is not only an achievement for a client; it helps to present MIS in a positive manner. Anything that helps to improve the MIS image is certainly desirable.

If the question of whether to provide graphics capabilities through the MIS department is being raised in your MIS department or if pressure to do so is being exerted from outside or if it seems as though it might be a good idea only to someone in another department, the idea should be supported and aggressively pursued. The results, provided it is done correctly, will benefit everyone.

Murray is director of MIS for Ray-O-Vac Corp., Madison, Wis. He is responsible for worldwide MIS activities. Murray has 21 years of DP experience, 10 of which have been devoted to the management of data centers.

HUMAN CONNECTION/Jack Stone

Can DPers Handle Cyberphobiacs?

This is the first article in a series, "DPers and the Psychocomputer Syndrome," coauthored with Joanne Barker.

If you have not already seen it, dig up *Computerworld Extra!* for Nov. 17, 1982, and read Harold and Elizabeth Guarnieri's mind-blaster, "The Psycho-Computer Syndrome." I cannot recall ever having responded to an article in the trade press in such an emotional way.

On the surface, everything about the article seems correct. The authors appear to have completed a fine piece of research into a very complex and important problem, namely, dealing with the new end users who fear computers — "cyberphobiacs." The authors consolidate their knowledge into insightful conclusions and come up with a neat description of the transitional mental, emotional and social processes that such users experience. A cool and crisp eight-stage syndrome beginning with "emotional and intellectual insecurity" and ending with "equilibrium [and] a new office routine" is presented.

Nevertheless, I was really upset by the article, partly by what it said, but more so by what it did not say. I realize that my ideas on the subject are subjective, but they are based on the heuristics of more than a decade of training computer users.

I was troubled by the statement by Prof. Sanford Weinberg of St. Joseph's University in Philadelphia, a presumed authority on the subject, suggesting that "as many as 30% of our population are cyberphobiacs." I flatly reject this projection. Based on my experience, I offer 3% as a more appropriate estimate.

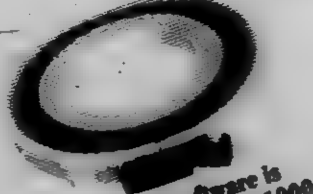
It may be that the difference is only a semantic one, but it nonetheless has to be addressed. According to the dictionary, "fear" is "a feeling of uneasiness or apprehension; concern," implying that this is a perfectly normal human reaction. This definition is to be contrasted with the definition of "phobia" which, according to the same authority, is "an *irrational*, excessive and persistent fear of some particular thing or situation," and is generally considered to be an abnormal human reaction or psychological disorder.

'Fearful' Users?

Perhaps Weinberg meant that many new users are *fearful* of the advent of computerization, wherein the fears are derived from a *rational* set of circumstances and should not be attributed to psychological disorders any more than the fears encountered by most of us while learning to drive cars or to ski should be attributed to neuroses. Such fears, it seems to me, can indeed be handled by DPers in ways that are analogous to those used by driving and skiing instructors.

But it just does not seem reasonable to me that three out of every 10 new users possess "irrational, excessive and persistent fears" of the impending drop-off of terminals on their desks. Maybe Weinberg was suggesting that many new users should be classified as neurotic before the announcement of an automation program. In this case, the users are already burdened with the myriad personal, social and political pressures of business life, and thoughts of having to deal with computing machinery only accentuate hostile attitudes.

If this latter assessment is anywhere near correct, operational instabilities in user departments would be far worse than they are and information system managers would be pushed into the role of pseudopsychiatrics in order to implement systems. But answer this one for me: Is a DPer the kind of person you want to treat your neurosis?



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READER COMMENTARY/Bud Stoddard‡

Are You Ready for a Data Center Disaster?

As I meet with front-line managers of major manufacturing, financial and service organizations each day, it both amazes and disturbs me that there has been such little planning and, more importantly, such little implementation done with respect to disaster readiness.

Virtually every major corporation today has a preeminent dependency on data processing. That dependency is so great that the loss of computer uptime or the destruction of programs, documentation or data files would cripple the organization temporarily and, perhaps, permanently.

Imagine the ramifications of not being able to process data for just five working days in your company. Manufacturing resource planning stops and, ultimately, manufacturing. The purchase order system halts and you cannot order parts, supplies and inventory. Cash management becomes nonexistent. Accounts payable cannot pay vendors, and worst of all, billing and accounts receivable stop and employees face a payless payday.

To suggest that these critical functions could be continued manually in a multimillion dollar company is, I think, a totally naive position to take, particularly during a time of disaster. In such a situation, the organization would be in total disarray, and most of the staff would be in trauma. You cannot expect personnel to function normally when disaster strikes.

Disaster Takes Many Forms

Make no mistake, it *can* happen, and it *will* happen. Perhaps the computer center will not burn to the ground or a militant group will not plant a bomb in the data center, but a disaster can take many forms.

Think of a disaster as anything that forces you to stop processing for two hours or more (in some industries, such as medicine and banking, substantially less than two hours). A disgruntled employee, upon being dismissed, will steal data or mislabel backup tapes. There will be another Blizzard of '78. Extreme temperature or a dirty disk pack will cause a head crash. A new programmer will inadvertently write over a critical tape.

These incidents do happen every day; they just are not publicized. After all, if you experienced a small disaster tomorrow morning you would, no doubt, keep it as quiet as possible. During a disaster, customers lose confidence, vendors are afraid that they will not be paid, employees get nervous and top management gets angry. Also, headhunters come after your most valued DP staff members during a time of disaster.

Disaster Readiness Is a Need

Disaster readiness is a basic management responsibility, and the first thing to do is to realize that disaster readiness is a *need*.

Next, sell the importance of disaster readiness to top management. Get top management to commit resources, personnel and funds so that you can tackle the problem head on. Make top management realize disaster readiness is not something you can put off until the economy improves.

Next, conduct some sort of risk analysis to assess the damage of being without processing for a day, a week or a month. If you have people on staff who perform this function, gain their support. Meet with internal and external auditors. Ask the treasurer or controller the effects of not billing or collecting receivables for 10 days. Ask the payroll supervisor about the effects of not being able to print checks for your next payday.

In addition, make plans. Create a written game plan of what to do in the event of a disaster. The plan should address everything you do until normal operations are resumed. Some of the issues to be included are:

- A detailed account of emergency procedures.
- Advance identification of critical applications.
- A provision for alternative sources for each critical resource.
- A detailed analysis of needed personnel, plant, communications ability, hardware, supplies, forms and, most importantly, data (files, procedures and documentation).
- A detailed disaster organizational chart with all appropriate job descriptions.

In short, the written plan should be a detailed blueprint of every step between the time disaster strikes and the time normal, ongoing operations are resumed. Also, the document should be so comprehensive that a total stranger (technically proficient, of course) could bring you backup using nothing but the detailed plan.

Next, secure an off-site vault for documentation and data storage *now*. Eighty percent of loss, destruction, sabotage and theft is perpetrated by employees.

The next step is to make a written reciprocity agreement with a compa-

(Continued on Page 52)

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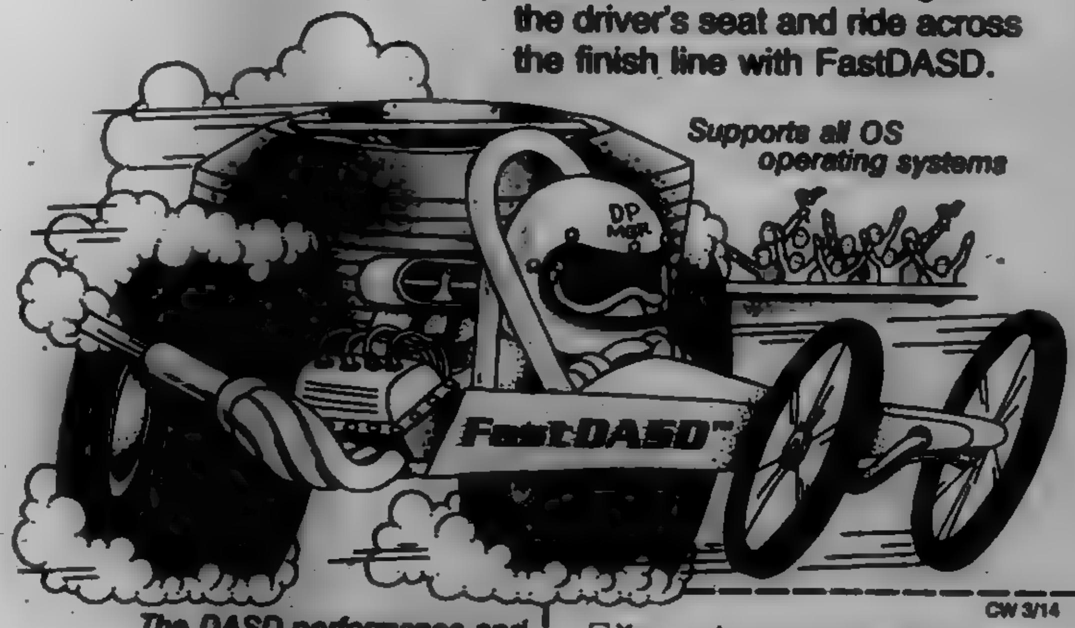

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Prescription for a Disaster Readiness Plan

(Continued from Page 49)

ny that has a similar equipment configuration and communications ability. However, a reciprocity agreement of and by itself is not sufficient backup for hardware replacement. This option is only of value in short-term situations and when it supplements additional backup capability.

There are two problems inherent in a reciprocity agreement. The first is that the firm providing reciprocity may be at such a high level of utilization that it cannot afford your support when disaster strikes.

The second is that all management information systems departments are in a state of change, and your shop and the reciprocal shop may no longer be compatible when the need arises. A commercial backup site will undoubtedly keep pace with your evolution more than a reciprocal company. Reciprocity serves a functional role in the disaster recovery process, but it must be supplemented with additional backup capability.

A Backup Facility

Next, contract for a backup facility. There are two principal types, a shell site and a hot site. Ideally, the backup center should be 25 to 50 miles away.

A hot site is the optimal solution. This is a data center which, as much as possible, mirrors your own. A shell is the same thing with one important difference: It does not contain hardware.

Once you have gone through the above steps, create a disaster (not a trail run or a test) and see if all this works. Do not tell anyone (except maybe your boss or the president) this disaster is not real. If your staff knows it is not the real thing, the results will not be there. When it is over evaluate, fine tune and test some more.

Finally, do not store the disaster plan in the computer room.

By this time, you are probably thinking this sounds like a lot of work, work you just cannot afford to do. The facts are, you cannot afford *not* to do it.

Stoddard is president of Datavault Corp., located in Needham Heights, Mass.

LETTERS

So-Called 'Remedy'

Many banks are giving up savings bond sales and redemptions. The problem is that savings bond interest is a labor-intensive, customer-initiated transaction, and there are no economies of scale. This is unlike interest payments on your bank account, which are bank-initiated and computer-controlled.

Withholding doesn't solve a compliance problem on your bank account interest, which banks have been reporting for years. Withholding solves a compliance problem on savings bonds because traditionally no records have been kept.

It would be ironic if the "remedy" of withholding not only killed the savings bond, but also crippled the savings account through disincentive to save, while sticking the banking industry for the cost of the weapon.

David Ames
Watertown, Mass.

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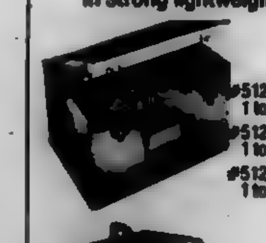

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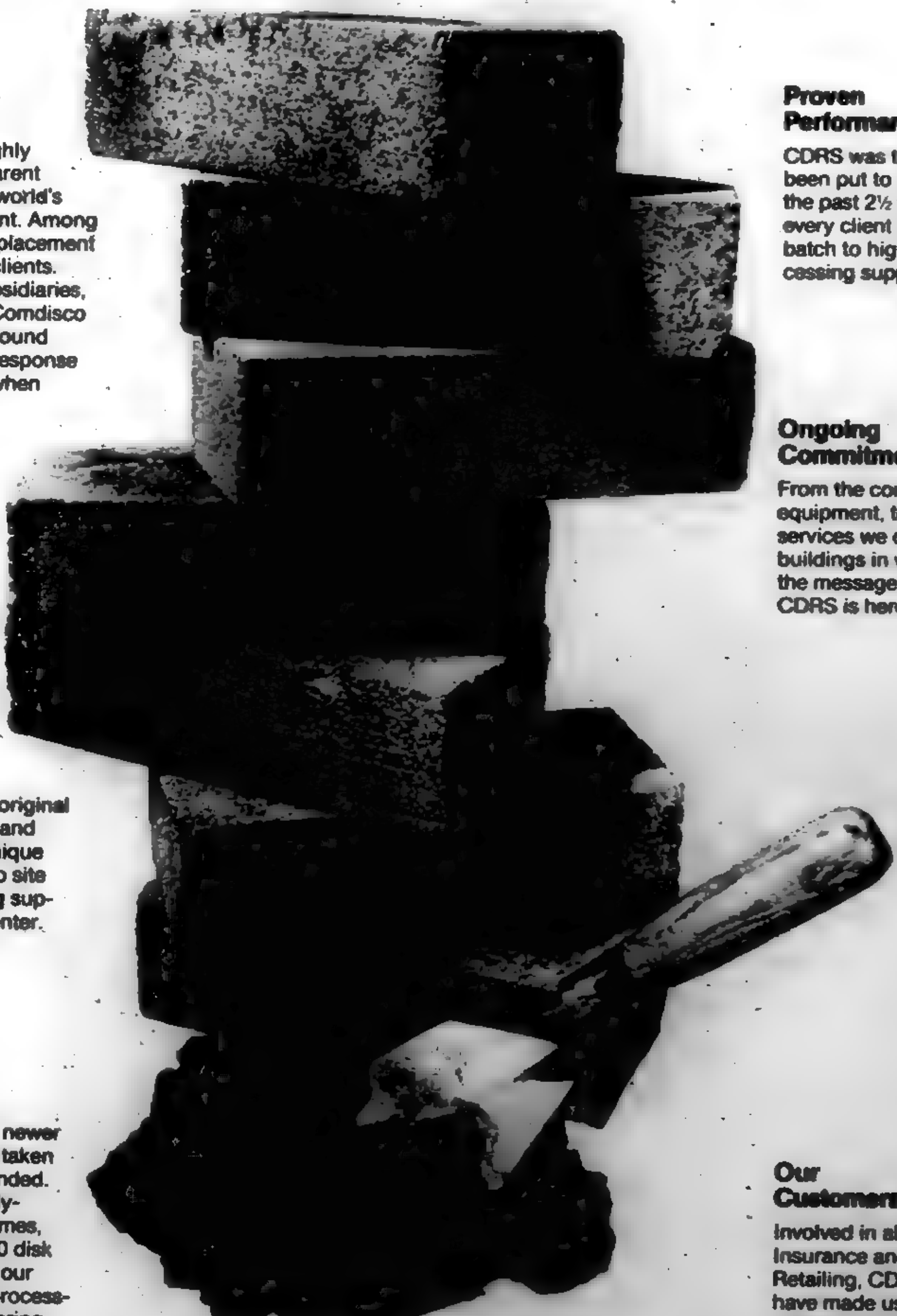

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LETTERS

Research Tax Credit

I would like to emphasize the importance of "Software R&D Tax Credit Rocky" [CW, Feb. 21] concerning the availability of the 25% research tax credit to the software industry. The availability of the research tax credit for companies engaged in software development will be severely restricted if regulations proposed by the Internal Revenue Service are not substantially modified.

The problem as it relates to software developers lies in the definition of which expenses will qualify for the credit. Under the IRS' approach, the research credit would be allowed only for costs where the operational feasibility of developing the software is in serious doubt.

A more productive approach for the IRS to adopt is for it to allow all software development costs to qualify for the research credit. This standard would replace the "operational feasibility" and "significant risk" tests with one that provides appropriate incentives for new software development. Under this definition, the IRS would still be free to exclude costs incurred for minor adaptions to existing software where there was not some reasonable level of development effort expended.

The regulations as now issued are only in proposed form. As such, it is very important for firms engaged in software development to submit comments to the Treasury Department before the regulations are finally adopted; comments must be submitted before March 25, 1983. I intend to submit comments about the impact of the proposed regulations on software developers.

George J. Yost
Coopers & Lybrand
Boston, Mass.

Singapore Vying for Software Lead

(Continued from Page 47)

organizations in pursuit of business.

Conflict of Interest

NCB is not entirely uncontroversial. Such a governmental organization, can have potential conflicts of interest when serving in both policy-making and executive modes.

Indeed, such a case has recently emerged wherein the commercial interests of software companies were threatened by the NCB chairman's statement that "NCB is the sole consultant, buyer of hardware and software and implementing agency." The implication was that all of the government's custom and turnkey software requirements would be met by the in-house staff.

But the same organization is now marshaling an important program for developing a software industry as part of the Science Park to be established in a specially selected area near the University of Singapore.

Financial Incentives

Financial incentives are being formulated to induce overseas organizations to set up software creation and production facilities in Singapore beginning in 1983. However, it should be clear to those interested that the motive is to create a software export business rather than to supply markets in Singapore alone.

If the past progress and determination of Singapore's government are any indication at all, we can expect that the objective of making the area a software center will indeed be realized.

But Singaporeans should be aware of one thing: Software innovation is not something that results from governmental decree. Rather, it springs spontaneously from the brains of human beings who are rich in hands-on application-oriented experience.

Frank is an independent consultant and president of the W.L. Frank Computer Group located in Calabasas, Calif.

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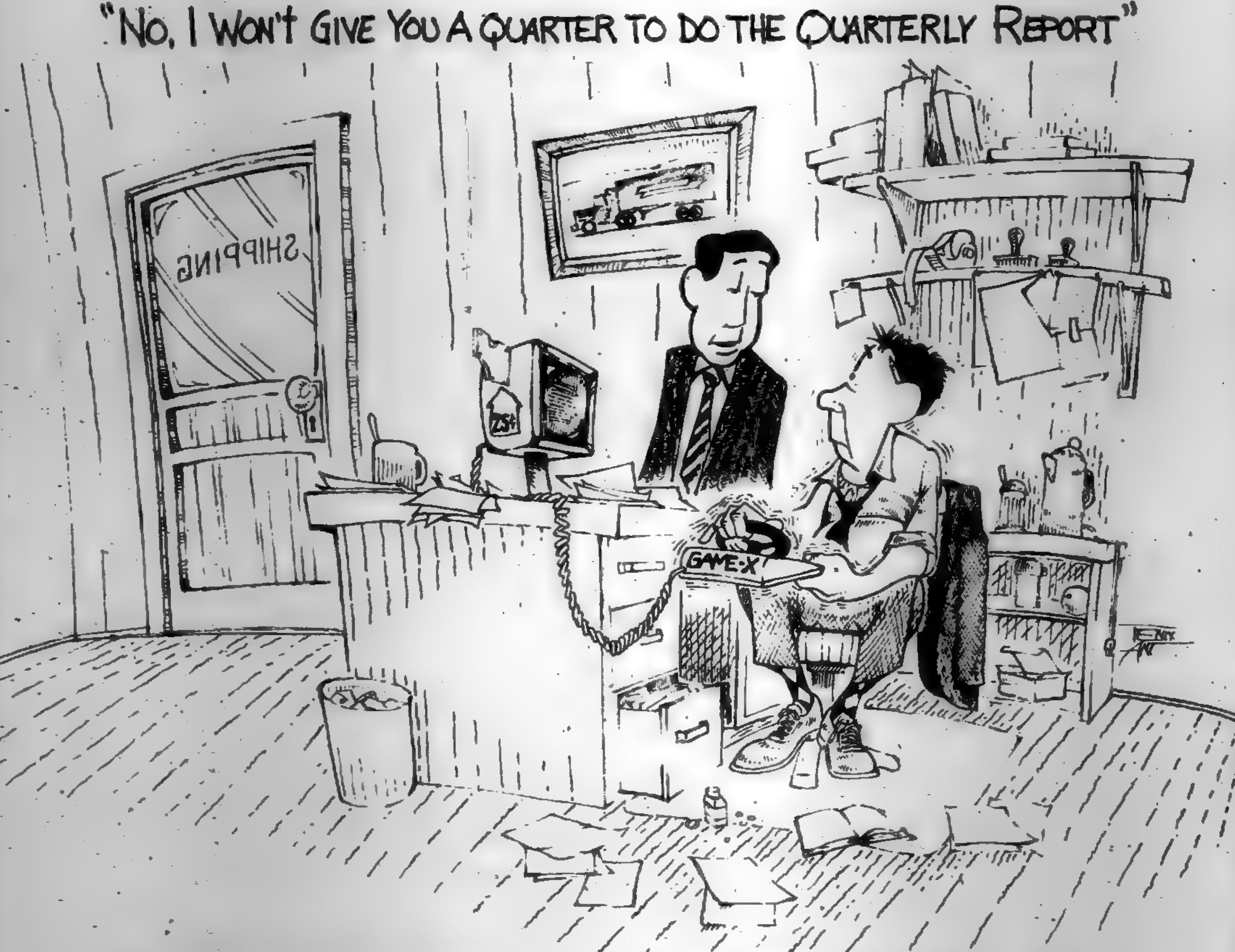
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Useful if Chosen Carefully

Ask Questions Before Jumping Into T/S

By Stuart Hoffman
Special to CW‡

The computer time-sharing industry has always existed under a cloud of suspicion nurtured by a few unscrupulous vendors. Nevertheless, the industry has flourished.

Time-sharing's secret has been learning to adapt. Users no longer require "raw time" on mainframes, so the industry in recent years has turned to providing data base and network services not available elsewhere.

If chosen and used thoughtfully, a time-sharing service can be a useful tool to businesses that need complex applications, but lack the time or resources to develop them in-house. However, a business considering time-sharing should be prepared to ask a few questions of prospective vendors.

Do I need a mainframe? While many applications still require a mainframe's speed and storage, enough noncritical applications exist to make it a good practice to check out the feasibility of running with a mini or micro.

What kind of support is available to me? Beware the one- or two-person sales office. They may be too busy hustling new business to have time to sit down and help you with your problems. Seek out a firm with a suitable ratio of support to salespeople at the branch office. There should be three programmer/analysts for each marketing representative.

Can I eventually take my software in-house? Many time-sharing firms will go out of their way to write an application system in their own proprietary languages. The result is that you are left with a system that will only run on that vendor's system.

Use only languages, packages and subroutines that are available on a purchase as well as a lease basis.

(Continued on Page 62)

Monitor Analyzes Vsam Performance

ROCKY HILL, Conn. — Software Technologies and Research, Inc. has announced an IBM Vsam Space Utilization Monitor (Vsum) designed to assist Vsam users with performance analysis and disk space management.

Vsum is said to analyze Vsam performance via actual data set interrogation coupled with catalog analysis. The Vsum reports provide graphics and statistical information on any Vsam file at the control-interval, control-area and data set level, the vendor said. In addition, the software will make performance recommendations as to control-interval size, buffer space requirements, data set reorganization and an indication that control-area splits are impossible.

The package reportedly provides users with processing options designed to allow control of report generation and statistical file creation. With these input options, reports are optional and can be rerun without reprocessing the Vsam data set, the vendor noted. Reports can be generated based on the complete data set, key ranges, control-area numbers, control-area sampling and volume selections. Statistical file options allow users to save the report statistics for historical reasons and reprint Vsum reports.

Reports included in the package include a data set report, performance recommendations, a control-interval report, a control-area report, a control-area graph and a key-range report.

The Vsum package costs $2,500, which includes the first year's maintenance. It is available for a free 30-day trial, the vendor said from 41 New Britain Ave., Rocky Hill, Conn. 06067.

'SMM/Tracs' Gets Update

SACRAMENTO, Calif. — Software Module Marketing Corp. has arnouced Release 1.6 of SMM/Tracs, a package that reportedly facilitates batch data transfer between unlike binary synchronous processors.

Designed primarily for CPUs using either IBM's DOS- or OS-oriented systems software, Release 1.6 includes multiple-line turnarounds in a single session and a full tranparency mode that allows transmission of packed or binary data.

Available April 1, Release 1.6 costs $5,500 for the DOS version; $8,000 for the OS type, from SMM at 1007 Seventh St., Sacramento, Calif. 95814.

'Single Image Software' Gets Updated Version

MARLBORO, N.J. — The Software Products Group of CGA Computer Associates, Inc. has released Version 7.0 of Single Image Software, formerly known as the Transparent Single System Image.

The software is comprised of three modules designed to maximize the productivity of multiple processors in a single environment. They include Super Multiple Systems Integrity facility, Global Console Director and Multiple Systems Manager. They enable consoles physically attached to any system to be logically connected to any other system in the complex, according to a vendor spokesman.

The package runs on IBM's SVS, MVT, VS1, MVS Base, MFT, MVS/SE1, MVS/SP1.1 and MVS/SP1.3 operating systems and costs $1,525 per site per month. CGA is located at Cannon Hill Farm, 255 Rt. 520 E., Marlboro, N.J. 07746.

OSI Service Targets Vsam

FORT LEE, N.J. — On-Line Software International, Inc.'s (OSI) IBM CICS Standards and Guidelines Development Service now includes a section on Vsam guidelines to detail Vsam, its structure, proper design and performance optimization.

In its introductory Vsam section, OSI defines the access method, the kinds of data sets used with Vsam and the advantages and disadvantages.

The entire service costs $19,000 from Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

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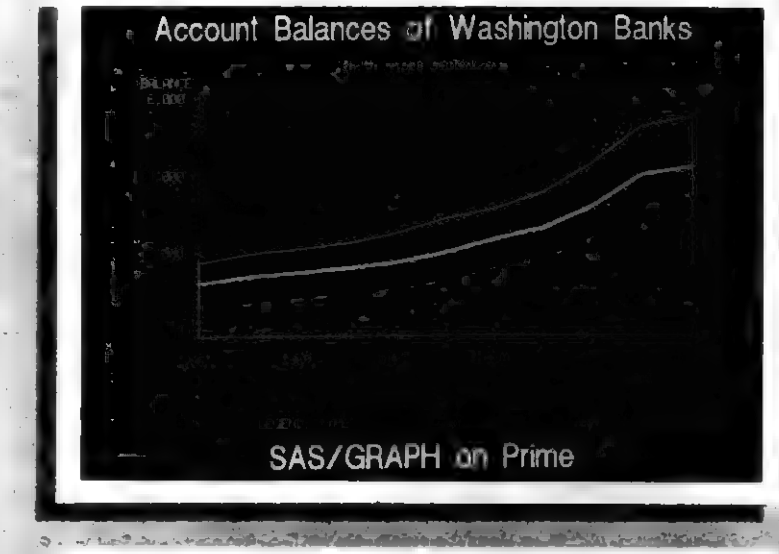

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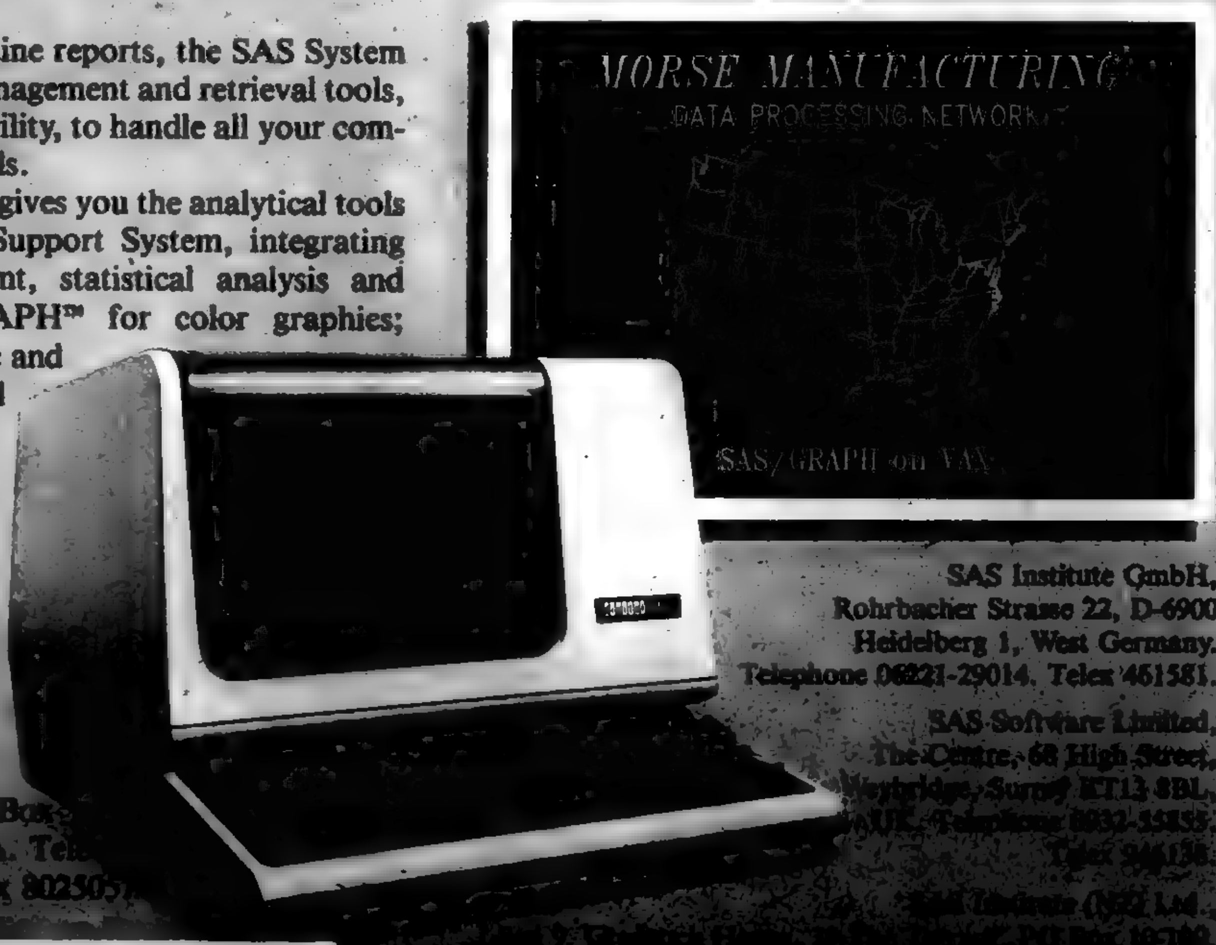

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'Statgraphics' APL-Based, Targets IBM

PRINCETON, N.J. — Statistical Graphics Corp. has announced Statgraphics, an interactive statistical graphics system written in APL and designed for IBM 370, 30, 3081 and 4300 series machines.

A spokesman said the system consists of 24 chapters containing over 200 user-documented APL functions, which can be used individually, integrated into other user-written functions or executed under the control of full-screen menus.

Features include use of screen fields for data input and option selection, direct access to graphics primitives, use of screen panels and programmed function keys to control execution and generate graphics and a split-screen feature allowing multiple plots on a single screen.

The package costs $3,800 for the first year with a $1,900 annual renewal fee. Educational institutions pay $1,900 for the first year, with a $950 annual renewal fee. The company can be reached through P.O. Box 1558, Princeton, N.J. 08540.

HP 250 Users Get Packages

FOREST HILL, Md. — File modification, security and payroll packages for Hewlett-Packard Co. HP 250 users have been unveiled by Maryland Computer Services, Inc.

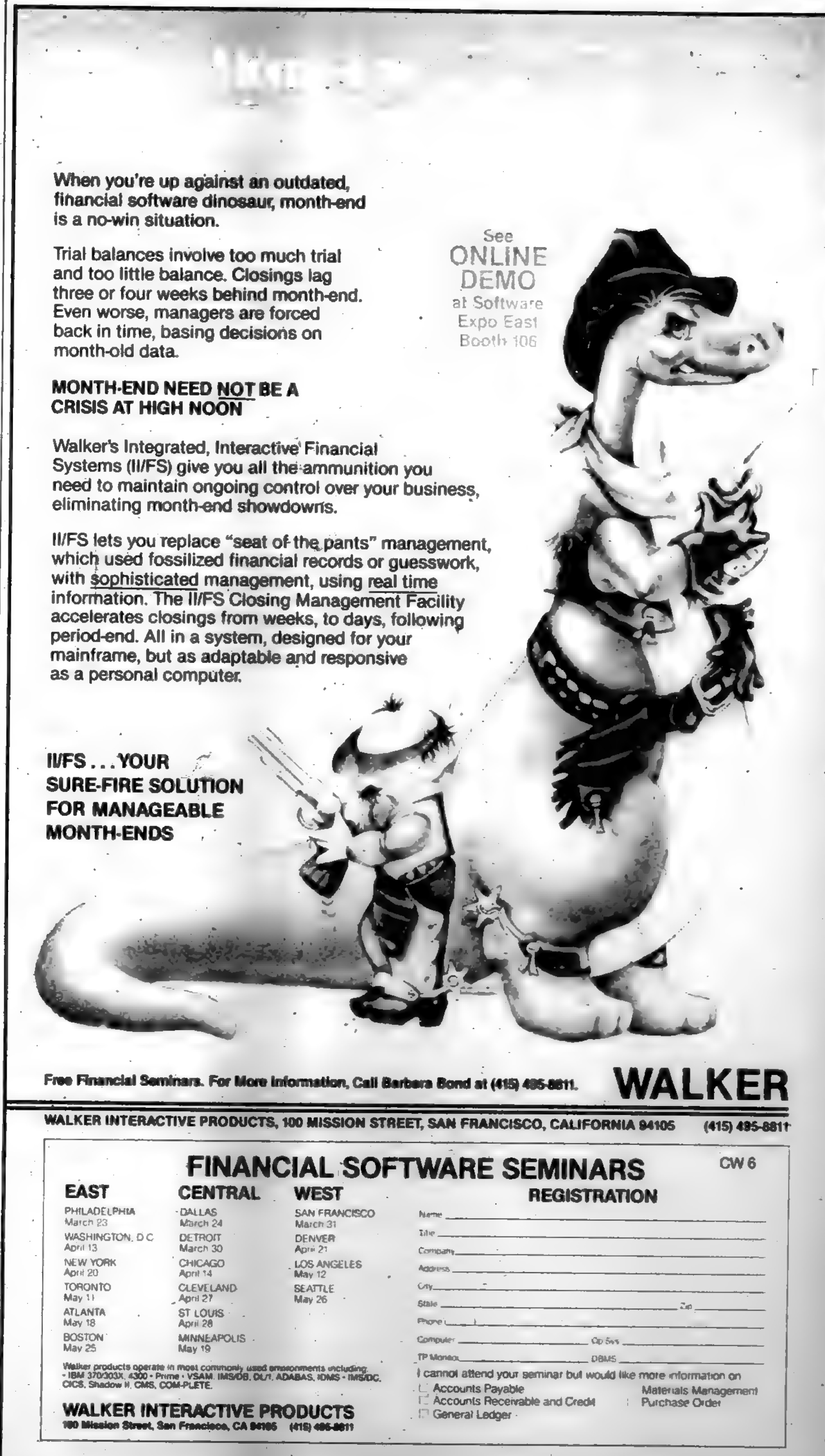
File Modification (Fmod) reportedly allows quick changes, which are then displayed on the screen to show a history of changes prior to updating the directory. Fmod costs $495 or $25/mo.

Secure features four combinable protection options: protected lines of code, erased program comments, erased program symbol table and an option to make run-only programs. Secure costs $495 or $15/mo.

The Payroll Software Package features user-defined tax tables, management reports, the ability to handle salaried/hourly employees and the ability to handle an unlimited number of deductions.

The package costs $1,500 for the first copy, $1,000 for each subsequent copy or an unlimited license for $10,000. Demonstration disks cost $150. Rental is available for $25/mo for the first copy and $10/mo for subsequent copies.

The firm is located at 2010 Rock Spring Road, Forest Hill, Md. 21050.



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Retrieval, Presentation Aid Debuts for IBM System/38

MILL VALLEY, Calif. — Fusion Products International has introduced Fusion 4/38, an information retrieval and presentation package for IBM's System/38.

Fusion 4/38 was designed to allow nontechnical users to extract and produce professional-quality reports from data resident in their computer system. The software is menu-driven and can perform mathematical calculations, custom document formatting and can be interfaced to a variety of output devices, including laser printers and 198-col. line printers.

The package includes a data dictionary that works in concert with the System/38's own data management functions to control and provide access to any piece of information defined to the system, the vendor said.

In addition to the definition, the dictionary stores a standard heading for the element, its decimal alignment and its standard display format.

Fusion 4/38 is said to be fully interactive and to provide full-screen format capabilities. Available immediately, it is priced at $5,000 in single-order quantities.

The vendor is located at 317 Miller Ave., Mill Valley, Calif. 94941.

Data Analysis System Gets Enhanced

BOULDER, Colo. — American Research Corp. has added four new data analysis procedures and a file interface program to its version of the SPSS, Inc. Data Analysis System for users on Tandem Computer, Inc. processors.

The new procedures are Logit Model, Cox Model, Cox Time and Kaplan Meier. Logit Model allows the users to determine survival rates using historical data. Cox Model is a procedure for analyzing time data arising from proportional hazards. Cox Time is an analysis tool for analyzing failure-time data using fixed co-variants. Kaplan Meier is used to describe and compare distributions of failure times.

A spokesman said the tools can be used in applications involving life cycles, product and process life expectancies, risk and hazard analysis and the calculation of survival rates.

The procedures are included in SPSS data, an interface program for users working with Tandem's Data Definition Language and its Enform report generator language. The program generates an executable SPSS instruction file through a one-line command.

American Research Corp.'s SPSS Data Analysis System costs $20,000 with a $5,000 yearly renewal fee. Additional nodes costs $1,000 for the first year and $500 for subsequent years from 4465 Grinnell Ave., Boulder, Colo. 80303.

Tymlabs Offers 'Look/3000'

AUSTIN, Texas — Tymlabs Corp. has announced Look/3000, an application profile generator for the Hewlett-Packard Co. HP 3000 computer.

The product, which was developed by Wick Hill Associates, Ltd. of England, reportedly allows observation of a program as it is being executed, pointing users to areas of greatest potential time saving.

The Look/3000 generator costs $4,000 from Tymlabs at 211 E. 7th St., Austin, Texas 78701.

T/S Useful, But Beware

(Continued from Page 57)

If I take a system in-house, will I continue to get support? Just as users become dependent on software, they may require the services of the programmer down the road. However, some time-sharing firms want you to work on their hardware or not work with them at all. In that case, find somebody else.

Will the time-sharing firm customize my software? The firm that only sells you off-the-shelf software may present obstacles when requirements for those "slight changes" come pouring in.

Does the company stick to only one manufacturer of hardware? We all have our favorites, but no hardware is best for every application.

Hoffman is an account executive with Goldata Computer Services, Inc., in Bryn Mawr, Pa.

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March 2, 1983

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	Description	Purchase Price	Per Month 12 Mos	24 Mos	36 Mos
DEC	LA34 DECwriter IV Forms Ctrl.	$1,095	$105	$58	$40
	LA100 Letter Printer RO	1,995	190	[illegible]	72
	LA120 DECwriter III KSR	2,295	220	122	83
	LA120 DECwriter III RO	2,095	200	112	75
	LA12A Portable DECwriter	2,350	200	135	[illegible]
	VT100 CRT DECscope	1,695	162	90	61
	VT101 CRT DECscope	1,195	115	67	43
	VT125 CRT Graphics	3,295	315	185	119
	VT131 CRT DECscope	1,745	167	93	63
	VT132 CRT DECscope	1,995	190	106	72
	VT18XAC Personal Computer Option	2,395	230	128	86
TEXAS INSTRUMENTS	TI745 Portable Terminal	1,595	152	85	58
	TI765 Bubble Memory Terminal	2,595	249	138	93
	TI940 CRT	1,795	173	96	65
	TI785 Portable KSR, 120 CPS	1,795	172	96	65
	TI787 Portable KSR, 120 CPS	2,195	211	117	80
	TI810 RO Printer	1,895	182	99	63
	TI820 KSR Printer	2,195	211	117	80
LEAR SIEGLER	ADM3A CRT Terminal	595	57	32	22
	ADM5 CRT Terminal	645	62	35	24
	ADM32 CRT Terminal	1,195	112	65	42
C. ITOH	CIT-101 CRT	1,525	147	82	55
	CIT-161 Color CRT	2,675	257	143	97
	CIT-427 Color Graphic CRT	3,095	297	165	112
TELEVIDEO	910 CRT Terminal	650	62	35	24
	925 CRT Terminal	850	82	46	31
	950 CRT Terminal	1,075	103	57	39
NEC SPINWRITER	Letter Quality, 7715 RO	2,695	259	144	98
	Letter Quality, 7725 KSR	3,195	307	171	115
GENERAL ELECTRIC	2030 KSR Printer 30 CPS	1,195	115	67	43
	2120 KSR Printer 120 CPS	2,195	211	117	80
EPSON	MX-80 F/T Printer	745	71	42	27
	MX-100 Printer	[illegible]	85	48	32
TIMEPLEX	E9400 4 Channel Stat Mux	1,525	147	82	55
	E9600 8 Channel Stat Mux	2,095	197	110	74

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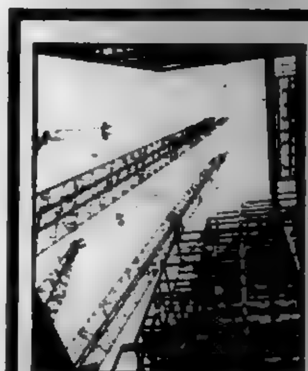

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The Westin Galleria Hotel
DENVER, CO APR 20 PM
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Hyatt Regency Louisville
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MINNEAPOLIS, MN APR 5 PM
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MONTREAL, PQ MAY 18 AM
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NASHVILLE, TN MAY 3 PM
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NEW ORLEANS, LA MAY 6 AM
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SEMINAR FORMAT: The Seminar is designed to give both End Users and DP Professionals a complete overview of FOCUS. It is comprised of two 90 minute sessions with a coffee break in between. The format is interactive and questions and discussion are encouraged.

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Three Utility Programs Out For Large Burroughs Users

JACKSONVILLE, Fla. — Jacksonville Software Services, Inc. has announced three utility programs for Burroughs Corp. large systems users.

Intersort reportedly enables the user to sort any disk file by entering parameters at a video terminal. Sorts can be accomplished on up to nine keys. It costs $695.

Interquery is said to allow the user to examine and modify data in any selected disk file. Data can be specified for video terminal display in display or hexidecimal formats as specified. Interquery costs $695.

Cryptolock is a file encryption system priced at $1,295 from the firm at Suite 234, 7555 Beach Blvd., Jacksonville, Fla. 32216.

Personnel Management Package Runs on Univac 1100 Series

CHICAGO — SMS Management Systems has announced the Human Resources Management System (HRMS), an on-line package for the Sperry Univac 1100 series.

HRMS maintains data for most functional areas of personnel, including flexible benefits, succession planning and medical history, a spokesman said. Update and inquiry is on-line.

All system functions are performed under Mapper.

Individual password protection is provided for basic personnel information, benefits and salary administration, career planning and medical, safety and minority affairs information.

The basic system is available for $75,000 until June 31 and thereafter for $150,000 from SMS, which is located at 1N628 Ethel St., Chicago, Ill. 60185.

'Tell-A-Graf' Adds 32-Bit Versions

SAN DIEGO — Integrated Software Systems Corp. has announced the addition of three 32-bit minicomputers to the family of machines upon which the company's Tell-A-Graf and Disspla graphics software can operate.

The packages are now available for Digital Equipment Corp.'s VAX-11/730, Prime Computer, Inc.'s 2250 and Apollo Computer, Inc. computers. The software interfaces to more than 135 graphics output devices, including plotters, printers and slide-making machines, according to a spokesman. It is also available for systems from Burroughs Corp., Control Data Corp., Honeywell, Inc. IBM and others.

Either package costs $9,500 with volume discounts available from 10505 Sorrento Valley Road, San Diego, Calif. 92121.

A/P Package Out for Wang

RICHMOND, Calif. — Soft Pro System, Inc. has released an accounts payable package written in Cobol for the Wang Laboratories, Inc. VS system.

The package reportedly prepares the disbursement of checks and maintains a trial balance of unpaid invoices.

A stand-alone package, it can also be integrated with a general-ledger package and was designed for multicompany and multidivision environments, the vendor spokesman said.

Features include on-line interactive vendor record maintenance, batch voucher entry and validation control, accounts payable to general ledger distribution and report and duplicate entry control.

The package is priced at $1,000 from Soft Pro System, located at 4121 MacDonald Ave., Richmond, Calif. 94805.

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Mortgage Lenders Ask DP to Meet Demands

By Gerry C. Nelson
Special to CW‡

The intense competition for capital, combined with deregulation and increased demand, makes the '80s a challenging time for companies in the mortgage-lending industry.

With all of the uncertainties, competition and need for current information, more and more mortgage lenders are looking to the computer as a useful tool to aid them in the future.

It is a reasonable statement that any mortgage lender today can afford a computer. The size and capability of the computer is determinable by factors of volume, number of branches and range of services of the installing institution.

Unfortunately, a corresponding and perhaps disproportionate cost of personnel has more than offset the decreased cost of computer equipment. This increase in cost becomes evidenced in the following two areas: operating personnel that could be made more productive through automation and the data processing "expert" that can implement solutions to current manual processes.

Traditional Fears

One of the greatest deterrents to the implementation of computer technology in mortgage lending is the traditional fear of data processing departments by mortgage lending personnel.

Fear that the data processing people will cost too much, do too little and misuse the money invested in nonproductive applications of the computer is common. Most mortgage lenders have had negative personal or second-hand experiences with pie-in-the-sky promises from data processing wizards.

Large corporations have historically hired their own data processing experts and developed the computer applications with their own staff. The major advantage of this in-house approach is the customization or tailored implementation to your environment. Non-data-processing personnel will not have to change to fit the computer system — unless you feel the change is more productive. If the computer implementation is done in a timely fashion, custom-built systems provide greater benefit and are used more than other alternatives.

Unfortunately, in-house developed systems usually are not completed in a timely fashion. Cost overruns in computer implementation are generally the rule, rather than the exception. Quite often these overruns are caused by the tremendous backlog of requests already submitted to an overloaded data processing staff. Another cause could be that the implementers do not understand the needs of the users.

More significantly, in-house systems usually cost three to four times as much as turnkey packaged solutions at the outset. There is also a continuing management and financial responsibility for their on-going maintenance. Keeping the in-house system current often costs as much as the initial development.

The last five years have seen a tremendous increase in companies that specialize in already programmed mortgage lending solutions. Some firms sell both computer equipment and the application solution, others provide solutions running on their own service bureau computers and others sell just the software.

Regardless of your choice, the benefits to this type of computer implementation are similar. A reasonably rapid implementation of the package (one to six months) is one very important benefit. This is possi-

(Continued on Page 68)

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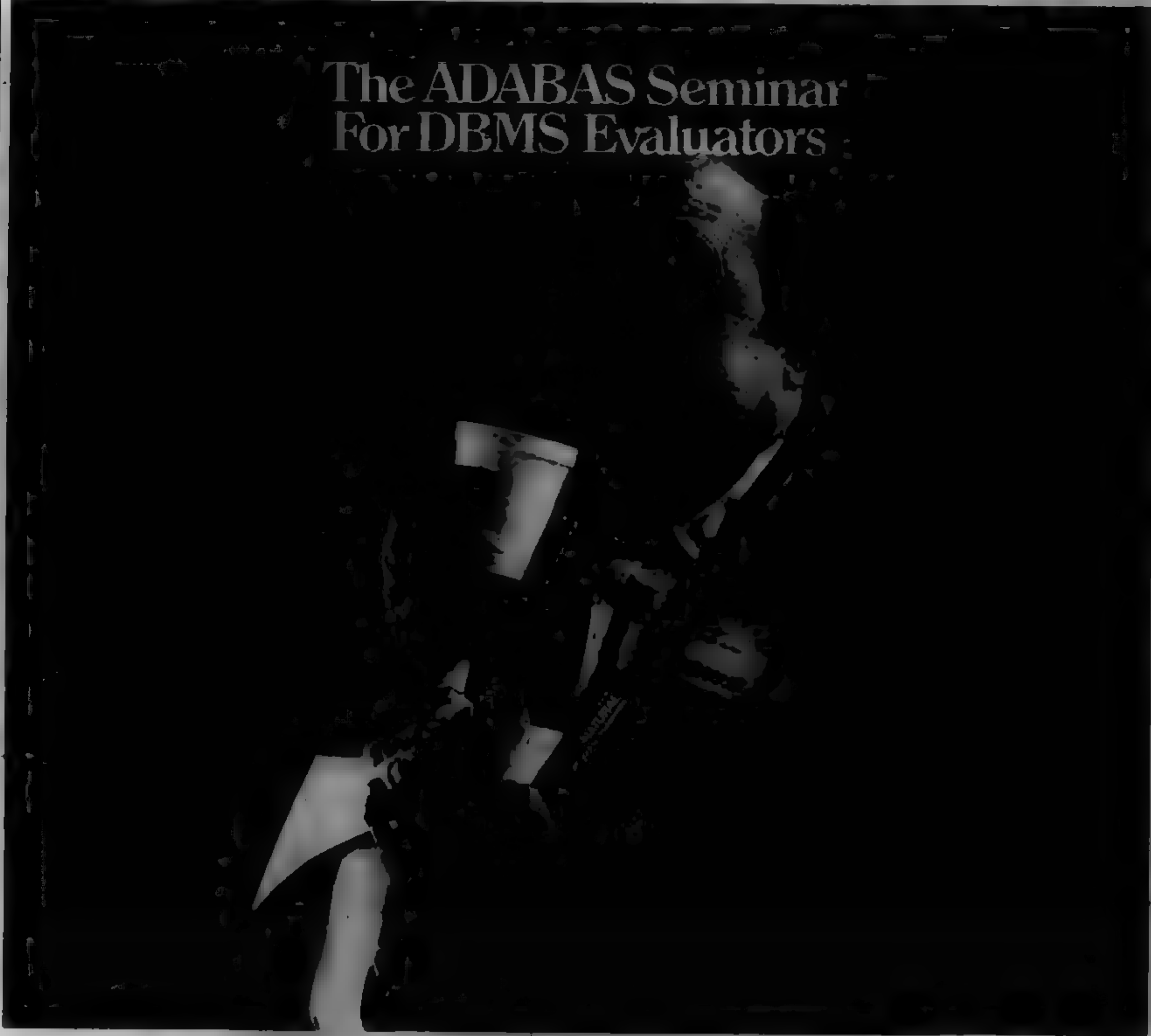

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Employee Transfer Corporation they're installing what Steve Qua[illegible] calls, "the [illegible]tion business [illegible] info[illegible]

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Mortgage Lenders Shake Past Fears About DP

(Continued from Page 65)

ble because the programming has already been completed and is already operational at some other customer location. Having a system already operational takes the guesswork of how it will work out of your decision process. Generally speaking, the cost of purchased solutions will be considerably less expensive than in-house custom-developed solutions.

If your organization does business exactly the way another already installed package user does business (same states, same input documents, same output reports, same procedures, same management style), the package solution is ideal for you. If, however, there are differences, you will find implementation of the package somewhat traumatic. The most significant problem will be that you will have to change your organization to fit the parameters of the system.

The net result will be that the system will be resented and ultimately rejected by the users of the system — the ones it was supposed to benefit. Another serious problem is that after the system is installed it is very difficult to change to fit the dynamic needs of the user.

Of the small number of vendors that offer "tailorable packages," each provides some preinstallation definition techniques, from a simple solution of options, to table definitions or all the way to a complete "cookbook," fill-in-the-blanks methodology. This approach has tremendous possibility for the mortgage lender shopping for a computer solution.

A user-definable package can parallel the benefits of an in-house system, while keeping the risks and costs of implementation to a minimum. The greater degree of flexibility in user definition, the more likely the implemented system will fit the organization's needs.

Properly designed computer applications can significantly improve the probability of productive use of the system. A flexible system will also allow the continual modification of the operational system to keep it current with the dynamic needs of the organization (something the turnkey packages often overlook).

Properly designed tailorable systems should offer a range of computer equipment on which to operate so that large or small institutions can afford and benefit from their use.

If an in-house data processing staff exists, the tailorable package should conform to its standards and requirements. The purchased system should be maintainable by the in-house staff if one exists or through user definitions and vendor support if one does not exist.

Nelson is president and chief executive officer of Symbolics Financial Systems, Inc., a Richardson, Texas, firm that provides computer software to the mortgage lending industry.

Tymshare Offers Phone Service

CUPERTINO, Calif. — Tymshare, Inc. has announced a toll-free number for customers who encounter problems with equipment leased or sold by the company.

Through an agreement with Texas Instruments, Inc., Tymshare has set up a centralized maintenance dispatch program in which TI will handle maintenance calls and correct equipment problems experienced by users of Tymshare-supplied terminals, printers, microcomputers, modems and other hardware.

The service will be available by mid-March. The phone number for all states except Texas is (800) 231-3128. In Texas, the number is (800) 572-3300.

Accounting Tool Fits System/34

LITTLE ROCK, Ark. — Arkansas Systems, Inc. has introduced an Automated Trust Accounting System for the IBM System/34.

The system, audited and approved by the Federal Deposit Insurance Corp., produces more than 20 reports for monitoring daily Bank Trust Department operations. Internal reports are said to provide information on upcoming events such as trust reviews, bond maturities, coupon clip dates, dividends due and interests due.

Client reports — provided monthly, quarterly, semiannually or annually — include: transaction report; review of assets; portfolio distribution/stock distribution; and schedule of capital gains and losses.

The software costs $10,000, a spokesman said from Suite 202, 8901 Kanis Road, Little Rock, Ark. 72205.

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Bank Bucks Up Information Base With Package

CHICAGO — Like an athlete in training, the Sears Bank & Trust Co., a subsidiary of Midland Bank Corp., ran through its plays and then analyzed its strengths and weaknesses. By relocating recently from Chicago's West Side to the city's financial district, the $480 million bank was competing against some of the country's largest financial institutions.

"Management felt that some of the software in place was not at a level to compete with the group of banking institutions in the Chicago Loop," said Dennis Reidy, vice-president of data processing at the Sears Bank & Trust. "An overall upgrading of software was initiated as well as the automation of several manual systems, one being the analysis of customer profitability."

Sears Bank & Trust had efficiency problems when monitoring corporate customer profitability. Commercial loan officers believed their accounts were profitable, but their assumptions were not always based on current information.

Software Evaluation

The bank was led to the Customer Information File (CIF) and Customer Profitability Analysis System (Cpas) from University Computing Co. (UCC) of Dallas. Software evaluation committee representatives found that out of four major financial software vendors studied, UCC was the only firm in '78 to tie profitability to a customer information file system.

"That criterion was important," Reidy said. "By installing both UCC systems, we wouldn't have to rethink the process for profitability when initiating and establishing new customer relationships on file. One area of the bank would be able to control simultaneously the opening of a file and the creation of profitability relationships through one centralized system."

Cpas was installed on an IBM 4341 running DOS/VSE. "DP found the Cpas system easy to install and maintain," Reidy said. "It is written in Cobol and is very modular, which facilitates subsequent modification."

With Cpas, the bank can maintain a timely profitability profile on hundreds more customers than was possible before, Reidy said. Previously, only 70 accounts were monitored manually; Cpas enabled that number to grow to 900. Reidy added, "With the manual system, an analysis of customer services was produced about every three months, annually or when a customer had a loan application appearing before the review committee. Now the customer profitability analysis is produced monthly, yielding current, on-line information in summary or in detail for the most recent month.

"Cpas does not make the decision of whether or not to lend," Reidy said. "It enables loan officers to react to applications quickly since the research to check a client's profitability and past lending history is eliminated.

"The system reports the cold facts such as the customer's average balance over the past year, if the customer's business is cyclical and whether he has honored previous deposit commitments or compensating balance agreements. This on-line data retrieval is possible because Cpas allows a considerable amount of customer history to be stored. The Sears Bank stores 25 months of history for each of its 900 Cpas-monitored clients," he added.

Before the installation, three clerks in the operations department had required at least 20 days after the close of each month to prepare 70 demand deposit analysis statements. With Cpas, their data gathering role ended. Previously, the clerks had fallen a month behind in the preparation; they now take on a verification role as Cpas completes the 900 current statements within five days from the month-end closing.

Cpas also is used to verify what deposit or compensating balance agreements, which are written at the beginning of the bank/customer relationship, are being honored. "No other system we saw provides the bank with a profitability picture of its customers that includes all their relationships and agreements," Reidy said. "For example, a customer may agree to keep a balance of $50,000 to offset the cost of maintaining the relationship. If he goes high on activity and low on the balance, the yield is down for the bank and we lose profit. Now, Cpas reports these fluctuations in time so management can react to the situation."

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Financial Modules Out for HP 3000

ARLINGTON HEIGHTS, Ill. — Bakco Data, Inc. has developed 12 modules of Warehouse Distribution and Financial Control Applications for Hewlett-Packard Co., HP 3000 computers.

The firm utilized HP's Image Data Base Management System, along with Quasar Systems Ltd.'s Fourth Generation Application Generator language in translating its Digital Equipment Corp. On-Line/Interactive/Multi-Processing Applications for HP.

Bakco's method reportedly allowed the work to be done in 20% of the projected time. The 12 modules cost $4,000 to $8,000 each from Suite 190, 85 W. Algonquin Road, Arlington Heights, Ill. 60005.

Text Editor Runs on Prime

SOUTH PASADENA, Calif. — Shirley Software Systems, Inc. has released a full-screen text editor for use on Prime Computer, Inc. machines.

Directed is cursor-controlled with on-line, interactive word processing capabilities. It is said to operate on a variety of terminals and to generate user-defined commands.

The editor carries a one-year warranty with maintenance available after that for 10% of the original purchase price. Directed costs $4,000 for a permanent license and is available on a lease basis from Suite 208, 1936 Huntington Drive, South Pasadena, Calif. 91030.

'Network Manager' Targets System/38

SALT LAKE CITY, Utah — GCI Information Systems, Inc. has introduced an integrated accounting, billing, traffic and reporting package for common carrier resellers using the IBM System/38.

Called Network Manager, the package consists of program modules.

The package is available for a $75,000 one-time license fee. A service bureau arrangement is also available through P.O. Box 6439, 1137 E. 2100 South, Salt Lake City, Utah 84106.

'Quicklib' Aids HP 3000 Users

SAN LUIS OBISPO, Calif. — Computer and Software Enterprises, Inc. has announced software said to facilitate Hewlett-Packard Co. HP 3000 users in building, maintaining and reporting Ksam Cobol copy libraries.

Quicklib is said to be accessible directly from the prompt of either HP's editor, Edit/3000 or Robelle Consulting, Inc.'s Qedit.

This method of access reportedly allows programmers to switch between editing programs and editing or listing copy library elements.

Quicklib is available for a one-time price of $1,500 or on a rental basis for $300 per six-month period, according to a spokesman. The vendor's address is P.O. Box 1766, San Luis Obispo, Calif. 93406.

Horizon Systems Announces Testing Service

RESTON, Va. — Horizon Systems Corp. has announced a quality assurance measuring and testing service for software that is purchased or developed in-house.

Tests and reviews are formally designed for three milestone points: following requirements analysis, after the design documents are complete and after implementation but prior to acceptance by the sponsor.

Acceptance testing consists of three components: hands-on functional testing, performance testing and documentation review.

Prices start at $2,500 and range from 8% to 10% for large applications, according to a spokesman for the firm.

Horizon Systems can be contacted at Atrium 6, 11250 Roger Bacon Drive, Reston, Va. 22090.

Micro Notes

The Software Link, Inc. has announced **Multilink**, a product that is said to convert IBM's PC-DOS on the IBM Personal Computer into a multiuser, multitasking operating system. The package allows the Personal Computer to support up to eight terminals. It costs $200 from 6700 23-B Roswell Road, Atlanta, Ga. 30328.

EMS, Inc. has announced the **CP/M Connection**, the **DOS Connection** and the **CP/M-86 Connection**, products that are said to allow applications developed under the UCSD P-system to run on Digital Research, Inc.'s CP/M and CP/M-86 and Microsoft, Inc.'s MSDos operating systems. In most cases, no modification or recompilation of the source code is required, the company claimed. Each package costs $100 from 5496 Haussner Drive, Concord, Calif. 94521.

Daystar Systems, Inc. has announced **Ultratrap**, a parity error-handling utility program; **Ultrafast**, a flexible disk random-access memory emulator; and **Ultraboot**, a dynamic memory allocation utility for the IBM Personal Computer. The three-program utility package costs $40 from Suite L, 10511 Church Road, Dallas, Texas 75238.

Data Node, Inc. has added two utility files and an application package to its DN 82 hardware converter that is said to convert any standard RS-232 terminal into a Zilog, Inc., Z80A-based microcomputer running Digital Research, Inc.'s CP/M operating system. **Config** gives the user the ability to configure hardware through the software. **Remem** can restore from memory any program that has just been run. **Calccost** is a cost projection application that allows instant computation of materials and cost for any product or project. The programs are bundled at no extra charge into the DN 82 package, which costs $1,995 from Suite 103, 1440 Koll Circle, San Jose, Calif. 95112.

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POWER POLITICS

(or How I Learned to Stop Worrying and Love Technical Leaders)

By Gerald M. Weinberg

The workshop was "Becoming a Technical Leader." The subject was power.

"Power comes from position," Austin said for the 10th time. "Until my promotion, I couldn't make things happen in my organization."

"Not so," Kevin said. "Before I was promoted, I could really accomplish things because of my technical skill. Now I can't even use that."

"I disagree with both of you," Isabelle said. "Technical skill may help when you are a low-level employee, but unless you have personal power, promotion to the supervisory ranks won't do anything."

This had been going on for three hours, getting nowhere. I interrupted. "My own personal power is sinking fast. Since I'm in charge here, I'm going to use some of my positional power to call a time-out. Besides, if we don't hurry we'll be late for the movie."

The movie was *E.T.* — the tale of an extraterrestrial's encounter with earthlings. I couldn't get my mind off the subject of power, which must have influenced the way I saw E.T.'s predicament. When his spaceship makes a hasty departure from earth, E.T. is accidentally left behind, the perfect symbol of powerlessness.

E.T. is naked. He has no tools. He is lost in an alien environment, light-years from home. All this is bad enough, but people will not leave him alone. The entire U.S. government is determined to capture E.T. so he can be dissected like a laboratory frog. And so the plot is set — a power struggle between "the greatest nation on Earth" and one lost, naked midget.

But E.T. is not a suspense movie. From the beginning, I was willing to bet that the government never had a chance. I knew that — and every kid in the audience knew that. What made the movie so much fun was that nobody in the government knew.

We discussed the suspense angle at dinner. Austin was perplexed. "How did you know E.T. would win? I thought the government had all the power."

"Not against E.T.'s personal power," Isabelle replied.

Kevin corrected her. "Not personal power. E.T. had a superior technology."

"Personal power? Technology? I'd call it magic. It was unrealistic."

"Not unrealistic," I said, "merely unrecognizable."

"What do you mean?"

"It's called Clarke's Third Law: Any sufficiently advanced technology is indistinguishable from magic."

Kevin clarified this. "It's just like managers and programmers. To my manager, my technical work is pure magic."

"Well, it works the other way, too," Austin said. "We managers have lots of organizational power, which you programmers don't understand. We can mobilize resources to get things done. Don't underestimate the power of managers."

"You sound like those bureaucrats in the movie."

"No name-calling," I said. "Austin and his managers are frustrated because the programmers don't play by the rules of their power game. The programmers are not in a power struggle: They just want to write programs. E.T. is not in a power struggle: He just wants to go home. Once E.T. decides he has to go home, the government is powerless."

"But where does programmer power come from?" Austin asked.

"Wasn't it Victor Hugo who said that nothing in this world is as powerful as an idea whose time has come? In our time, the idea is technology, especially information processing technology. The programmer partakes of this technology power, in the same way that E.T. tapped into some mysterious life-force. The only difference is that E.T. knew what he was doing, while programmers usually do it unconsciously. The typical programmer takes technology power for granted — until is disappears."

"Like when he becomes a manager," Kevin said, "and his brain goes soft."

"Kevin, I think your view of power is too simplistic for you to understand why programmers often lose power when they decide to accept supervisory positions — positions of power. Let me lecture you on the nature of power as a relationship."

"Does it have to be a lecture?" Isabelle asked.

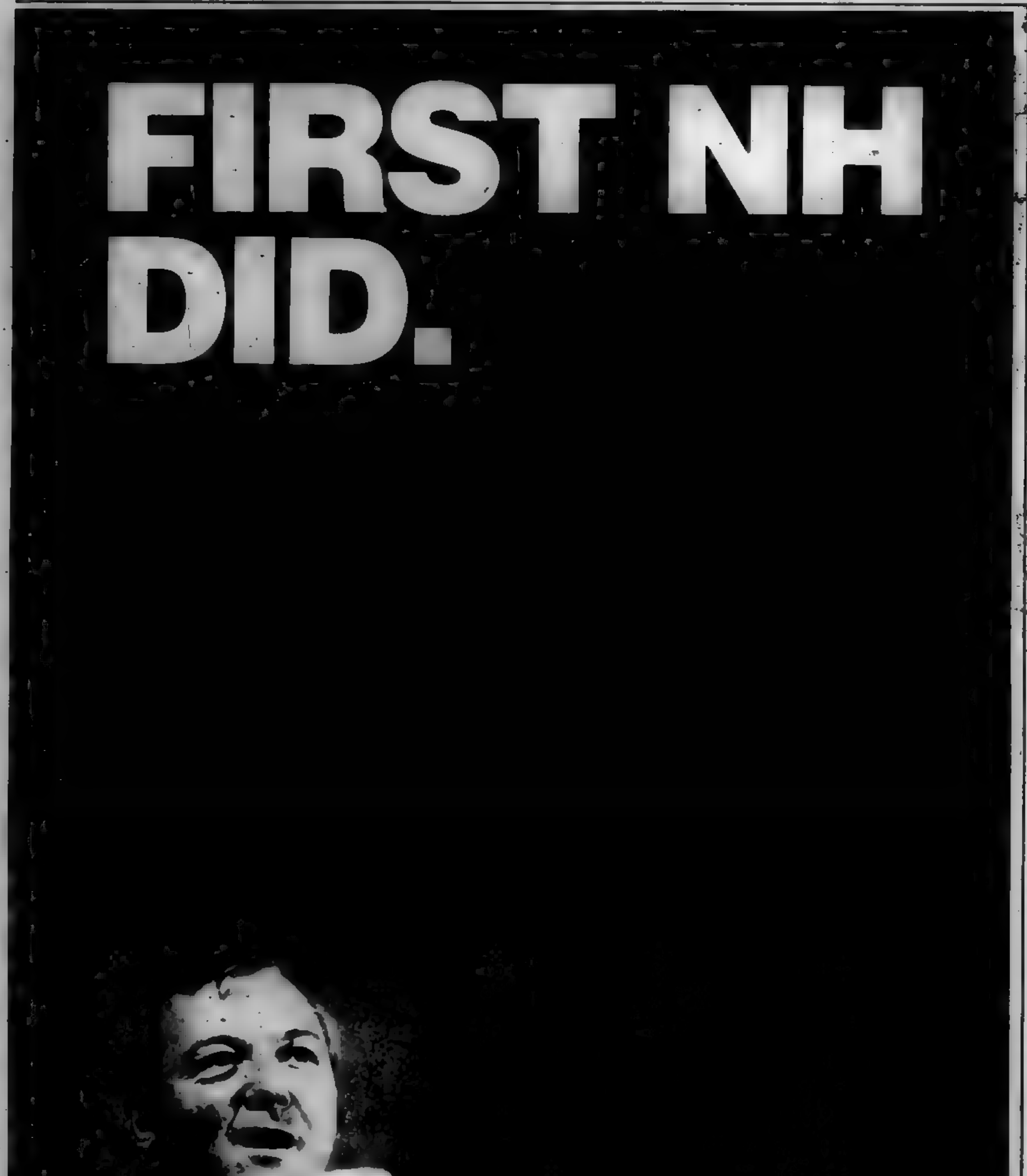
"All right, let me tell you a story."

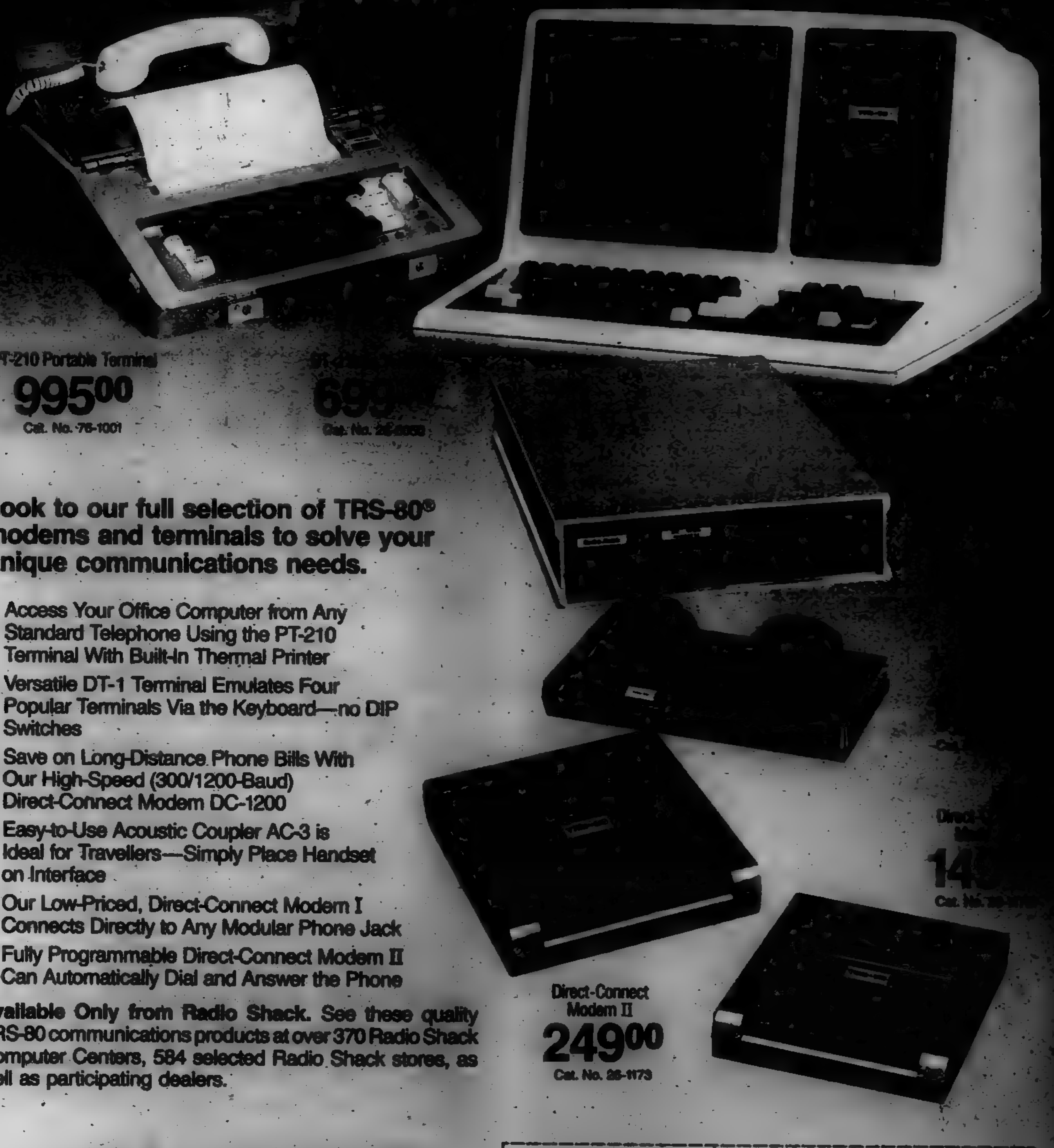
Power as a Relationship

"'Once upon a time, I walked out of a tedious planning meeting because I felt incapable of accomplishing anything. After the meeting, the chairman confronted me in my office and accused me of irresponsible use of power. *He* would never have the nerve to stand up and leave a meeting, no matter what was happening. To him, my leaving meant I possessed unimaginable power, while to me it meant I was powerless. To me, his being appointed chairman meant he was obviously the one who had all the power.

"We were both wrong, because we both thought power was something we possess. Power is not a possession, but a relationship. I saw the chairman as powerful because of my relationship to the organization that appointed him. I depended on the organization. It can take away my livelihood — it must be powerful. The less dependent I am, the less powerful the organization seems.

"The chairman thought I was powerful because he projected his own situation on me, as if I were a movie screen. When I acted in a way that would have required power from him, he concluded that I was a powerful person. If a woman had left the meeting in the same situation, he might have seen her as weak. Instead of identifying with her personally,





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he might have used her as a screen for one of his female stereotypes."

Programmer Power

"Then your theory," Isabelle asked, "is that nobody possesses power? Is it like love — something you only have with other people?"

"Very much like love."

Kevin disagreed with us. "That sounds too abstract for me. You just do not want to admit that an expert programmer like me possesses something that you do not have."

"You do possess something, but it's expertise, not power. Any power you get from that expertise is based on a relationship between you and someone else. If you were the leader of a mountain climbing team, your programming expertise would contribute no power at all."

"But I'm not the leader of a mountain climbing team. I'm the leader of a programming team, so my expertise *is* power."

"It may be, in your particular team, but it doesn't have to be on all teams. It depends on the relationship of the leader to the other members of the team."

"Give me an example."

"If your team consists of novice programmers," Austin said, "your expertise will give you considerable power. But if the other team members are also experts, they will attach less importance to your technical expertise. In that case, they will pay more attention to organizational power — like the power to acquire an extra terminal, to extend the schedule or to capture a more interesting assignment."

"I may owe you an apology, Austin. I'm beginning to see how we can both be right at the same time. It's perplexing, though."

"The idea of power always seems to have this puzzling aspect," I said, "because people aren't used to thinking in terms of relationships."

"Like when I was promoted from team member to team leader? I definitely experienced a loss of power, which is why I strongly disagreed with Austin's argument."

"Exactly. Your expertise didn't change, but it wasn't very important because other people's expectations changed."

Kevin laughed. "I struggled to show the team that my technical skill hadn't diminished, but all I did was convince them I was a weak leader."

"Of course," Isabelle said. "If you really have power, you don't have to struggle to show it. That's what personal power is all about."

"If that's what happens when we try to acquire power," Austin asked, "how are we supposed to go about it?"

"I don't care about acquiring power, but I don't want to lose the power I have," Kevin said.

"How can I get more responsibility without losing my power to get things done?"

"The answer should be obvious," I replied, "but I don't think you two are going to like it. Isabelle is on the right track. The first step in keeping power is to stop trying to hang onto it."

"You always talk in paradoxes."

"It's not a paradox. The desire for power is not a desire for a thing, but for a relationship. . ."

". . . and you don't keep or build relationships the same way you keep or build things," Isabelle added.

"I still don't understand," Kevin said.

"Consider this. You want something, but you haven't figured out what it is. You think you're dissatisfied because you don't have the power to get what you want, but the problem is that you can't visualize what you *really* want."

"So as long as I'm blinded by this illusion, I'm in danger of losing power whenever something changes?"

"If you don't know what you want, power is useless to you."

"So if I concentrate on what I want, power will come to me?"

"Not necessarily. Concentration is necessary, but even when you concentrate, you may not be able to prevent the loss of power."

"Then what else do I have to do?"

"If you keep asking that, you are too blind to understand the answer. Don't seek a promotion to get power. Step away from the lure of power and learn more about yourself."

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> *'When you see a chance for power, ask yourself what you want power for. If you don't know, you are sure to falter and lose your way when your old power starts to crumble — and it must before your new power starts to grow.'*

"That's what I meant by personal power," Isabelle said.

"It makes sense to me now," Kevin said. "I really had no idea why I accepted a promotion, but I was flattered by the idea of being made powerful."

"So when you see a chance for power, ask yourself what you want power *for*. If you don't know, you are sure to falter and lose your way when your old power starts to crumble — and it must before your new power starts to grow."

"That reminds me of E.T.," Isabelle said. "He didn't want power. But because he knew what he really wanted, he beat the 'powerful' at their own game."

"I still don't understand," Austin said.

"E.T. really wanted to go home," I said. What do you really want?"

Good Things Leaders Do

Being a leader is tough, but becoming a leader is even tougher. Our workshop was designed to help people through this difficult transition.

The fundamental method is simulation. Anything is tricky the first time it is done. Simulation allows us to experience the thoughts, emotions and mistakes of a new situation without worrying too much about what it will cost if we bungle — or what other people will think.

Absence of Leadership

The first simulation is called "Getting Yourselves Organized" (GYO). After a brief introduction, the workshop participants receive a written description of their assignment — to organize themselves into teams and to arrange the furniture to create a learning environment for the coming week. It usually takes 20 people about three hours to do this. Some groups finish in as little as an hour. One group took four days.

The GYO simulation was designed to teach people about leadership. It is all around us, but when you ask someone to define leadership, he always seems to have trouble. The GYO simulation is like taking a fish out of water — the fish suddenly notices what was there all along. Then it struggles and gasps, trying desperately to get the water back.

When the simulation is finished, many participants are discouraged that it took so long to perform such a simple task. They seem to want to forget the experience as quickly as possible, but my job is to be sure that, regardless of their feelings, they learn from the simulation. Rather than dwell on failure — which is inevitable — I insist that each person come up with at least one personal act of leadership that took place during the simulation.

At first, the participants have difficulty thinking of anything. Not used to thinking about the components of leadership, they are discouraged. But with a little prompting, they soon get ideas. In 50 classes, nobody has ever failed to come up with an act of personal leadership.

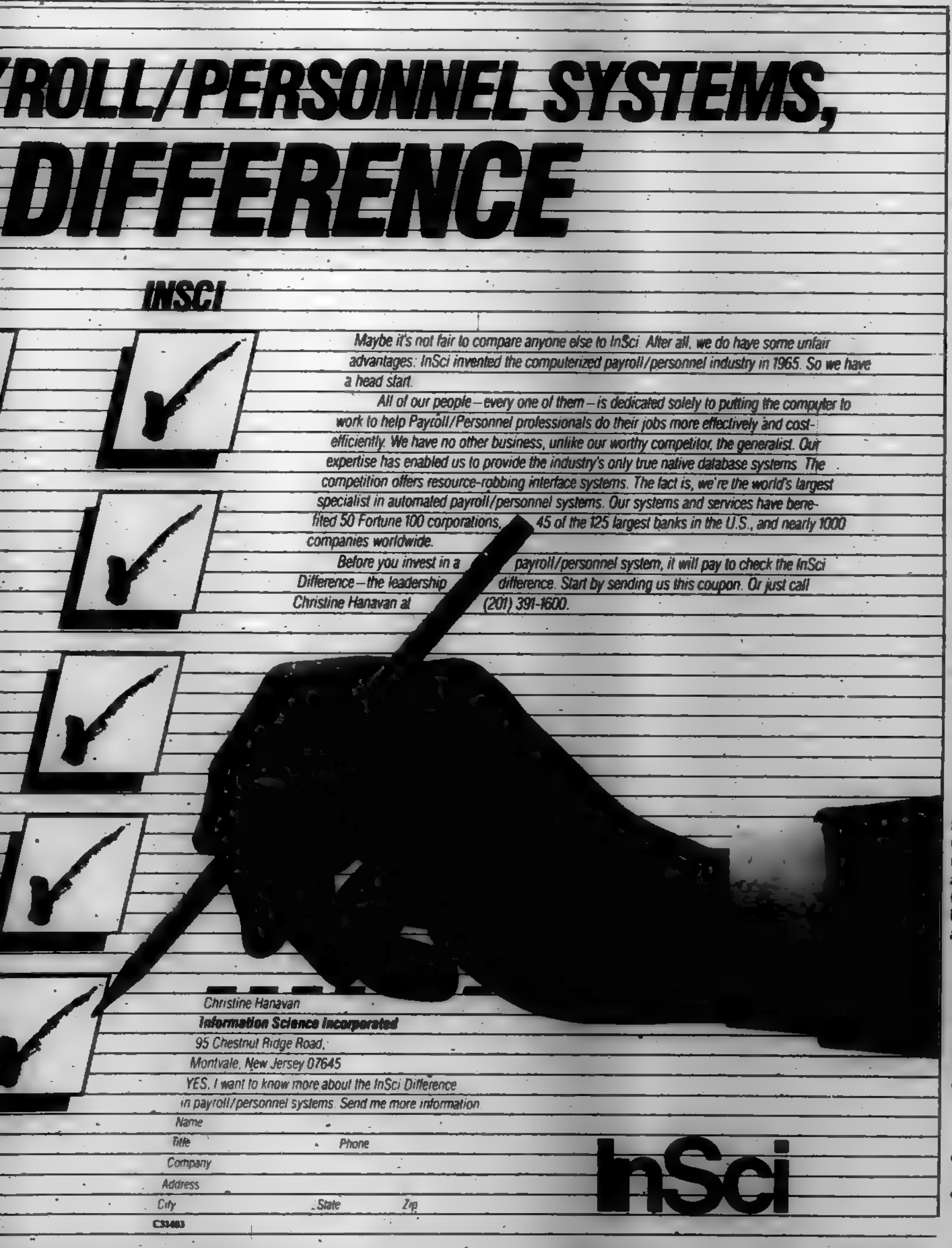
During a recent class in Japan, I recorded all the responses in order to make cross-cultural comparisons. Even though it was a different culture and even though (unfortunately) there were no women in the class, the responses were typical of other classes.

List of Leadership Actions

The responses are listed in the order in which they came up:

1. "I took the risk of opening discussion on a new topic."

(Continued on In Depth/7)



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Do Technical Leaders Get Rich?

As T.S. Eliot said, "April is the cruellest month" — especially if you have not kept good income tax records. I was so busy making money last year that I did not keep track of where it was going. So last April, I attended an evening tax seminar offered by a local broker.

The seminar was packed. During the intermission, I saw my old friend, Oran.

"The last time I saw you, you were in the workshop on 'Becoming a Technical Leader.' "

"After that, I went to corporate headquarters to accept a promotion to my first management job."

"Oran, you are a mental marvel. I could use you to keep my tax records. Things have gotten a little out of hand — which is why I'm here tonight."

"It's not a bad seminar; actually. I particularly like the information lists they've distributed on tax shelters."

"But why are *you* here, Oran? I can't imagine that you, of all people, have not kept good tax records."

Oran grinned. "No, of course that's not the reason. The problem is that I have managed to accumulate a little excess cash, which I would like to invest with a minimum of taxes."

"I guess your promotion was profitable," I said.

"You must be kidding?"

"But I thought you got a big raise."

"My raise was $303.56 a month."

"No wonder you're looking for tax shelters."

"I'm afraid you're making the same mistake I made, much to my regret."

"What mistake?"

"You are looking at the gross, not the net. Here, let me show you."

Before I could move away, Oran pulled out a pen and a piece of paper. "First, of course, there are taxes. If I remember correctly, my deductions went up by $136.56."

"Just round it off, Oran."

He wrote down $137. "That was just the most direct and obvious expense. In order to live up to my new image, I had to get rid of my '65 Beetle. Do you realize how much new cars cost today?"

"Be reasonable, Oran. That Beetle wasn't going to last forever."

"Yes, but it had a few more good years — and it was fully paid for and depreciated. The new car had a monthly payment of $216."

He wrote $216, but I objected. "You really cannot attribute all of that expense to your new status as manager. You have a new car, which is worth more than the old one . . ."

". . . and also costs a lot more to run. But you're right." He crossed off $216 and wrote $100. "And that's a conservative estimate, just of the prestige cost. I'll have to add another $40 a month for gas, plus $25 dollars for parking."

"But you had to park the Beetle, too," I pointed out.

"I got a special rate for small cars. The regular rate is $25 higher."

"What about gas? Isn't mileage better on new cars?"

"Better than the old big cars, but not better than my Beetle. Besides, I used to bike to work a couple of times a week. After the promotion, I couldn't do that."

"Why not?"

"First of all, it isn't seemly for management. Second, managers wear suits, not sweat suits. And third, managers work late several nights a week and who wants to bike home in the dark when you're late already?"

"It is hard to imagine you wearing a suit to work."

"I had to buy three right away. My clothing bill went up about $50 a month." He added $50. "And working late really adds to expenses."

"How?"

"First, there's the eating out, which amounted to about $60 a month. Then there was extra baby-sitting when my wife was out for the evening, too. We figured an extra $50 a month, conservatively."

"Eating out a few nights a week isn't all that terrible," I said.

"It is if you have to run in, eat and run back to work. It kills the digestion and puts on weight."

"Well, I suppose not bicycling to work adds to the weight problem, too."

"Or it could have been the extra drinking. My booze bill climbed about $40 a month, though I don't think Scotch really cures tension headaches. It only puts them off until the next morning."

"You don't look as if you've gained an ounce," I said.

"I joined a health club — $40 a month plus towels — to control the weight. I don't have to put anything down for towels, though, because I never had much time to go there and work out."

"So what's the net of all this?"

"You can see for yourself," Oran said as he finished computing the total. He showed it to me:

Additional income	**$303.56 a month**
Taxes	**137**
Car payment	**100**
Additional gas	**40**
Larger parking space	**25**
Eating out	**60**
Baby-sitting	**50**
Extra booze bills	**40**
Health club	**40**
Additional expenses	**$492 a month**
Net loss	**$188.44 a month**

"Looks bad," I said, "but that was two years ago. By now you must have moved to a higher salary level. You said you had some extra funds to invest."

"Not from managerial salary. I kept all these figures in my head," Oran said.

"I can imagine."

"It was worrying me. I didn't know what to do about it. Imagination is not my strongest asset, you know."

"Well, I'm sure you underestimate yourself, Oran."

"No, I don't think I'd have figured out what to do if my 11-year-old daughter Elda hadn't caught chicken pox. She has a morning paper route, which I had to take over when she got sick."

"I can just see you getting up at 4:30 a.m. to ride around the neighborhood delivering the paper. How long did you have to do it?"

"That's the point. While I was riding around delivering papers, I had a lot of time to think. It was good exercise, which I didn't have to pay for. In fact, it paid me. By the time Elda was better, I had lost 8½ pounds and the headaches had gone away," Oran said.

"You didn't take your daughter's paper route, did you?"

"Of course not. What do you think I am? I got my *own* paper route. Besides, I can handle a bigger route than she can, so it pays more."

"I don't believe this, Oran. If you're so concerned about a manager projecting the right image, how can you risk being seen delivering papers?"

"It's not a risk. First of all, none of the right people are up that early. But I'm no longer a manager. I asked for my old senior programmer job back and got it."

"Did you have to give back the raise?"

"Yes and no. I kept the manager's salary, but lost one year's annual raise, which puts me a little ahead of where I would have been if I'd never taken the job in the first place."

"And that's where the extra funds come from?"

"Oh, no. Those are the savings from my paper route."

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(Continued from In Depth 5)

This response came from the first person who spoke during the simulation, when everyone was too discouraged to begin. He raised the question of what the group was really supposed to do. In Japan particularly, it is difficult to speak first in the presence of authority figures. In the U.S., there is usually someone in the group who is more than willing to serve this function, but many individuals never have the courage to do it.

2. "I gave the group a theory to use to watch its own development, a model that will change the way they see things."

This person made an early prediction of how the simulation would operate. He was only partially correct, but by making the prediction, he raised the possibility that the group could observe and predict its own actions — an essential leadership function.

3. "I compromised appropriately and did not compromise inappropriately."

It is easy to overlook the act of abstaining from action. This participant was conscious of having a personal point of view that he did not press. He felt that speaking up would only prolong the exercise, without contributing anything essentially better, so he kept his opinion to himself. Many would-be leaders are unable to withhold any idea that pops into their mind — their enthusiasm for their own ideas blinds them to the purposes of the group.

But other would-be leaders are unable to stand by their ideas in the face of conflict, even when those ideas may be positive contributions. Therefore, "not compromising inappropriately" is just as important as knowing when to yield for the good of the group.

4. "I observed everyone to see what needed to be done that was not being done, then did it or saw that it got done."

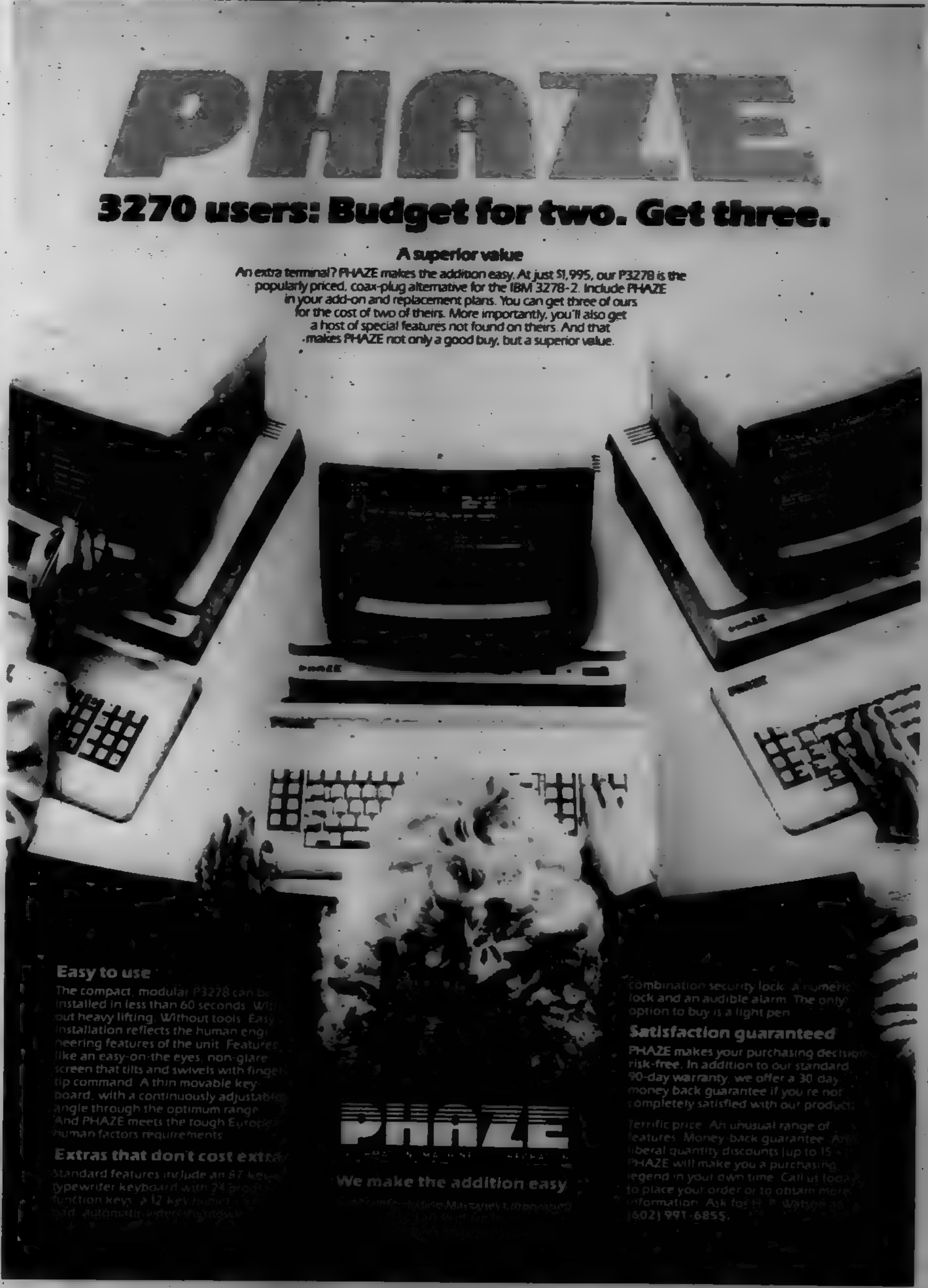
This may seem an obvious act of leadership, but much of the time, most of the participants were so busy moving furniture and arguing that they never took a good look at themselves. And those who did step back were often ineffective at sharing their perspective with the others.

5. "I restructured the task for more effective work."

This participant took the risk of seeking a redefinition of the problem. When the group was locked in a seemingly endless discussion over the location of a pair of tables, he observed that the assignment did not specify that the furniture could never be moved. The arrangement could be changed if circumstances changed. This suggestion concluded the argument and also abbreviated subsequent arguments.

6. "I restructured the group for more efficient work."

Once the teams had been chosen, this participant suggested that there was no need for the entire group to work on the complete arrangement of the room. Instead, an overall pattern was worked out, then each team designed its own work space to its own satisfac-



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tion, without interfering with the other teams.

7. "I made an inventory of resources."

When everyone was debating about how much furniture each team should get, this participant counted the furniture and reported his tally to the class.

8. "I asked questions."

This participant asked whether it was possible to obtain more tables and chairs or to remove some from the room. The anwer was yes, which greatly simplified the problem of an uneven number of chairs.

9. "I listened when everyone else was talking. I even listened when one person was talking."

How simple. If everyone listens when one person is talking, a situation in which everyone is talking at once will never arise. And if this troublesome situation does arise, what could possibly help more than keeping one's mouth shut?

10. "I watched for misunderstandings."

More than simply listening, this participant actively facilitated the group's communication process. If he detected a sign that a misunderstanding had occurred, he intervened by slowing down the process. He did not seek agreement on how to solve the problem, but only on what the problem was.

11. "I put myself in their position."

Empathy is another form of active listening. At one point in the debate over the room arrangement, this participant moved over to the part of the room occupied by another team, so he could see the problems they were having with his proposed solution. This was an embodiment of the empathy he displayed throughout the debate.

12. "I was ready and willing to do hard physical labor when necessary."

Although the assigned task required much talk and planning, it was necessary for someone to roll up his sleeves and move furniture. If leaders show unwillingness to do some part of the task, that part is labeled as low-status dirty work, which inevitably creates leadership problems later.

13. "I worked hard, but not so hard that I locked out feedback on the results of my work."

Nobody is clever enough to work perfectly all the time without corrective or confirming feedback. Feedback comes in many forms — sometimes shouted, but usually more subtle. Although it is essential for a leader to be absorbed in the task, it is also essential not to be so absorbed that the rest of the world is permanently shut out.

14. "I encouraged others in productive, but different behavior. I also encouraged others to continue the same behavior if it was productive."

Innovation carries risk, which is difficult to bear alone. Two or three words of encouragement from one person in a group can have a startling effect on one's willingness to risk a new behavior. But if only new behavior is encouraged, people soon get the impression that the only worthwhile contribution is to be constantly changing something.

15. "I withheld negative comments for a more appropriate time."

Though three positive words can encourage productive behavior, a single negative word can be devastating. In fact, it does not even require words — at just the right moment, a raised eyebrow or a snicker will suffice. If you want to discourage innovation, throw in negative reactions the instant they arise, but if you want to be a technical leader, learn to remain silent until a more appropriate time. And sometimes that time will never come, which is just fine.

16. "I offered ideas."

The key word here is "offered." Everyone realizes that leaders present ideas to a group, but the manner of presentation is often ignored. Some leaders impose their ideas on a group. Others bestow their ideas on the group, as if those ideas are somehow better than the ideas of ordinary mortals. Still others insinuate their ideas indirectly, as if the group is not mature enough to handle ideas presented directly.

This participant offered his ideas to the group. They were something

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he had to give, but only the group could decide on their worth. He was not committed to his ideas if they were not useful to the group.

17. "I admitted a mistake."

Some people believe leaders must be superhuman and never make mistakes. The problem is that human beings cannot identify with superhumans and certainly will not allow themselves to be led by them. Admitting mistakes gives others permission to make mistakes, which is actually permission to take risks. If you never do anything wrong, you never do anything.

18. "I had the courage to appoint myself leader, even though I might have been shot down."

Of all the ideas you can present to a group, the most risky is the idea that you might be the one to lead it. If the group rejects this idea, it is easy to believe that they are rejecting you as a person.

You must either be foolish or courageous to risk direct personal rejection by your peers, so most people approach leadership indirectly. At just the right moment, this participant went to the front of the room and started writing the group's ideas on the blackboard. Nobody shot him.

19. "I followed sensible leadership when it was offered by others, rather than insisting on being the leader."

When someone else shows the courage you wish you had displayed, it is tempting to attack him in order to conceal your own timidity. The second most difficult act for many would-be leaders is the act of not attempting to lead when someone else is doing a good job.

20. "I gave others a chance to succeed or fail for themselves."

The most difficult act for would-be leaders is not attempting to lead when others are *not* doing a good job.

21. "I set an example for others to follow."

This statement is a summary of everything a good leaders does.

This list was generated directly from ordinary people's experiences in a leaderless situation, but few professors can produce a more useful set of guidelines for would-be leaders.

The list is eloquent evidence that everyone has leadership potential. In each individual, some elements are better developed than others, but anyone can improve as a leader simply by building the strength of existing elements.

Of course, generating a list in this fashion is not likely to produce a complete inventory of leadership actions. After the GYO discussion is finished, I post the list with an open number at the end. I then invite the participants to add items to the list whenever they arise.

What Is the Value Of Technical Leadership?

When I first went into business for myself, I was afraid to quote prices. Until I could put a value on my services, any price sounded high — not just to me, but to my clients. The workshop, "Becoming a Technical Leader," sounded particularly expensive, because its price included a full week in residence with two instructors.

To make matters worse, it was a leadership workshop. Many of my clients had already taken leadership workshops — often at a much lower price. They wanted to know why technical leaders were different from ordinary leaders, why a special workshop for technical leaders would be worth the extra price.

I used to get offended by requests to provide economic justification for my work in monetary terms. I was cured when one client pointed out that since I defined leadership in terms of increases in group productivity, I ought to be able to define and measure technical leadership in the same way. I had to prepare some dollars-and-cents cases to demonstrate just what technical leadership means. Several examples follow:

Case 1. The Collapse. At first, I thought Joe might learn nothing from the workshop. He was extremely quiet and, in keeping with the tone of the financial institution that sent him, seemed straitlaced. I was particularly concerned about how he might react to some parts of the simulations.

One exercise teaches principles of

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design through building structures out of unusual materials. At the beginning of their construction project, Joe's team made a poor design decision. An hour later their entire structure collapsed — with Joe underneath it.

I did not see Joe until several years after the workshop, when he attended a different workshop I was holding near his home. He wanted to talk to me about the effect "Becoming a Technical Leader" had on him.

Shortly after the workshop, he was put in charge of a major development project — estimated to represent a $3 million investment in software alone. About six months into the project, Joe had a dream in which he was back at the technical leadership workshop, under the collapsing structure. He did not think about it, but the same dream recurred on several successive nights. One morning on his way to the weekly project meeting, Joe was thinking about the dream and suddenly realized that their $3 million project had been designed exactly like his team's ill-fated structure.

"Our early decisions were unsound," he explained, "though they seemed good at the time. But we'd not reexamined them in the light of recent changes. That was what made our structure ultimately collapse, and it would certainly have done the same thing to our project. Then it was a game, but now it was dead serious. And just like the last time, I would be under the structure when it fell."

At the project meeting, Joe called a halt to further work until the original design decisions had been reevaluated. As a result, the project took a new and ultimately successful turn. In Joe's estimate, the project could never have been successfully completed without the redesign.

Based on previous experience, Joe estimated that without the redesign, they probably would have doubled their original budget estimate before realizing that the project had to be axed. Considering the original estimate as the value of his improved technical leadership, Joe figured his company got a $3 million return on an investment of less than $2,000.

'Technical activities are those in which knowledge can have a catalytic effect. A tiny increase in the leadership ability of technical workers can have an enormous payoff.'

Whatever the source of the savings, this case clearly illustrates that technical activities are those in which knowledge can have a catalytic effect. Therefore, a tiny increase in the leadership ability of technical workers can have an enormous payoff on the bottom line.

Case 2. The Kludge. The second case involves three people who participated in "Becoming a Technical Leader" at different times. Their manager, who never attended the workshop himself, called me to report the results.

The firm sold hardware/software systems, but its latest offering was deadlocked by a technical problem. One part of the system required a special piece of hardware — a unit that would add about $50,000 to the cost of each system. Market surveys showed that the added cost would

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eliminate a profitable portion of their market. The design team was dismayed, but could not think of a viable alternative.

Two of the seven designers had already attended the workshop, but Jan returned from it in the middle of the dilemma over this problem, which they had labeled "the kludge." Seeing that the rest of the team was acting ineffectively, Jan suggested they try some new techniques.

First, they informed their manager that they must get away from the office, where frequent distractions were depleting their problem-solving resources. The manager was shocked by this request, but agreed to authorize three days in a nearby motel. To his surprise, they returned after a day and a half.

The manager explained, "I don't have any idea what they did at that motel. I'm not even sure I *want* to know. But when they got back, they had a detailed solution in a direction we had entirely overlooked. It not only relieved the problem, it entirely eliminated the $50,000 kludge."

Over 100 of these systems have been sold. One can only speculate whether that many would have sold at a far higher price, but the manager gave his group credit for saving "$5 million at the very least." For approximately a $6,000 investment, the result is effective, even without counting additional benefits.

Even if the cost of the motel room is counted, this is another example of the catalytic power of leadership in a technical environment. It also illustrates that technical leadership need not reside in just one member of a group and that good leadership spreads through modeling behavior. Only three of the seven members of the team had been through the workshop, but that was enough to convince the others to adopt some new problem-solving techniques.

Case 3. The Leak. One workshop exercise involved methods of "thinking the unthinkable." In the middle of the exercise, Gail emitted a protracted outburst. Thinking she might be injured, we stopped the exercise for an explanation. As it turned out, Gail had been thinking the unthinkable about the billing system she used at work, and the injury was merely psychological.

Gail explained that the billing involved tens of thousands of small bills, adding up to over $1 billion a year. The system was almost completely automated, though frequent changes were required to the billing algorithm. While thinking the unthinkable, Gail imagined a circumstance in which the billing algorithm did not work correctly. In fact, it did not work at all and certain services were not billed.

Gail returned to work and examined the system. The "unthinkable" case turned out to be rare — occurring about once in a thousand bills. But, as Gail said, "one-thousandth of a billion dollars is a million dollars."

The problem had been in the system for over two years, but there was was no way to recover the lost revenue. Nobody can say how long the flaw would have stayed in the system, but two more years seems to be a reasonable estimate. In that case, Gail saved the company $2 million — actually much more, though she could not reveal the company's confidential billing figures.

This case illustrates technical leadership in its purest form — the leadership of ideas. Once Gail had discovered the problem, she had no difficulty convincing anyone that it needed to be corrected immediately. The group interaction was simple, but it was worth $2 million. If Gail had not taken the initiative by thinking creatively, the error might have remained undetected forever.

A final point to consider is that leadership is not consumed when it is exercised — if anything, successful leadership breeds more successful leadership. So, the true leverage on an investment in technical leadership might be much higher.

About the Author

Gerald M. Weinberg is a consultant and trainer at Weinberg and Weinberg in Lincoln, Neb. He is author of The Psychology of Computer Programming *(Van Nostrand Reinhold, 1971) and 16 other books.*

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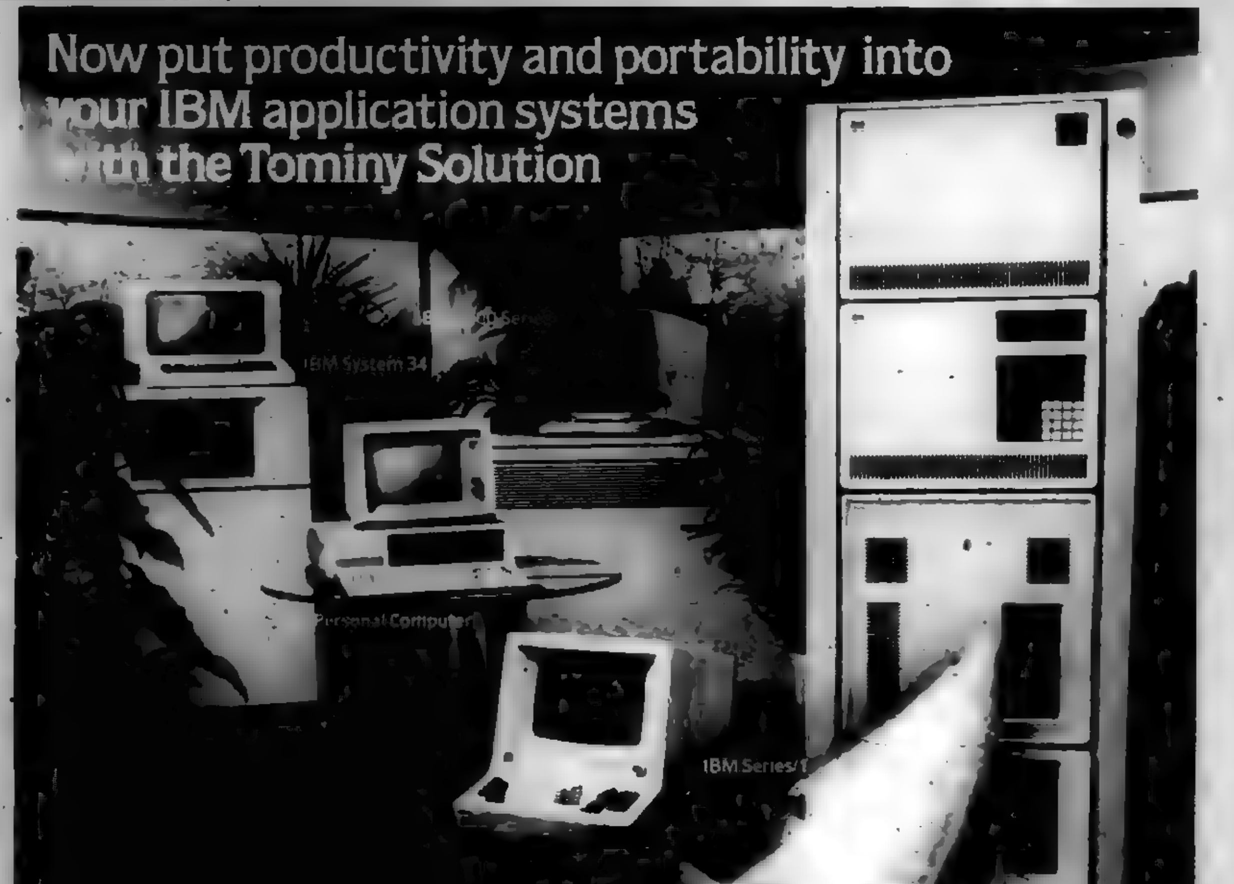

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Software Copyrights: Mapping New Territory

By Norman L. Wilson Jr.

When the farmers and sheep raisers moved West, invading the cattle ranges, range wars were inevitable. For years, ranchers had driven their cattle to grass and water with no attention to property lines and boundaries. By being there first, the cattle ranchers had established their rights — or so they felt. As grass and water became more scarce and more valuable, all over the West range wars were fought over fenced land. Boundaries and property lines assumed a new and momentous significance.

The range wars were very much a consequence of undefined boundaries. Today we have another set of undefined boundaries, and the stakes are just as high. The issue is not the extent of land to be fenced in, but the extent of copyright protection to be afforded a computer program owner. Just as the influx of settlers increased the value of grasslands and water, today the rapidly growing number of computers is enhancing the value of software.

The framers of the copyright laws did not envision the problems raised by advanced electronics. High technology has spawned copyright questions that cannot be decided by direct application of the laws. As a result, strong competing claims are being asserted, this time to source code rather than to sources of water.

When boundaries are not definable by the literal terms of the Copyright Act, they must be fixed by applying more general principles of copyright law. Through the years, a certain moral right to the integrity and reputation of artists has become imbued in copyright law. This right is not mentioned in the Copyright Act, but such moral aspects of the law come from British common law. Accordingly, when existing law is unable to give the courts clear guidance, these aspects of the law are significant. Suits become more equitable.

Decisions are drawn by balancing accepted principles of law against the creator's right to a monetary return. In establishing boundaries in competing copyright claims involving computer programs, courts in some cases are faced with the task of determining new factors for use in interpreting copyright law. This, of course, shifts the boundaries of established copyright law. A look at some of these modern frontier disputes will show how the boundaries have shifted.

The Copying Boundary

A song entitled "No Man Is an Island" was written in 1950. The title is the first line of the lyrics, and the second line is, "No man stands alone." In 1953, a music teacher and a school teacher composed a song with different music and lyrics, but the two opening lines and the titles were identical. Consequently, the parties competed in court, even though only two lines were claimed to have been appropriated. In the course of the trial, the court reaffirmed a well-known tenet of copyright law: A "plaintiff must establish that actual copying occurred in order to make out a case of copyright infringement."

The court acknowledged that it is virtually impossible to prove direct copying. Evidence must be circumstantial. Accordingly, the plaintiffs argued that the two teachers must have heard the plaintiff's song on a radio or television broadcast before writing their own. Fred Waring used the song as part of his repertoire. Nevertheless, the court dismissed the complaint, proclaiming that the plaintiffs failed to prove copying.

Since it is practically impossible to provide a witness to prove copying, the courts have long held that it is sufficient to establish access by the alleged infringer. The "No Man Is an Island" suit showed that access may not be inferred. In fact, a manuscript physically in the same city was deemed insufficient evidence of access. Possession must be shown. It is apparent, then, that the courts have clearly mapped out copying boundaries. If copying cannot be shown, access must be proven.

Now consider a computer suit, Midway Manufacturing Co. vs. Dirkschneider (July 1981). A designer and manufacturer of coin-operated video games obtained copyright registrations on its Galaxian, Pac-Man and Rally-X games. It asserted that the defendant's actions constituted an infringement of these established rights. Among the elements of this infringement action was the question of copying. The games can be copied by electronically copying programmable read-only memory, which stores the information that produces the images and sounds of the game.

But what about access? The court acknowledged the difficulty of producing direct evidence of copying and stated that it is necessary to prove access to the copyrighted work. "In the instant case," the court surprisingly announced, "the similarities between the works are so striking that copying may be inferred without direct proof of access."

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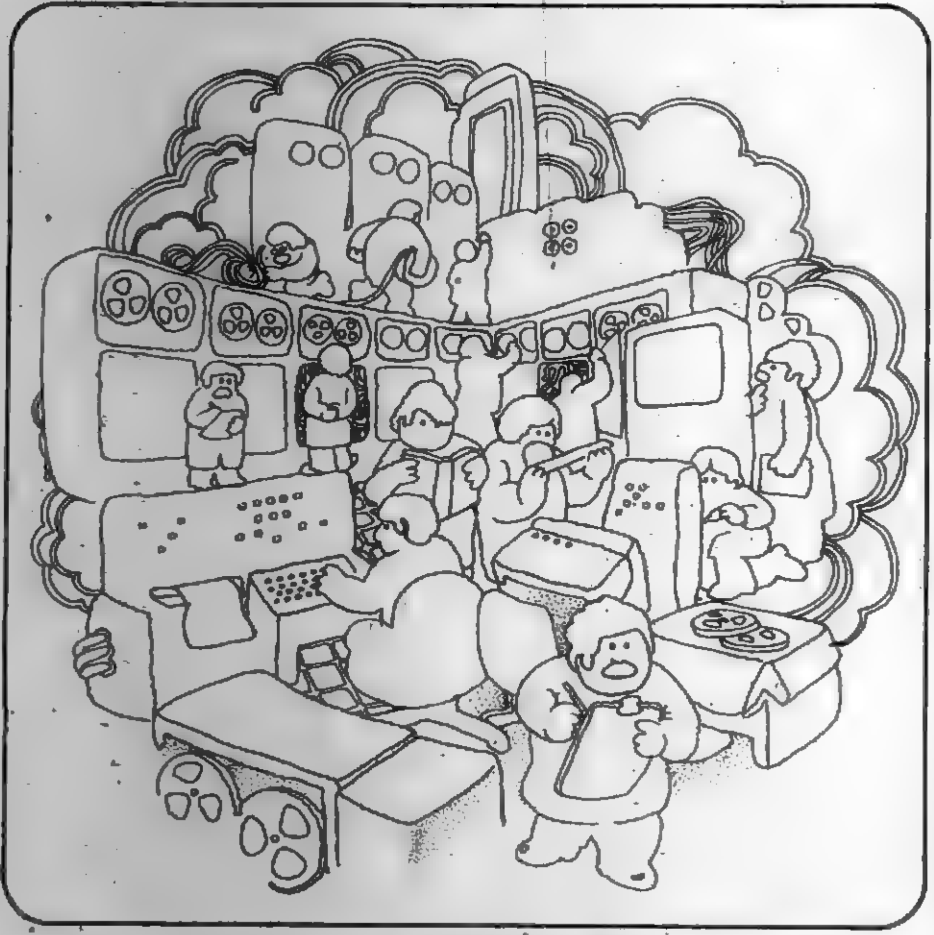

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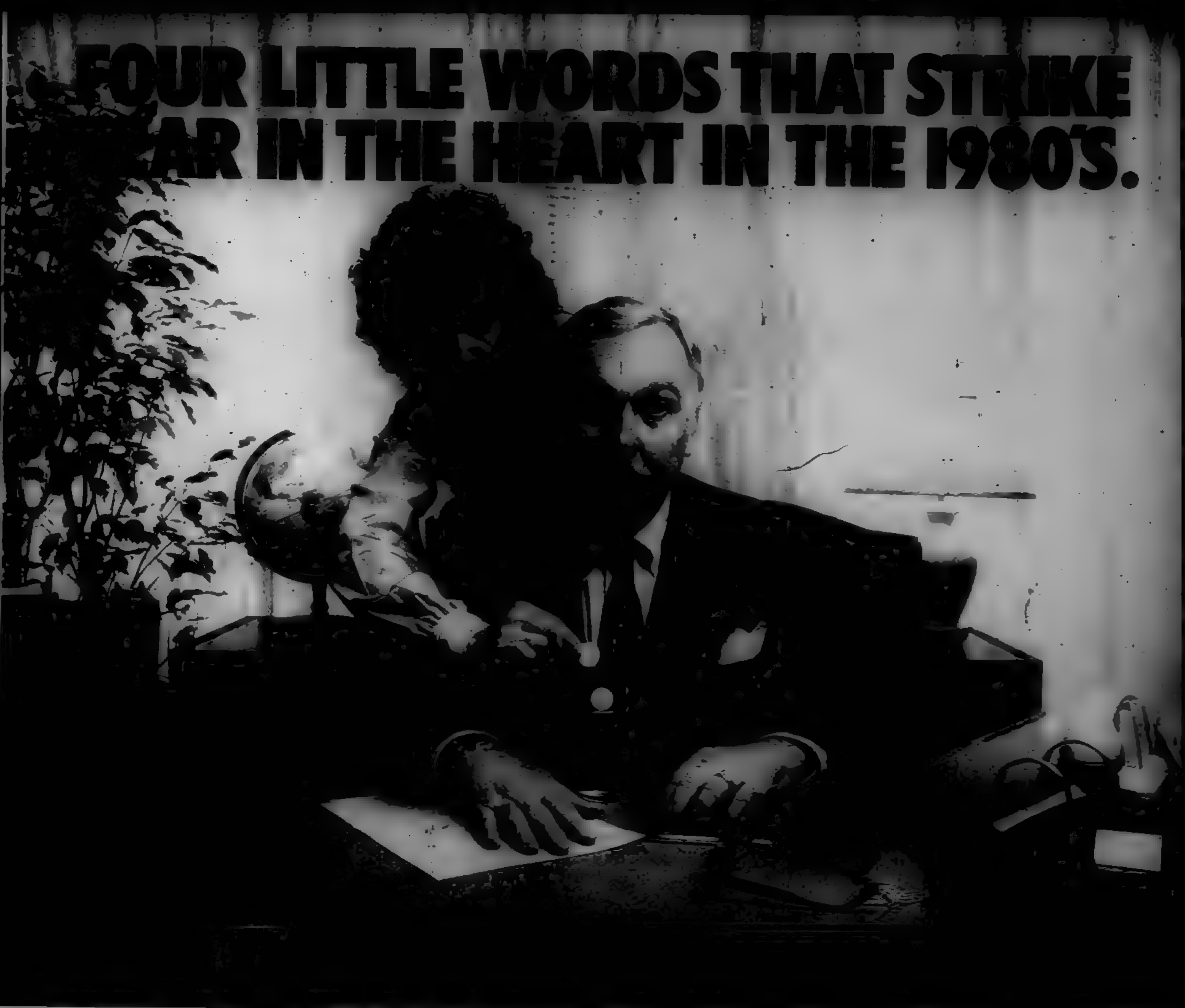

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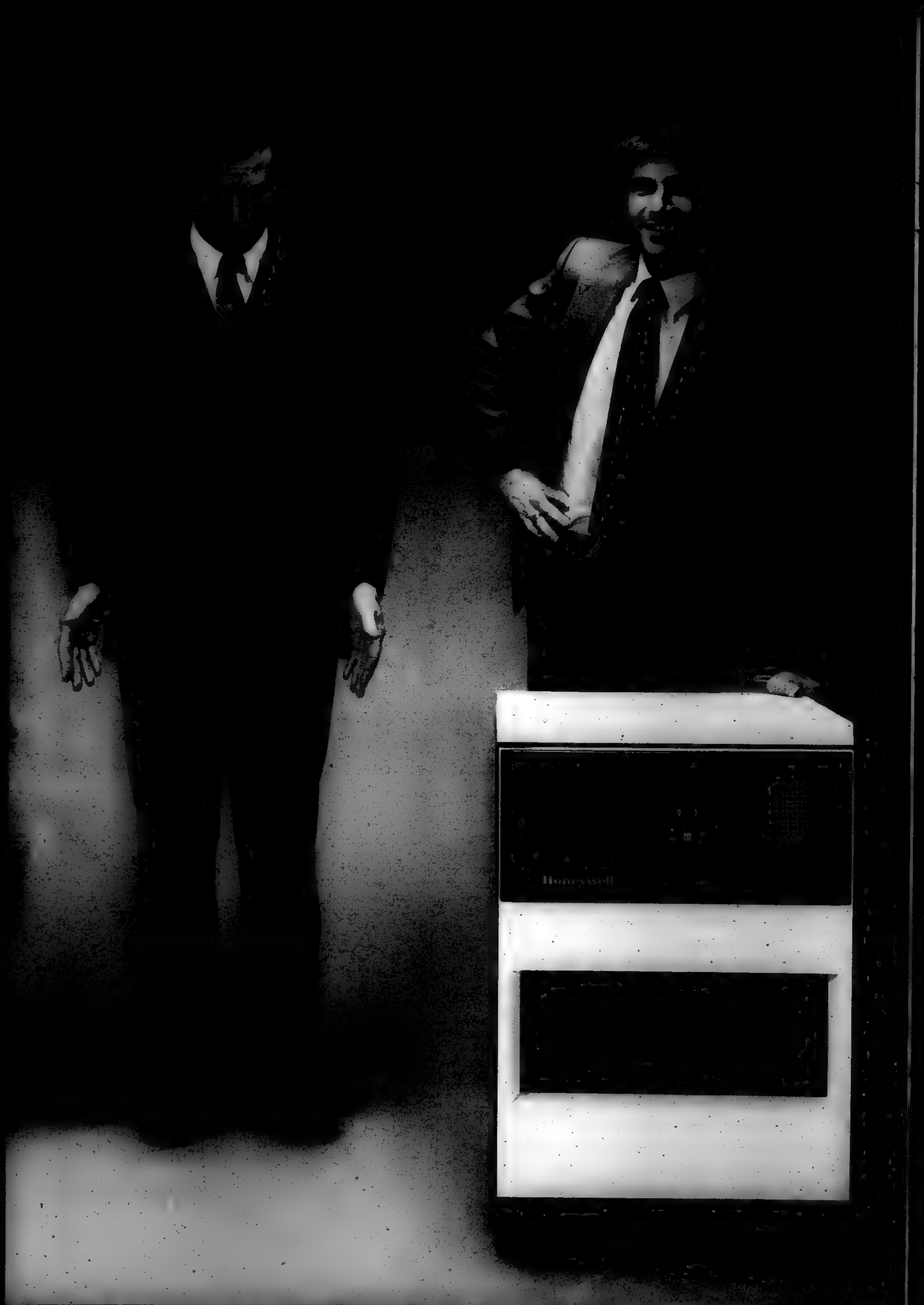
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as favoritism. In setting new boundaries by equitable principles, courts fall into a similar trap. Whether or not computer programs are a favorite of the law, it can be seen that in balancing the equities, the copyright boundary has been extended.

The Chip Boundary

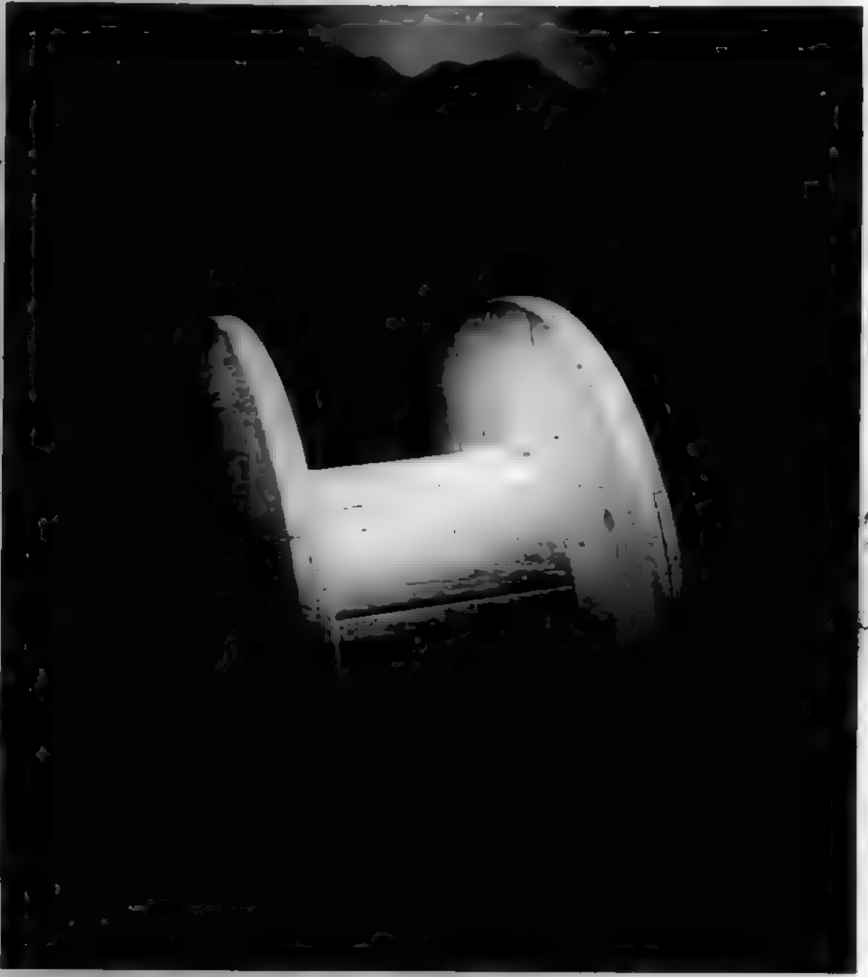
The U.S. Supreme Court considered copyright boundaries in 1907, in an action brought to alleviate the infringement of two copyrighted songs, "Kentucky Babe" and "Little Cotton Dolly" (White-Smith Music Publishing Co. vs. Apollo Co.). The accused infringer, however, was not a song publisher, but a company selling player pianos and the perforated music rolls for them.

The rolls served a function somewhat similar to the chip in a computer. The rolls, when used in connection with the instruments, reproduced the melodies copyrighted by the music company. The music company argued that music is intended for the ear and the copyright laws cover all means of expressing these notes. The piano company, on the other hand, contended that while the copyright laws are intended to reward mental creations, the extent of such protection is a matter of statutory law. And the law extends only to copying tangible results of the mental conception — the sheet music. The court set forth the issues: Is the perforated piano roll a copy of the sheet music? Is it a copy at all?

The Supreme Court had to balance decisions holding that the physical form of a composition does not limit the copyright, against those stating that since copyright exists by statute, the limitations are imposed by the statute. The court maintained that Congress repeatedly had occasion to amend the copyright law and did not. It concluded that the rolls were not copies of the sheet music within the meaning of the copyright law. On the contrary, the rolls were parts of a machine that produced musical tones.

The question today is: Can computer chips be considered copies of copyrighted computer programs? In light of the piano roll decision, they cannot be. Chips are parts of a machine that, when operated, executes a program. The boundary is set. The copying must be the tangible embodiment of the intellectual product, the source code. A chip is a part of the computer.

Not so. In August 1981, in the U.S. District Court in California, this reasoning was used to argue that the chip was outside the boundary of copyright protection (Tandy Corp. vs. Personal Micro Computer). The defendants, on moving to dismiss the case, argued that read-only memory chips cannot be considered copies of a copyrighted program. "Therefore," the defendants declared, "there is no copyright infringement." The court, however, proclaimed that a silicon chip is a tangible medium of expression within the meaning of copyright law. "Copyrights can



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be infringed," the court pronounced, "by duplicating a computer program imprinted on a silicon chip." The court extended the "copy" property line.

The Object Code Boundary

Object code is output from a compiler or assembler in the form of machine code or in a form suitable for processing into machine code. The computer cannot run without it. Human understanding, however, is an element of copyrightability. Generally, at least a portion of the work should be visually perceptible without the aid of a machine. Since object code is machine-produced, who is the author of the coding?

Have the courts followed these principles in fixing the object code boundary? Should such coding be inside or outside the boundary of copyright protection? In 1947, it would have been outside the boundary and available for use by the competitor. In that year, a court ruled that if a machine was useless without written materials, these materials were, in effect, parts of the machine and not literature that could be copyrighted (Brown Instrument Co. vs. Warner). Those materials did not convey the thoughts of the author and, thus, were not eligible for copyright. The copyright laws, so the reasoning was at that time, were intended to protect the art or art form in writings. This intent would be frustrated if copyright law also encompassed mere information.

When the recent cases involving object code first arose, the courts set the boundary as would be expected in view of the 1947 decision. While acknowledging that the new definition of "copy" encompasses works that may be perceived with the aid of a machine or device, the courts declared that the Copyright Act of 1976 applies to computer programs only in their flowchart, source and assembly phases, but not in their object phase. In its object phase, the reasoning went, a computer program is a mechanical device lodged in a computer to become an essential part of the mechanical process.

As computer programs became more prevalent and more valuable, the boundary began to shift. After all, copyright areas of computer uses were not considered sufficiently developed for an ultimate solution. In August 1982, the U.S. Court of Appeals for the Third Circuit (in Pennsylvania) concluded that a computer program expressed in object code is copyrightable subject matter. "To hold otherwise would create an unlimited loophole by which infringement of a computer program would be limited to copying a program text," the court said in its decision (Williams Electronics, Inc. vs. Artic International, Inc.).

Since object code is merely a compiled source code, the creativity still exists. The copyright boundary was altered again.

The copyright boundary did not end with the ability to copyright unperceivable object code. A manufacturer of machines for processing silicon wafers for integrated circuits obtained copyrights on his source code and sued several of his former employees, using object code, for copyright infringement. The ex-employees declared that copyrights on unpublished source code do not protect uncopyrighted object code. In its July 1982 decision in GCA Corp. vs. Chance, the court reasoned that "because object code is the decryption of source code, the two are to be treated as one work; therefore, copyright of the source code protects the object code as well."

By coming up with a decipher theory, the court further extended the object code boundary.

The Fixation Boundary

It has been generally acknowledged that, for a work to be a writing, it must be in a tangible form. Copyright laws, so it is alleged, concern a physical rendering of the intellectual or aesthetic creation. In order to determine copyright infringement, some permanent material must exist. The material must be fixed. With television in view, the Copyright Act of 1976 states that "a work consisting of sounds, images or both that are being transmitted is 'fixed.' " The act allows a work to be fixed if it is perceived for longer than

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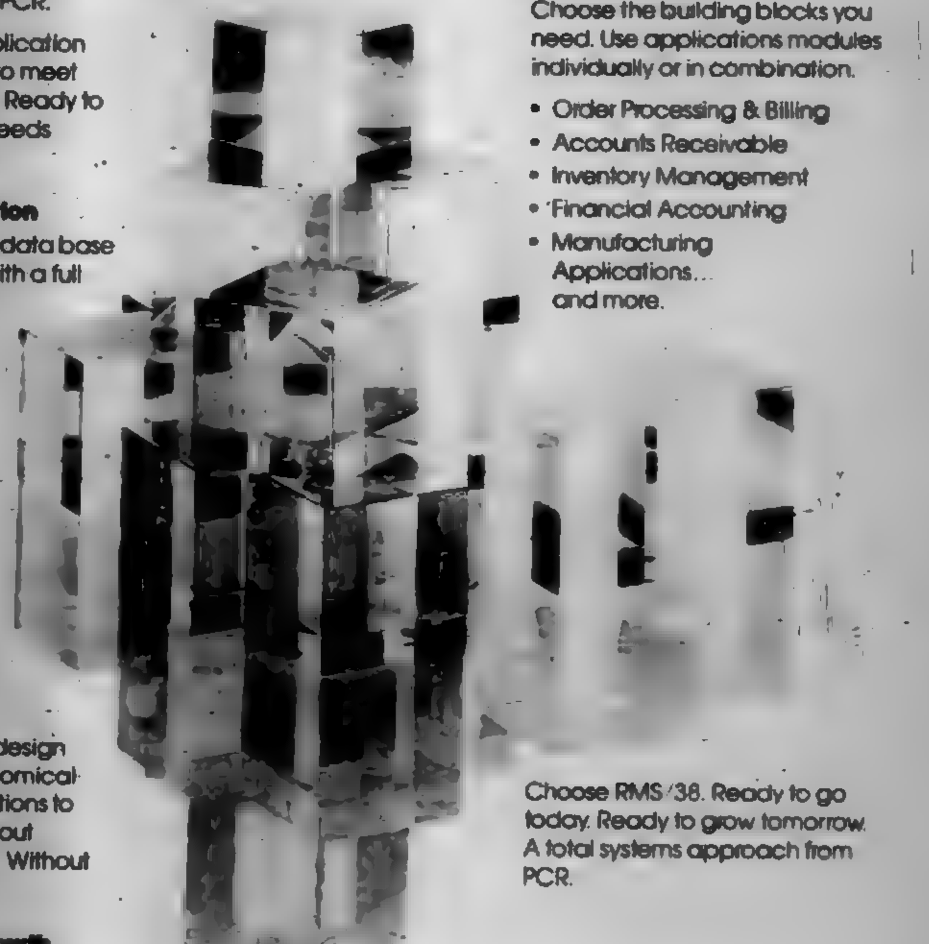

a transitory period. The House of Representatives report (No. 94-1746) accompanying the act does not, however, appear to extend this TV concept to computer games. The report emphasizes that the definition of fixation excludes purely evanescent or transient reproductions such as those projected briefly on a screen, shown electronically on a television or other CRT or captured momentarily in the memory of a computer.

It seems that the fixation boundary has been clearly established by the House report. It can be argued that the boundary excludes the Pac-Man and Galaxian "ephemeral" projections on a CRT. In Midway vs. Artic International, Inc. (June 1981), the defendant contended that Galaxian cannot be fixed because movements of the images on the screen are responsive to the movement of the player. The plaintiff, on the other hand, asserted that the playing mode consists of a fixed sequence of images that play in a loop of approximately one minute's duration.

This argument appears inconsistent with the House report. However, a district court in Nebraska declared that the audiovisual displays were entitled to protection — even when computer programs upon which they are based were not copyrighted.

The videotapes submitted for the copyright registrations showed the works to be audiovisual, intended to be shown by machines or devices such as projectors, viewers or electronic equipment. The fixation boundary appears not to have been set with the intent of the legislature in mind, but with a basic moral view of copyright law (Midway vs. Dirkschneider).

The copyright law is designed to reward creative and artistic endeavors. Another seeking to reap the benefits of this effort is harvesting his neighbor's crop.

The Idea-Expression Boundary

The boundary of copyright protection does not extend to abstract ideas, but only to the expression of the idea. The ideas themselves must be available to everyone. It is only when an imitator goes beyond the idea and borrows its expression that he is an infringer.

"Romeo and Juliet" is a classic example that it is not the idea, but its form or expression, that can be copyrighted. Many plays with the "Romeo and Juliet" theme have appeared.

To view the law in any other way was believed to constitute a withdrawal of ideas from the public domain. Copyright protection is granted to persuade authors to make their ideas freely accessible. The idea, then, should be outside the boundary of protection. This is the boundary line the Supreme Court has been asked to examine in the case of Atari, Inc. vs. North American Phillips.

To exemplify this "substantial similarity" issue, the appellate court in the Atari case considered a prior case involving a copyrighted bee-shaped jeweled pin (Herbert Rosenthal vs. Kalpakain, 1971). Obviously, many bee-shaped pins can be made. But the copyright owner disavowed a claim to these other pins, seeking to protect only his particular design.

With this case in mind, the court in the Atari case began its comparison. "K.C. Munchkin," it said, "not only adopted the same characters, but also portrayed them in a manner which made K.C. Munchkin appear substantially similar to Pac-Man."

The court concluded that this was not a case in which only the idea of the game was adopted. The court seemed to feel that the game's unique form of expression was also used. The defendant appears to believe that the boundary has been extended beyond expression so the idea is not available. The Supreme Court may well set this boundary.

In the final analysis, it appears that the copyright wars ultimately will be settled on the basis of uniqueness and creativity. The amount of protection will depend on the degree of originality in contrast to images and imitations.

About the Author

Norman L. Wilson Jr. is a patent attorney in St. Louis. He works on government software agreements and computer patents.

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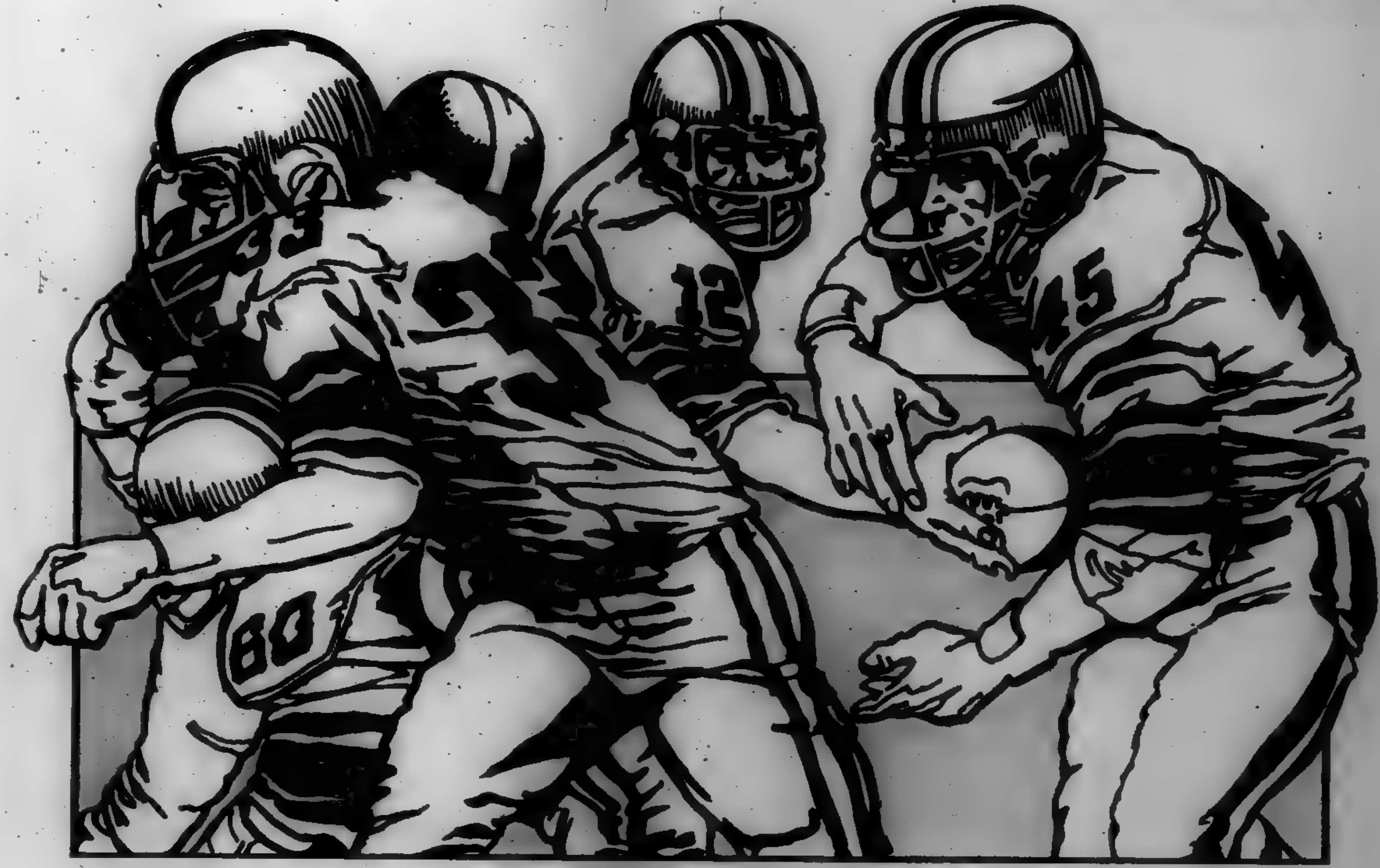

Team Planning

How to set up a collaborative environment that brings big rewards in management productivity.

By Donald Gertsman

For decades, managers and scholars have been seeking ways to improve productivity by altering behavior or improving efficiency. The only certainty at this point is that there is no single right way to address this issue.

Productivity is typically defined as the ratio of work performed during a specific period. It is normally measured in such terms as pieces produced, sales calls made or lines of code written per hour, day or month. Productivity standards typically measure the activity of "doers" rather than managers. Managers rarely consider their own productivity; instead, they concentrate on extracting output from others. As a result, they seldom have time to do all the things they need to do and often end up doing the wrong things.

Since normal productivity measurements do not apply to managers, the key to management productivity is to determine the most important managerial tasks and then to determine the most effective, efficient way to perform them. This is planning in its most basic form.

Planning is one key to management productivity; thus, finding effective ways to plan should be a high priority. Unfortunately, few organizations focus on the actual process of planning. This article presents a team planning

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methodology that, if properly implemented, can have a significant effect on both productivity and achievement.

Definitions

The terminology used in the planning process often leads to confusion, because the terms are not used consistently or defined in sufficient detail to ensure clarity. The definitions here are often found in other literature on planning. Each management team must agree to a set of terms and must use them consistently. The definitions that follow are used in this discussion:

Planning. The first of the five classical functions of management (the others are organizing, staffing, directing and controlling), planning is designing a desired future and developing effective ways to bring it about.

Goals and objectives. These are the most confusing of all planning terms, because about half of the people use goals as the broader of the two terms, while the others use objectives. This article defines these terms as follows:

- Goals are general, long-term and relatively stable. Their attainment is often beyond the time frame of a plan. Changes in goals are usually an indication of a major change in the direction or the value system of an organization.
- Objectives are specific, short-range and change frequently. They are measurable, time-oriented and attainable within the scope of a plan.

Strategy. A strategy is a broad course of action that translates goals into objectives. For example, if a goal is an increased data processing user base, a strategy might be to implement new inquiry systems. Specific objectives might include application selection, establishment of a new organizational structure to staff the new applications and so on.

Tasks. These are activities that support the achievements of objectives. In order to establish new applications in the previous example, tasks would include identifying alternative needs, performing cost-justification studies on each area, identifying other factors that might affect the selection and selecting the specific application area to be recommended to management.

Action programs. Objectives and tasks often combine to form the basis of action programs.

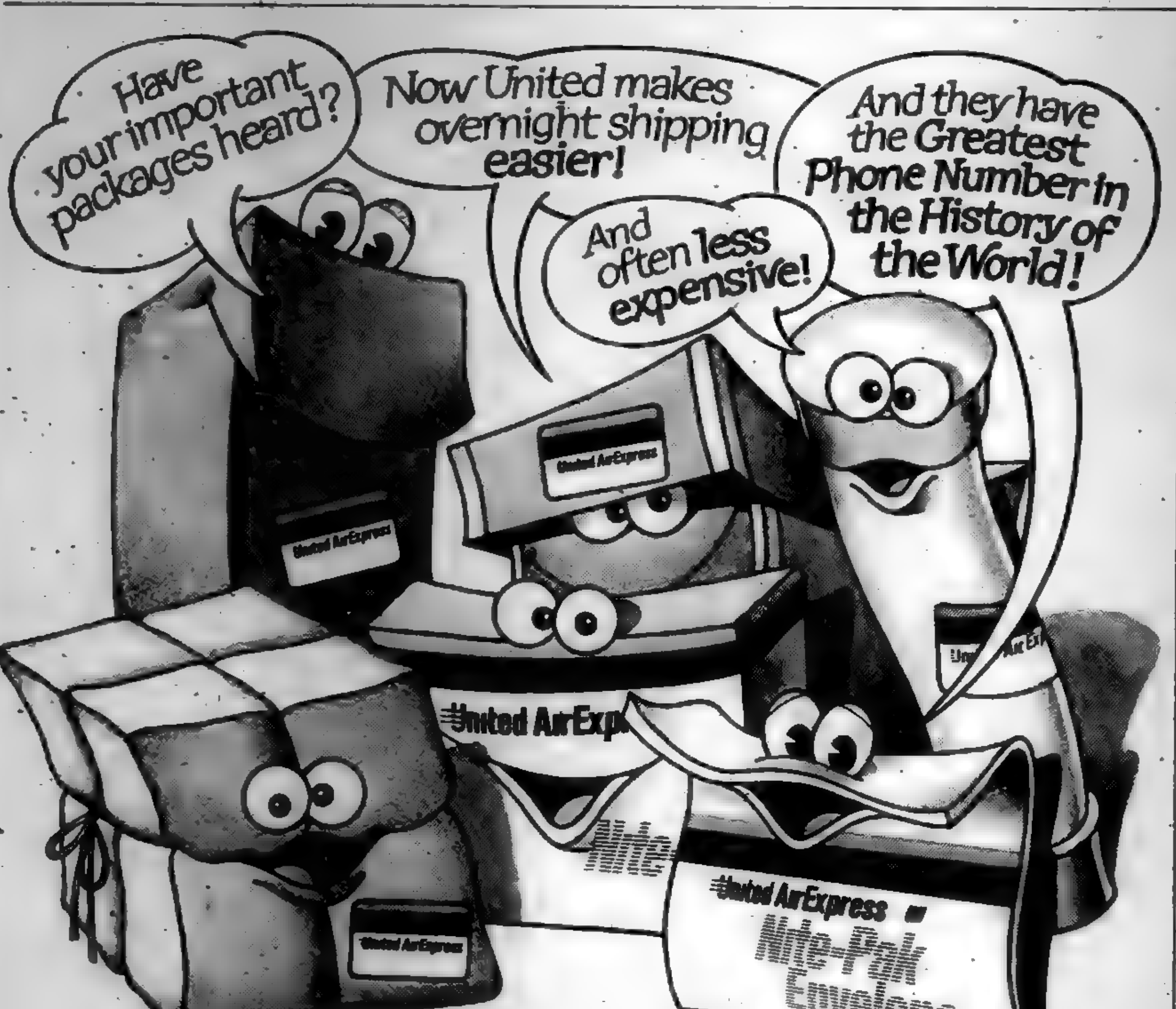
Team Planning

If planning is the design of a "desired future" and of effective ways to attain it, then it is helpful to understand the ways in which people try to create such a design. In DP organizations, planning is usually carried out by the senior DP executive, a planning officer, an outside consultant or a team responsible for executing the plan.

Senior DP executive. The DP executive describes, often in fulsome detail, what other people in the organization must do to ensure success. This method was very popular years ago when managers tended to be more authoritarian, and it is still seen today when the DP manager has an autocratic style. The DP manager may have a general perception of where he wants the organization to go; however, he does little to ensure that the plan has the support and commitment of the people who must execute it. In many cases, the DP manager ends up saying, "If my people were good enough to execute the plan, we would really be in good shape."

Planning officer. Use of the planning officer approach has increased during the past few decades. Recognizing that he does not have the time, skill or inclination to develop a plan, the DP executive transfers planning responsibility to a staff assistant or subordinate manager. This person is responsible for defining the objectives of the DP organization and for outlining the role of each functional area. This information is then integrated into a plan.

Unfortunately, the result of this process is too often a plan with very little input or commitment from the rest of the DP organization. Obviously, the planning officer cannot execute the plan alone. Once again, the people who must execute the plan either do not understand it or are not committed to it. A staff planning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function can be an important part of an organization, but it serves better as a catalyst and coordinator, rather than as the creator of the plan.

Outside consultants. While the outside consultant method may result in a beautifully bound volume entitled, "Long-Range DP Plan," the volume usually remains on a shelf collecting dust.

An outsider can bring valuable objectivity to the planning process. This method, however, suffers from the same problem as the preceding ones: There is little internal commitment from those who must implement the plan. More importantly, when the plan prepared by the consultant becomes outdated, as any plan will, the skills necessary to modify and update it will usually not be available internally. A consultant can serve a very useful function in assisting in developing the plan or in reviewing the plan itself, but it is much better to involve all the members of DP management in the planning process.

Planning team. During team planning, the people responsible for implementing the plan also create it. This approach acknowledges that planning is a fundamental responsibility of each manager and that a management team must work together to ensure that the plan serves the organization's needs. In an environment of effective collaboration, individuals tend to use the organization's resources in the best interests of the organization, rather than in creating provincial plans serving only a small segment of the organization.

Team planning, like any other planning method, is best accomplished through a coordinated effort. Plan integration and execution are far easier when all groups create their plans in a consistent fashion and at approximately the same time.

Basic Approaches

There are two basic approaches to team planning. While there is no strict division between these two approaches, it is possible to classify them as behavioral and issue-oriented.

Behavioral programs. The behavioral approach focuses on how individuals act within the organizational structure, and it often attempts to assist them in becoming more effective not only as managers, but also as individuals. These programs are sometimes referred to as sensitivity training and are often conducted by industrial psychologists. After discovering why individuals or organizations have not been functioning as effectively as desired, these programs identify the steps necessary to improve the working relationships.

This type of training is extremely effective in some cases, but it is not without risks. Some individuals may feel uncomfortable and may resent participating in a behavioral program. In addition, such programs focus on changing behavior, rather than on gaining a clear understanding of the issues confronting the organization. While individuals can gain much from participating in sensitivity programs, it is probably better that they do so as individuals rather than as part of a management team.

Candor is a vital part of a behavioral program, and the problems that can arise when an individual decides to unburden his soul are often too great for an organization to handle. If a behavioral program is needed, it should be kept separate from business planning issues.

Issue-oriented programs. Emphasizing issues can bring about some useful behavioral results. People who seem to have antipathy for one another sometimes find that it is not their personalities that have been causing the problem, but the roles they have been playing. Creating an environment that fosters teamwork often dissipates this kind of friction and allows all individuals to focus their energy on the same goals.

Planning issues in most organizations are so complex that the energy of all individuals involved is needed to clarify them. Concentration on clarifying these issues can result in two benefits. First, individuals who are apprehensive at the beginning of the program realize that they can be far more comfortable and make a far greater contribution, because they

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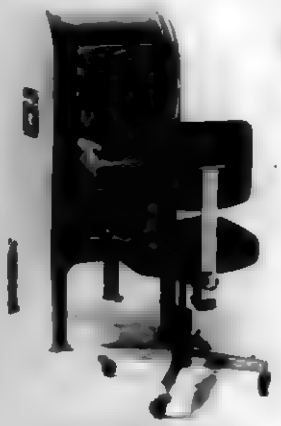

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are not worried about protecting themselves. Second, the focus is not on trying to find out why something did not happen and who was responsible for the failure: It is on acknowledging that something new must take place in the future.

While meetings associated with the team planning process are issue-oriented, the need remains for sensitivity to individual reactions or to behavioral problems among some members of the group. It is the job of a session facilitator to be sensitive to such intangibles. The facilitator must, however, steer clear of anything that smacks of sensitivity training to avoid the risks discussed previously.

Team Planning Environment

Planning is difficult work, and when a new methodology is used, it is extremely important to establish the proper physical environment. Leaving the work place for a few days is usually the best way to begin the planning process. The location chosen for planning should be:

- A nonthreatening environment.
- Far enough from the normal work environment that the participants are not tempted to go back to daily activities.
- Pleasant enough that the physical surroundings will not inhibit the planning process.

A conference center or an off-season resort is an ideal setting for beginning the planning process.

Participants must clear their schedules of all normal duties. All but emergency telephone calls should be discouraged. This prevents distraction and allows the team members to focus on the planning process.

Some DP executives balk at the idea of taking the management team off-site for several days, since they think that operations will suffer because no one will be left to run the shop. Experience shows that the opposite often occurs. When managers return from several days off-site, they often hear that things never went so well as when they were gone.

It is not a good idea to hold a planning session on a weekend. Having worked five days before the session, the team will face five more working days following its conclusion. Planning involves creative and analytical thought, which is hard for overworked or resentful people.

The room selected for planning should encourage easy conversation. A living-room setting with soft chairs and no conference table works quite well. A preferable environment is a first-floor room that looks out onto green and pleasant surroundings, but not onto something distracting, such as a swimming pool.

Casual clothing should be worn and time should be allowed for recreation, usually in the late afternoon. Most sessions include evening meetings, since they help maintain continuity and encourage the participants to accomplish as much as they can in the short time available.

Selecting Participants

The most important consideration in choosing members for a team planning session is to ensure that they are, in fact, part of the team. If three division managers are asked to participate with their boss in developing a groupwide plan, the managers must be able to see beyond their provincial interests and view the development of the plan from their boss' perspective. If the managers attend the session only to further their own interests, four separate business units will be represented. This is not conducive to team planning.

This does not mean that the inclusion of representatives from several departments is undesirable. For example, if a DP organization conducts a management review, then management from operations, systems development, systems programming and the other DP departments should participate. Their actions should be guided, however, by what is best for the entire organization. If one group meets its objectives at the expense of other groups, then the team planning process — and everyone involved in it — has failed. The session must be based on common interests and must result in a unified plan. This principle of cooperation

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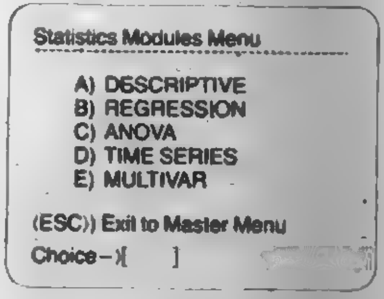

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    A) DESCRIPTIVE
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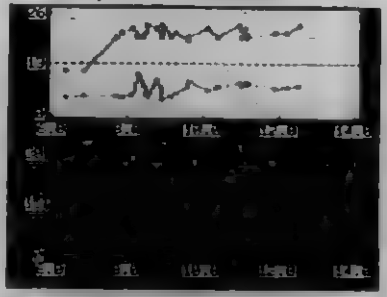

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> *'During meetings of the planning team, think in binary terms — up/down, on/off, yes/no, black/white — not gray. Gray problems yield gray objectives, which lead to gray action plans. Unfortunately, these are seldom executed.'*

must also be observed in project-oriented sessions.

The participants in a planning session should normally include those who will execute the plan. This helps avoid the "not invented here" syndrome. The optimum size for a planning team is six to 12 people. If there are too few, the interaction may be insufficient to generate the plan; if too many, some members may not be able to contribute.

An effective planning session must follow a set of ground rules. While each team must establish rules appropriate to its environment, the following have been successful:

- Consider all team members as equals. This means that no one is anyone's boss during the sessions. In addition, the senior members of the team must participate considerably less than they normally would, since people normally defer to them.
- Eliminate time limits and pressures. Do not, for example, schedule one hour for a specific topic. Issues can often be disposed of more quickly than expected, while others may take more time. Allow each issue to run its course in as much or as little time as required. This avoids both wasting time or closing discussions before issues are thoroughly resolved.
- Avoid artificial constraints. Think expansively, beyond yesterday's conditions. Often the mere presumption of a constraint can block creative thinking.
- Think in binary terms — up/down, on/off, yes/no, black/white — not gray. Gray problems yield gray objectives, which lead to gray action plans. Unfortunately, these are seldom executed. The team must focus on what is or what is not: A plan cannot be built on "maybes."
- Do not avoid issues. The purpose of a planning session is for participants to face issues and decide on a course of action. Participants tend to duck the issues if they feel a scapegoat is being sought, so it is important not to waste time trying to determine who is responsible for current problems. The important thing is everyone's dedication to making things go right in the future.
- Record the results of discussions in complete, simple sentences using action verbs. The ideas that result from each session must be easily understood during the session and clearly remembered later.
- Obtain unanimous agreement on each point in the plan. This is not an easy rule to follow. Since team planning is meant to build internal commitment, however, the rule is necessary. This is a key area of concern to the facilitator.

Some teams adopt other rules. For example, it is often helpful to allow only one person to speak at a time or to insist that a person who leaves the session cannot return (this avoids long explanations of why conclusions have been reached). While adherence to the rules is important, the team must use discretion in deciding how stringently to enforce them.

Sample Agendas

Most planning sessions fall into one of two categories: management review sessions and project-oriented sessions. During the management review session, the DP organization attempts to identify the issues critical to its success. The number of issues discussed may be small or large: There are no constraints in defining the issues. A project-oriented session, on the other hand, is confined to one issue — for example, developing a long-range information systems plan, hardware plan, network plan or staffing plan. The key to the suc-

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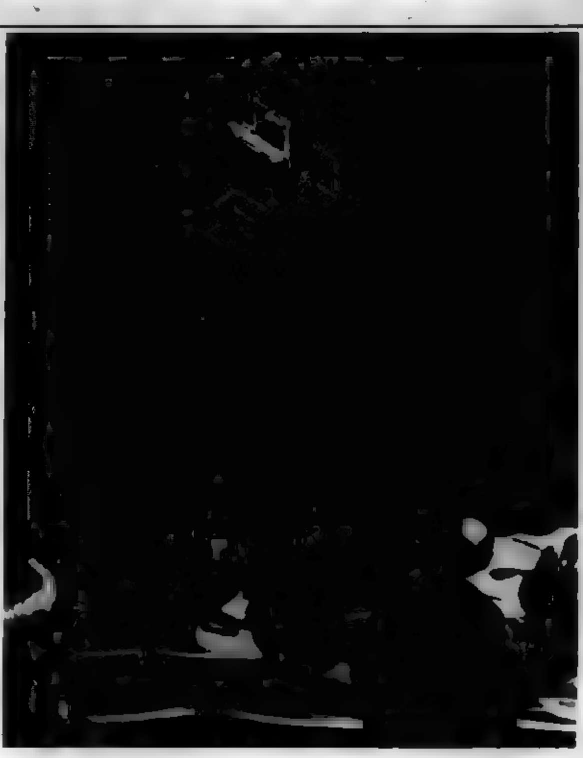

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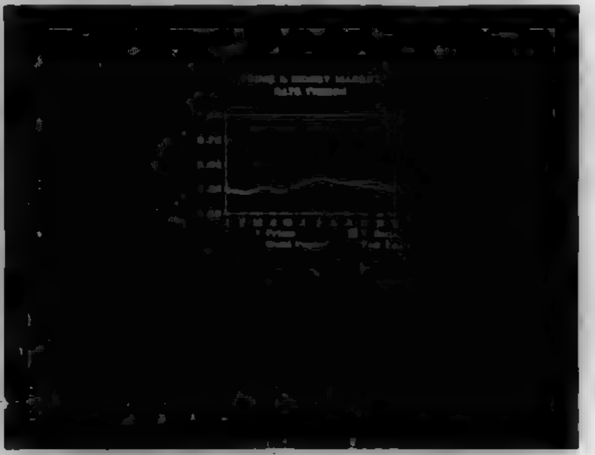

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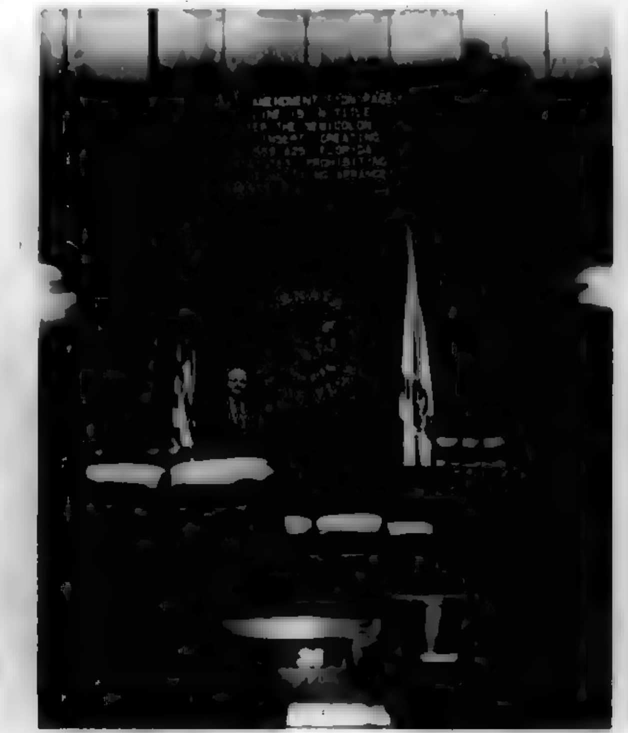

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cess of a project-oriented session is defining parameters before the session begins. A management review requires a different agenda.

Some managers sense a need for both types of sessions and they are often correct. If so, the question is which type should be first, because it is difficult to conduct both at the same time. There is no hard-and-fast rule regarding which session to hold first, but the following suggestions can help the management team make this decision. If the team is faced with numerous problems or has not been effective in achieving past objectives, major problems in the management system may need to be addressed. It is foolhardy for the team to try to establish a new project before alleviating such problems; therefore, the management review process should be conducted first.

For example, a management team was already working on a set of objectives when it participated in a management review planning session. The team validated most of the existing objectives, but it also developed four new high-priority objectives. Careful examination revealed that these four objectives were actually blocking the progress of the other eleven. Thus, it is often valuable to make a management review session the first step in the planning process.

On the other hand, a team faced with a pressing high-priority need may decide to hold a project-oriented session first. Although the broad management issues cannot be avoided forever, this strategy acknowledges the reality of today's problems.

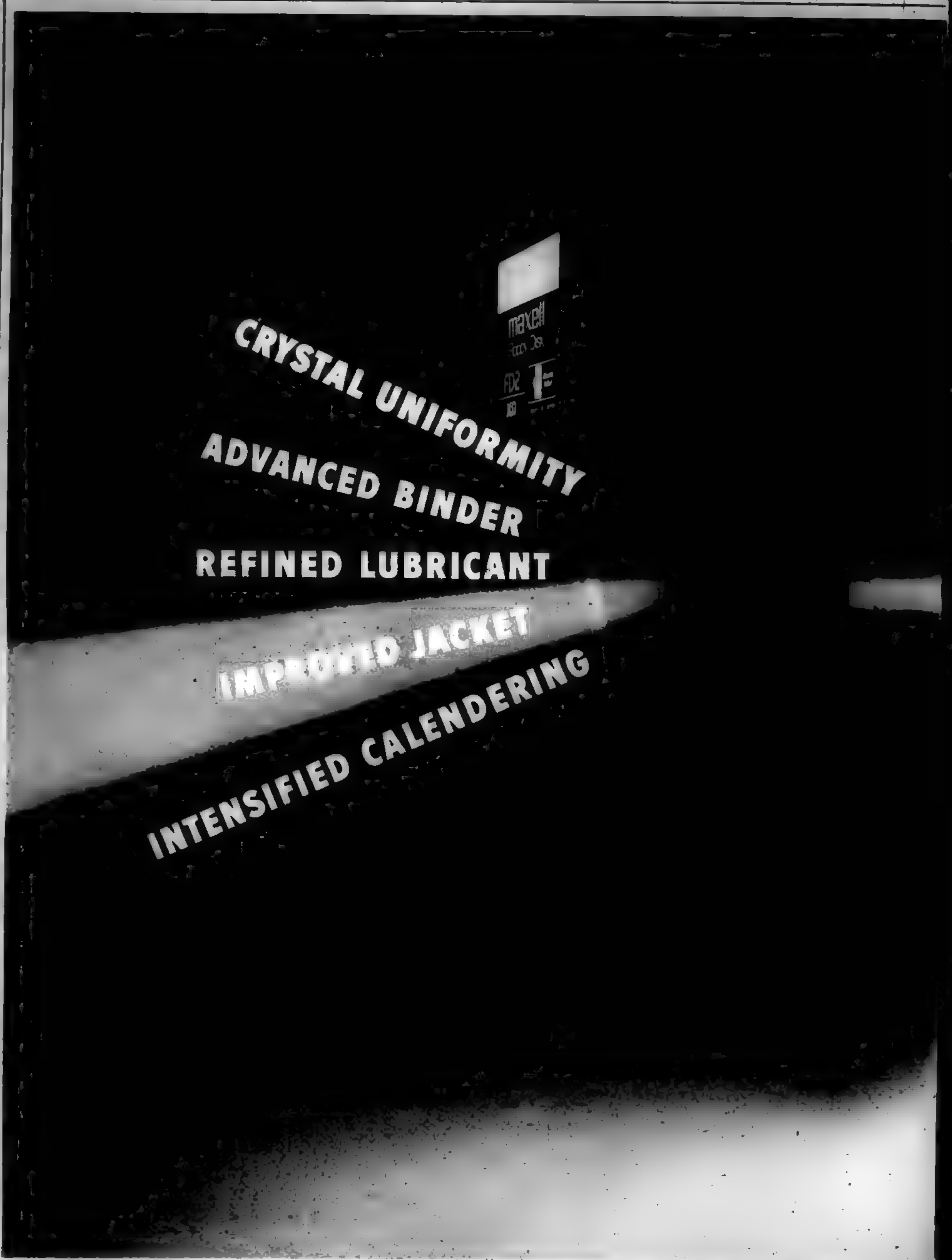
In any case, each type of session requires significant time and attention and both types should never be crowded into one agenda or planning session. The most likely result of such crowding is that neither planning effort will be successful.

Management Review

The objective of a management review session is to identify the issues the team must address. The issues might include removing existing problems or capitalizing on future opportunities. This type of session usually includes the senior DP executive and all individuals reporting directly to him. Other individuals may be included. Care must be taken not to slight someone by leaving him out. The basic agenda for a management review includes:

Introduction. The introduction establishes the agenda and the planning rules. Individuals can ask questions about the direction of the session and a positive tone should be established. If a facilitator is used, this introduction enables him to develop a rapport and to establish his credentials.

Present structures. The senior DP executive should not comment during the discussion of the organization's present structure, because this is his chance to see how the staff feels about the organizational structure. During this discussion, the facilitator might ask such questions as: Is this how it really works? Why was this structure se-



lected rather than some other one? Is the structure consistent with the organization's strategy? These questions help clarify the present status of the organization and they also prompt discussion and establish an open atmosphere.

Problem definition. The third item on the agenda is defining the problems the organization faces. An experienced facilitator can be extremely effective in this area. After each individual has raised any issue that he desires, the team agrees on a set of criteria defining what a problem is. When describing problems, it is not enough merely to state a condition. The team must also describe the objective the condition prevents them from achieving. The form of a problem statement, therefore, is: Because of X, we are unable to do Y. This ensures that the cause-and-effect relationship is well-defined.

For example, instead of merely stating that DP staff turnover is too high, the team should say, "Because turnover is too high, we are unable to staff critical applications development teams." The second part of the statement helps the team understand the nature of the associated objective. Without this understanding, the team may end up with programs that are unjustified or that fail to meet the underlying need.

Defining objectives. There are three basic classes of objectives: problem-oriented, opportunity-oriented and basic management objectives.

Problem-oriented objectives are merely a restatement of the problems the team has just defined. Using the previous example, the objective might read: "Reduce DP staff turnover to a level that will enable us to staff all high-priority application teams." In this example, the objective should start with an action verb, then describe the "what" in the first half of the sentence and the "why" in the second half.

The other two types of objectives use the same format, although they are not based on the need to overcome a problem.

An example of an opportunity-oriented objective is: Establish a graphics support team to ensure that we can take advantage of potential productivity improvements when new graphics technology is installed.

A basic management objective is: Establish a program to deliver this year's committed systems on time and within budget in order to meet this year's management-by-objective goal.

After completing this part of the agenda, the team can list the identified objectives. This is vital for a number of reasons. First, it enables the team to select from a series of potential objectives. There are always more things to do than resources with which to do them. Listing the objectives enables the team to allocate deliberately scarce resources for the most important objectives. This, more than any other step, is the secret to successful planning — not just doing things right, but doing the right things.

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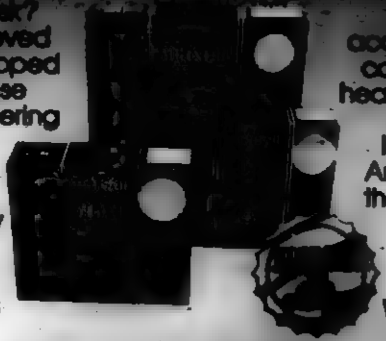

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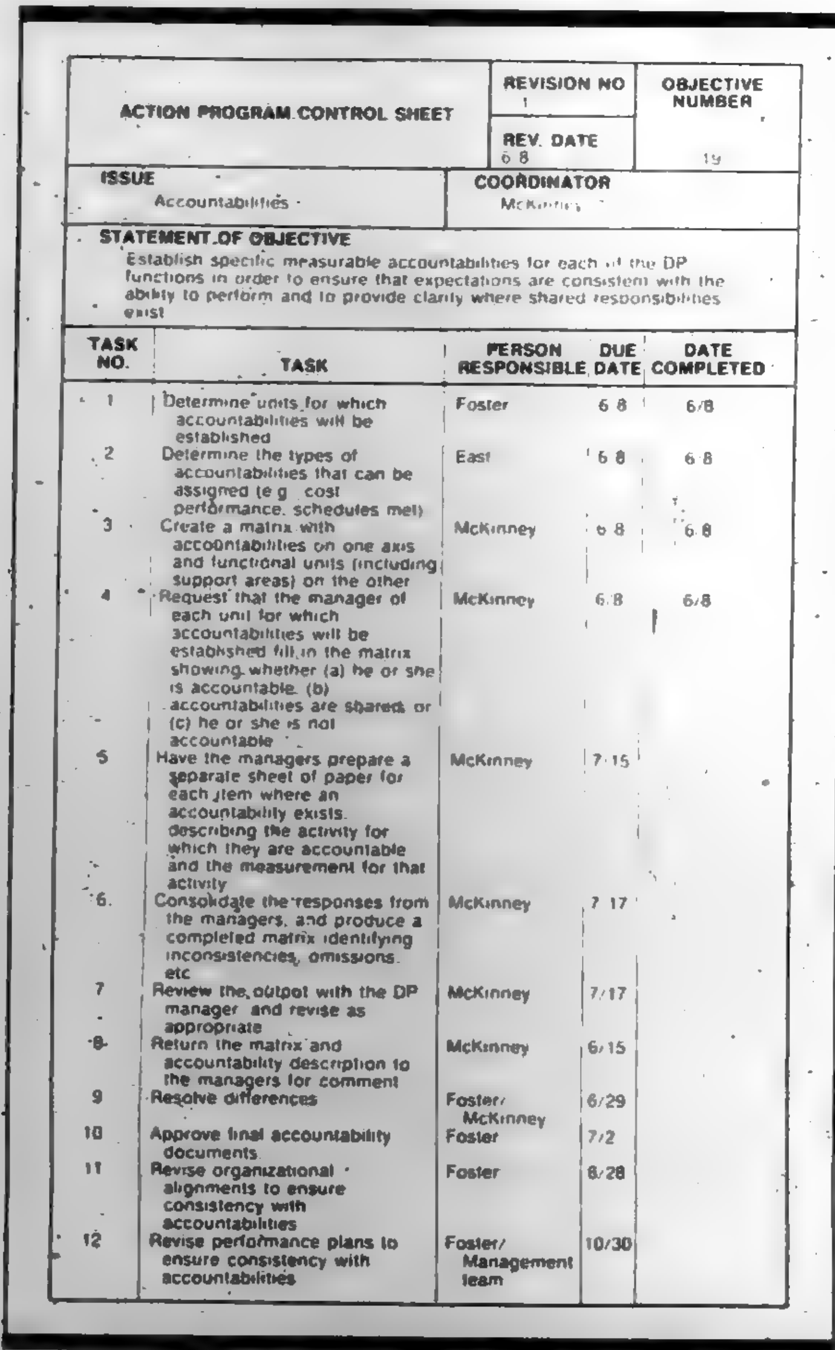

ACTION PROGRAM CONTROL SHEET

REVISION NO
1

REV. DATE
6 8

OBJECTIVE NUMBER
19

ISSUE
Accountabilities

COORDINATOR
McKinney

STATEMENT OF OBJECTIVE
Establish specific measurable accountabilities for each of the DP functions in order to ensure that expectations are consistent with the ability to perform and to provide clarity where shared responsibilities exist

TASK NO.	TASK	PERSON RESPONSIBLE	DUE DATE	DATE COMPLETED
1	Determine units for which accountabilities will be established	Foster	6 8	6/8
2	Determine the types of accountabilities that can be assigned (e g cost performance, schedules met)	East	6 8	6 8
3	Create a matrix with accountabilities on one axis and functional units (including support areas) on the other	McKinney	6 8	6 8
4	Request that the manager of each unit for which accountabilities will be established fill in the matrix showing whether (a) he or she is accountable (b) accountabilities are shared or (c) he or she is not accountable	McKinney	6/8	6/8
5	Have the managers prepare a separate sheet of paper for each item where an accountability exists, describing the activity for which they are accountable and the measurement for that activity	McKinney	7/15	
6.	Consolidate the responses from the managers, and produce a completed matrix identifying inconsistencies, omissions, etc	McKinney	7 17	
7	Review the output with the DP manager and revise as appropriate	McKinney	7/17	
8	Return the matrix and accountability description to the managers for comment	McKinney	6/15	
9	Resolve differences	Foster/ McKinney	6/29	
10	Approve final accountability documents	Foster	7/2	
11	Revise organizational alignments to ensure consistency with accountabilities	Foster	8/28	
12	Revise performance plans to ensure consistency with accountabilities	Foster/ Management team	10/30	

Figure 1. Sample Action Program Control Sheet

jectives rather than a list of problems changes the team members' philosophical viewpoint. Instead of being reactive problem solvers, they are proactive achievers. People who call themselves problem solvers acknowledge that someone else is pulling strings and that they are not in control of their time or efforts.

Selecting priorities. A good method for selecting priorities is simply to let each team member vote on the objectives. A high/medium/low ranking system works best. There is a tendency to rank too many objectives as medium, but at least this method points out the things that must be handled immediately. Of course, even low objectives are important. The team must, however, focus on things that must be done, rather than on things they would like to do. A set of criteria for selecting objectives can be useful in this regard.

At first, the team should limit itself to four to eight objectives, since the tasks that must be completed to meet those objectives are usually added to the team members' normal job responsibilities. Burdening these people with an unreasonable amount of work can doom the plan to failure. As experience is gained and initial achievements are realized, new objectives can be added.

Action programs. An action program is a logical method of executing a plan by breaking down an objective into specific tasks. Once this is done, responsibilities are assigned to each of the tasks and a schedule of dates is established. Figure 1 is a typical action-program control sheet. The last column can serve as a tool for managing execution. The last item on the agenda is establishing a technique for managing the action planning process, which is discussed later.

Project Planning Session Agenda

A project planning session is held to establish a plan for a specific project — for example, the development of an information systems plan, a DP facilities plan, a new graphics marketing program or an implementation program for a specific DP project. All these activities have two characteristics in common: They normally have discrete starting and ending points and one person is usually given responsibility for the activity. The project planning agenda has several similarities to the management review process. The introduction is essentialy the same as for a management review.

Defining the mission. In defining the mission for which the task force has been convened, each person in the group should assume the point of view of the project manager and should not be concerned with the role he will play in the project.

In nearly all cases, the mission statement is one complete sentence, which should be free of prejudice. An example of a narrow mission statement is: Develop a plan to implement the new ABC computing system. A broader statement, far more relevant to the needs of the organization, would be: Create an information resource management plan that will provide accurate, timely, easily accessible information to facilitate decision making, control and reporting during a period of rapid growth and diversification.

Establishing purpose. Next, it is necessary to establish the session's purpose. At first, this may appear to

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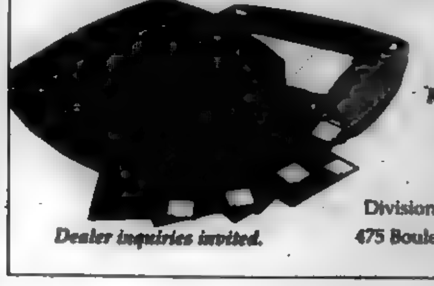

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be the same as the project team's purpose, but there is a significant difference. The latter defines where the team wants to be six to 12 months later, when the project is completed. The purpose of the session defines where the team wants to be two days later.

Including the words "create a plan to" in the mission statement defines the purpose of the session. This may seem trivial, but most teams have trouble distinguishing between actually executing the plan and *defining the process* needed to execute the plan. This simple step eliminates this problem by specifically asking the team to describe the process for executing the plan.

Identifying project elements. Because projects are normally rather large, it is appropriate to break them into major sections before proceeding to the task level. These major items are called elements.

The elements are identified by asking each person to state what he thinks must be accomplished to complete the project. This procedure provides for maximum input from the team members. An individual can seldom do a better job defining tasks than can the team as a whole.

Pert network. The next step is to develop a performance evaluation and review technique (Pert) network to show the predecessor/successor relationships for execution of the elements (see Figure 2). The notation in this figure has been modified for simplicity.

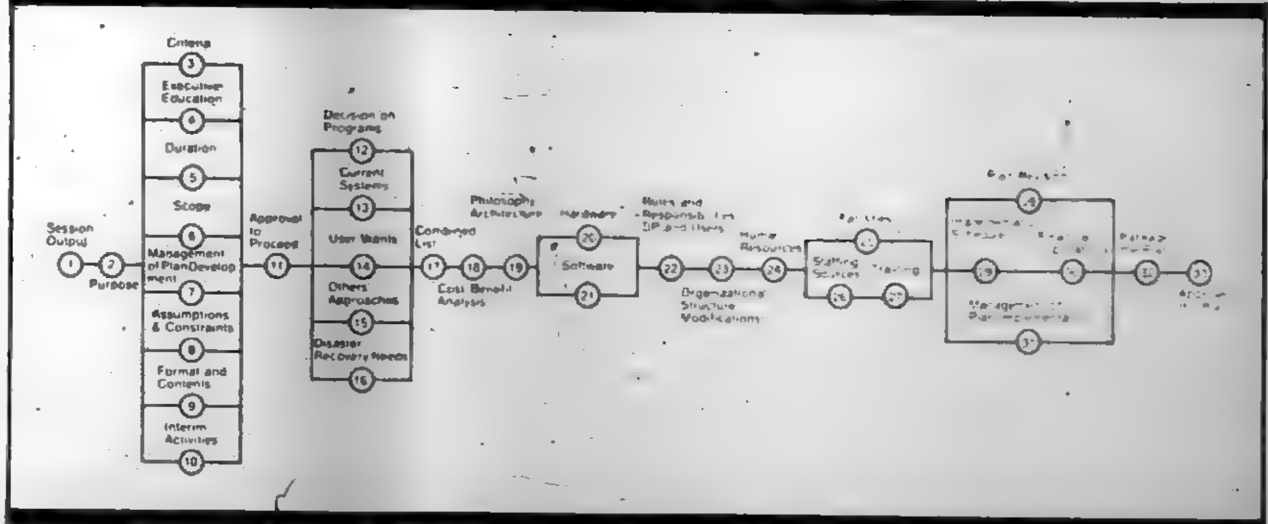
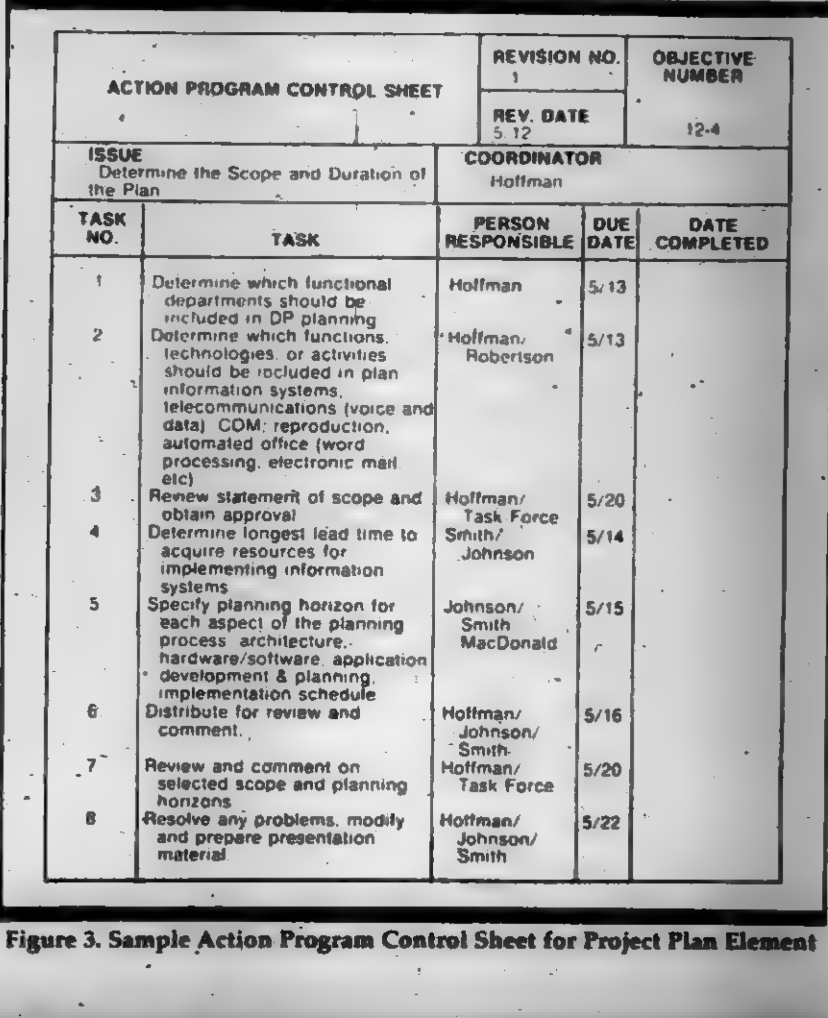


Figure 2. DP Planning Pert Chart

Redefining elements. The Pert chart provides a context for the elements. It is necessary to redefine the elements by combining nearly identical activities and determining the basic activity that must be accomplished within each element. This is a vital step in the process and can usually be accomplished quickly.

Implementation schedule. Once the redefined elements are accepted and the Pert network is finalized, the team gets its first overview of the project and can establish a preliminary timetable. This can be accomplished either by forward scheduling (assuming no time constraints) or back scheduling (assuming a deadline for project completion). A combination of forward and back scheduling is usually best. Dates can be added to the Pert chart to indicate when the elements must be done.



ACTION PROGRAM CONTROL SHEET

REVISION NO. 1

REV. DATE 5 12

OBJECTIVE NUMBER 12-4

ISSUE Determine the Scope and Duration of the Plan

COORDINATOR Hoffman

TASK NO.	TASK	PERSON RESPONSIBLE	DUE DATE	DATE COMPLETED
1	Determine which functional departments should be included in DP planning	Hoffman	5/13	
2	Determine which functions, technologies, or activities should be included in plan information systems, telecommunications (voice and data) COM; reproduction, automated office (word processing, electronic mail etc)	Hoffman/ Robertson	5/13	
3	Review statement of scope and obtain approval	Hoffman/ Task Force	5/20	
4	Determine longest lead time to acquire resources for implementing information systems	Smith/ Johnson	5/14	
5	Specify planning horizon for each aspect of the planning process architecture, hardware/software, application development & planning, implementation schedule	Johnson/ Smith MacDonald	5/15	
6	Distribute for review and comment.	Hoffman/ Johnson/ Smith	5/16	
7	Review and comment on selected scope and planning horizons	Hoffman/ Task Force	5/20	
8	Resolve any problems, modify and prepare presentation material	Hoffman/ Johnson/ Smith	5/22	

Figure 3. Sample Action Program Control Sheet for Project Plan Element

Action programs. As in the management review, the development of action programs entails establishing the specific tasks within each element, along with responsibilities and due dates. Figure 3 is a typical action-program control sheet for an element of a project plan.

Managing plan development. Establishing a process to manage the plan's development ensures that the necessary resources are allocated, at least for the first parts of the plan, and defines the review process for ensuring that the plan remains on schedule. Weekly, biweekly or monthly review meetings should be scheduled. These meetings should involve the implementation task force, which is not necessarily the same as the planning task force (although it is advantageous for as many of the implementors as possible to participate in the planning).

Role of Facilitator

To ensure success, it is important to appoint someone to act as facilitator for the meeting. This person must understand the planning process, have experience leading such meetings and be able to gain the respect of the participants. In addition, the facilitator must not appear to have a vested interest in the outcome (other than the desire to ensure that the plan produces the expected results).

In a management review, using an outsider with these attributes can be beneficial. Many sponsoring executives have remarked that, even though they used essentially the same agenda, the session without a facilitator became just another staff meeting. This often occurs because the senior executive unintentionally dominates the session.

A facilitator can help the senior executive play a low-key role much more easily than someone who works within the organization. This low-key role is vital to ensure full participation by the other team members.

A facilitator can also encourage reluctant members to participate more and, with enough experience, can tell the difference between a true

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agreement and one in which some members gave in to stronger members.

Even the project planning session can benefit from an outsider, because the role of project manager often does not exist within the organization and it is hard for all individuals to think in terms of this role. Most importantly, the facilitator can ensure that the team members' creativity is drawn upon at the beginning of the planning process, so that the output is not just another business-as-usual plan.

Whoever facilitates or leads the session must always remember that the session belongs to the team rather than to the senior DP executive or the project manager. The facilitator's responsibility is to supply a methodology, keep the session moving, manage the time, encourage members when necessary and control them when appropriate — but not to dictate the output.

Implementation must follow effective management principles. After the first step — planning — the organization must organize effectively in order to establish a structure to support the plan. Execution of a plan is much more difficult if the organizational structure is at odds with the strategies involved or if the lines of authority are misunderstood or poorly defined.

Staffing is also vital, since a plan must be supported by the appropriate people. Nothing is more frustrating than increasing a full-time employee's work load by half as much he had before the plan was developed and expecting him to complete it all successfully.

The integrity of the organizational structure should not be violated. If people outside the scope of the normal organizational structure are assigned to the project or to specific task forces, their managers must be advised. This seems obvious, but this step is sometimes forgotten in the initial enthusiasm of the action programs.

Controlling Implementation

As mentioned before, periodic progress reviews should be held. For large projects, daily meetings may be appropriate; in other cases, weekly, biweekly or monthly meetings might be better. For the management review process, between 15 and 30 minutes should be allocated during a monthly staff meeting to check on the status of the activities managed by the plan.

The purpose of these meetings is not to discuss the content of the action programs in detail: It is to determine whether things are on schedule. They also provide an opportunity to change the schedule or to delete or add objectives.

The reviews must be held at regular intervals. This keeps everyone aware that senior DP management expects results.

If schedule changes are necessary because of changing conditions, project members responsible for tasks following the one being deferred should be advised of the change so they can better allocate their work loads.

Team planning has been extremely effective in helping organizations achieve their objectives. Much has been written about the Japanese style of management, which uses some of these principles. While American value systems may be different from those of the Japanese, teamwork is not foreign to American sensibilities.

While still fostering the entrepreneur's desire for achievement, these planning techniques enable an organization to pursue its goals in a coordinated and cooperative way. To be effective, team planning must be part of the regular management process. Planning out of context is useless and can, in fact, cause significant damage, since it fosters a feeling of irrelevancy.

About the Author

Donald Gertsman is president of Gertsman & Associates, a West Los Angeles consulting firm specializing in data processing management.

Before starting his own firm six years ago, Gertsman worked for 17 years at IBM. In his consulting work, he has led more than 600 management planning teams at more than 200 companies in a broad range of industries.‡

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Baby Bell Offerings Designed to Meet Processing Needs

MORRISTOWN, N.J. — American Bell, Inc.'s Advanced Information Systems has announced a six-pronged effort to address the internal processing and external transport needs of the office and larger business environments.

The offerings include the Dataphone Multiplexer, the Dataspeed 4420 and 4430 asynchronous terminals, the Comm-Stor Line Control Unit, the Teleprinter 1000 and a touch-screen version of its previously announced Dataspeed 4540 Terminal, the Dataspeed 4540 Touch Screen Terminal.

The Dataphone Multiplexer is said to allow as many as 24 ports to be concentrated onto one or two data channels at speeds of 9.6K bit/sec. The ports are individually programmable to accommodate a variety

(Continued on Page 73)

Systar Front-End Unit Targets IBM SNA Users

SAN JOSE, Calif. — Systar Corp. has introduced Lodestar, a communications front-end processor that reportedly provides multiple-switching capabilities and access to IBM System/34 and /38 data bases for users with IBM's Systems Network Architecture (SNA).

The multiple-switching capability of Lodestar introduces for the first time simultaneous host sessions, giving users the ability to log on in a single, day-long session, which covers rapid selectable access to all network-tied hosts, the vendor said.

Users from IBM 5251 terminals can switch back and forth to multiple IBM System/34 and /38 data bases at any remote location on the SNA network. In this way, multiple data bases directly communicate with dispersed terminal workstations, without being tied to a central mainframe. Instead, all host and terminal lines physically connect to a single Series/1 minicomputer, communications-driven by Lodestar software.

Lodestar forms distributed networks of IBM System/34 and /38 hosts and 5251 terminals through conditioned leased lines. On the terminal side, it supports up to 150 remote devices, including all types of IBM 5250 printers through the fastest of the line, the 5225s, as well as seven multidropped leased lines. On the host side, it supports up to seven System/34 and/or System/38 data bases under Systar's standard application or by option, up to 14 hosts.

The Series/1 serves as the single communications processor to all hosts and devices across a Lodestar network. Lodestar couples the Model 11 cluster technique with multipoint lines to realize a maximum number of devices supported by the Series/1. The front-end then passes through the devices to each System/34 and /38 while occupying only one host port, realizing a maximum number of terminals supported by a System/34 and /38.

A Lodestar control center, the Network Control Console, reports the status of all terminals, lines and computers in the network, provides message broadcasts, displays usage statistics and allows for the network's dynamic reconfiguration without taking down the system, the spokesman said.

The cost of the product is tied to Systar's elevated program levels. Entry-level, standard and large-scale run from $20,000 to $50,000, including options, the vendor said from Suite 208, 1762 Technology Drive, San Jose, Calif. 95110.

Forecast From 'Father of Packet Switching'

Bandwidths Seen Going Down

By Jim Bartimo
CW Staff

BURLINGAME, Calif. — While most communications experts are preaching the need for higher bandwidths in voice communications, the father of packet switching believes that bandwidths will go down.

Larry Roberts, president of the worldwide courier service DHL Corp., said in an interview recently that higher bandwidths will become unnecessary when large-scale integration technologies and voice compression allow voice transmissions to take place over smaller bandwidths.

Predicting voice compression rates of 4K bit/sec by 1990, compared with today's standard 64K bit/sec, Roberts said, "If you analyze the trend in voice compression, you'll see that [the bit/sec rate] is decreasing."

Voice compression technology from AT&T and Satellite Business Systems can now allow voice transmission at 32K bit/sec, but implementation is not economically feasible yet, Roberts said. "By 1984, transmissions of 16K bit/sec will be attractive," he said.

Bandwidths will come down because although "users want more bandwidths for more things, they aren't willing to pay for it," Roberts said. Compressed voice will allow voice transmission at a lower cost and make room for other services on the line.

Roberts became known as a trend spotter and the father of packet switching when, from 1967 to 1973 he helped the Department of Defense develop Arpanet, the first packet-switched network. In the 1970s, Roberts founded GTE's Telenet Co.

That voice compression and large-scale integration technology will bring bandwidths down "is something very few peo-

(Continued on Page 72)

System Out for ITT Courier Users

HYANNIS, Mass. — Fibronics International, Inc. has unveiled a data distribution system for ITT Courier users said to transmit data two miles over fiber-optic cable.

The Fibronics FM-1680 Data Distribution System reportedly connects all 32 output channels from the Courier 7411 terminal controller via one standard, RG-62A/U coaxial cable. The FM-1680 unit reportedly operates with Courier's 2700 and 2790 terminals and Model-8700 printer.

The system's design features flexible network architectures in point-to-point, multidrop and star configurations. The system operates using a coaxial hookup to a maximum of 3,000 feet. A Fibronics fiber-optic interface permits data transmission up to 10,000 feet, the vendor said.

A full 32-port system is approximately $10,000. Designed in eight-port increments, the basic system is priced in the $6,000 range from Fibronics International, 218 W. Main St., Hyannis, Mass. 02601.

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Multidrop Concentrator Supports 16 Dumb Units

CHATSWORTH, Calif. — Micom Systems, Inc. has introduced a multidrop concentrator said to provide polled terminal support for up to 16 dumb asynchronous terminals located in as many as 16 sites. The terminals are serviced by a single telephone line. No changes to hardware or software are necessary, according to a vendor spokesman.

The Micro900/2 Multidrop Concentrator allows both telephone line costs and modem costs to be reduced by using one multidropped phone line instead of a different line for every remote site and by using a single modem at the host location, according to a vendor spokesman.

Master units are available with four, eight or 16 channels, starting at $2,050 for the four-channel version. Node units are available in one-, two-, four- and eight-channel models, starting at $900. More information is available from Micom Systems, located at 20151 Nordhoff St., Chatsworth Calif. 91311.

ACC Aid Out for DEC Users

SANTA BARBARA, Calif. — Associated Computer Consultants, Inc. (ACC) has announced that its protocol package is now available for users of Digital Equipment Corp. machines. The package is compatible with the Xerox Corp. Ethernet controllers.

The Network Systems Protocol Package implements the Xerox network systems protocol in a layered manner, offering the application programmer the ability to name, locate and utilize high-level processing services in a distributed environment, a vendor spokesman said.

It is said to provide simple interprocess communications between distributed resources and a variety of local-area network hardware implementations.

Two versions of the package are available, ranging in price from $4,500 to $9,500. More information can be obtained by contacting Associated Computer Consultants, 720 Santa Barbara St., Santa Barbara, Calif. 93101.

Class Offers Tool Guide

SAN JOSE, Calif. — The California Library Authority for Systems and Services (Class) has announced the publication of a guide detailing intelligent terminal software.

"Communications Software for Microcomputers" is said to respond to the widespread interest among librarians in using microcomputers for dial-up data base searching.

The publication reviews operational aspects of the software and other communications applications for microcomputers such as electronic mail, microcomputer-to-microcomputer file transfer and use of smart terminal software to download data into local files, according to Class.

The publication is available for $10.50 for Class members and $12.50 for all others. More information is available from Class, located at Suite 101, 1415 Koll Circle, San Jose, Calif. 95112.

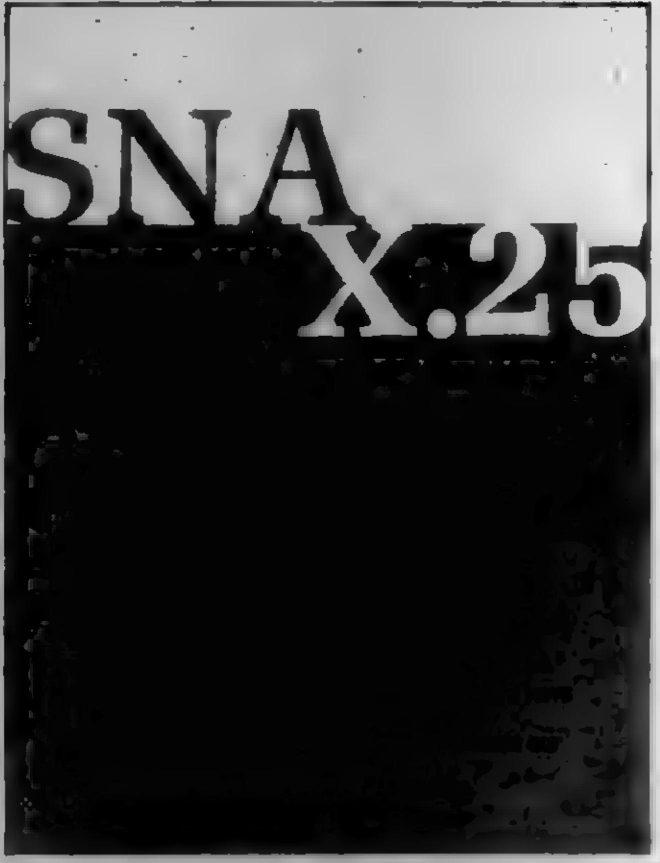
Bandwidths Lowering?

(Continued from Page 71)

ple have thought about," Roberts said. "People tend to think in the short term. I analyze trends and that's how packet switching evolved."

When voice signals are digitized and compressed, the cost of voice transmission will drop. Since many other services will also be resident on the line by 1990, Roberts forecast that one of them will carry the major cost of the line.

"The mind-set right now is that voice pays the bill; that has to change," Roberts said. "A totally new entrant has to take over and become the predominant use. It could well be an entertainment service that would pay the bill.".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Will Switch to Bell Lab's Unix

Arm Beefs Up Data-Net

FAIRPORT, N.Y. — Arm Associates, Inc. has expanded its Data-Net computerized electronic mail and information service.

Data-Net now provides electronic mail, classified advertising, electronic shopping, financial and game programs and Western Union, Inc.'s Mailgram service. The expanded system will also reportedly switch from Arm's operating systems to Bell Laboratories' Unix operating system in either a menu-driven, user-friendly format or at the operating system level. The user determines his format.

Terminal connect rates start at $3/hour for 300 bit/sec users and go to $4.20/hour for 1,200 bit/sec users. There is no initiation fee. The firm is located at 9 Clarkes Crossing, Fairport, N.Y. 14450.

Augat Unveils Data Link

ATTLEBORO, Mass. — Augat Fiberoptics, Inc. has announced a data link that can reportedly transmit digital data at rates up to 25M bit/sec.

With a 16-db system loss budget, the M25 allows data set controller transmission lengths greater than 2 kilometers. In addition, the unit reportedly can transmit an analog signal up to 10 kHz.

Two connector systems are offered, including the firm's data set controller designed to newly proposed Electronic Industries Association standards. The M25 data link costs $440 from the firm at 40 Perry Ave., P.O. Box 1037, Attleboro, Mass. 02703.

Baby Bell Offers Six Products

(Continued from Page 71)

of synchronous and asynchronous equipment. The multiplexer will be available April 1 in eight- and 24-port versions for $6,850 and $8,450, respectively. Four-year leasing prices are $250/mo and $530/mo, respectively.

The Dataspeed 4420 for dial-up use and the 4430 for multipoint private lines are two buffered display CRT terminals said to offer flexible editing capabilities in a human-factor design. The 4420 is available now for $4,800 or $198/mo for a four-year lease. The 4430 will be available in May for $5,700 or $120/mo for a four-year lease.

The Comm-Stor Line Control Unit can operate in conjunction with a host computer or as a stand-alone unit, allowing users to prepare and send messages without tying up the mainframe processor, a vendor spokesman said.

The control unit will be available April 1 for $21,500 or $675/mo for a four-year lease.

The Teleprinter 1000 is a buffered printing terminal available in receive-only and keyboard send-receive configurations that features speeds of 120 char./sec. and 1,200 bit/sec. The printer is available now for $185/mo for a two-year lease.

The Dataspeed 4540 Touch Screen Terminal is said to allow a user with no computer background or typing skills to communicate with a data base through the touch-sensitive screen.

By pointing to choices displayed on the screen, the user can ask for information, answer questions or make transactions, according to a vendor spokesman. The terminal is available now for $5,000 or $170/mo for a four-year lease.

More information about these products is available from American Bell Advanced Information Systems, 100 Southgate Pkwy., P.O. Box 1955, Morristown, N.J. 07960.

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Intelligent Modem/Dialer Out

MOUNTAIN VIEW, Calif. — An intelligent modem/dialer said to incorporate its own 8-bit microprocessor and capable of communicating data over telephone lines at speeds of up to 12K bit/sec is available from Cromemco, Inc.

The MDM-12000 is a full-duplex modem designed for direct connect. A single RS-232C port reportedly serves the dual function of controlling the built-in microprocessor's functions before entering the actual data mode and transferring data to and from the telephone after entering the data mode.

The MDM-12000 costs $1,495 from Cromemco, 280 Bernardo Ave., Mountain View, Calif. 94043.

Nu Data Offers A720 Converter

LITTLE SILVER, N.J. — Nu Data Corp. has announced a protocol converter that provides up to 16K bytes each of read-only and random-access memory, two 8-bit parallel ports and up to three full-duplex serial channels.

The A720 reportedly features an RS-232C interface that supports asynchronous communications as well as character- and bit-oriented synchronous communications. Modular software is said to configure the ports to the application and emulate higher protocol levels.

The A720 costs $1,650 from 32 Fairview Ave., Box 125, Little Silver, N.J. 07739.

Mux Line Aids Statistics Access

KIRKLAND, Wash. — Teltone Corp. has announced the M-860 line of statistical multiplexers said to offer composite link speeds of up to 76.8K bit/sec.

The units can be configured with between eight and 32 asynchronous input channels at individually programmable speeds of 50 to 9,600 bit/sec. Interactive menu-driven programming provides authorized personnel to access statistics and diagnostic routines, the vendor said.

An eight-channel RS-232C version costs $2,400, the vendor said through P.O. Box 657, 120th Ave. N.E., Kirkland, Wash. 98033.

Link Extends RS-232C Cable

MINNEAPOLIS — Honeywell, Inc. has introduced the first in a series of fiber-optic data links. The RS-232C link is a plug-compatible replacement for most four- and nine-wire RS-232C extension cables.

The module HFM 5005 kit provides a method of extending cables beyond the 50-ft limit of a standard RS-232C while eliminating ground loops and providing electromagnetic interface/radio frequency interface resistance, data security and reduced error rate. The link supports full-duplex asynchronous data rates up to 56K bit/sec.

Each HFM 5005 kit includes transmitter, receiver and power module for $165.

More information is available from Honeywell Optoelectronics Division of Honeywell, Inc., 830 E. Arapaho Road, Richardson, Texas 75081.

Local Data Upgrades Datalynx

TORRANCE, Calif. — Local Data, Inc. has upgraded its Datalynx 3270 protocol converter to include hardcopy keyboard-send-receive (KSR) terminals among the asynchronous Ascii devices that can be operated with a binary synchronous host.

A plug-in Paper/3278 firmware module is available for $50 to retrofit Datalynx/3270s now in use. The protocol converters are said to make any 80-col. or 132-col. KSR terminal appear to the host as an IBM 3270 display terminal.

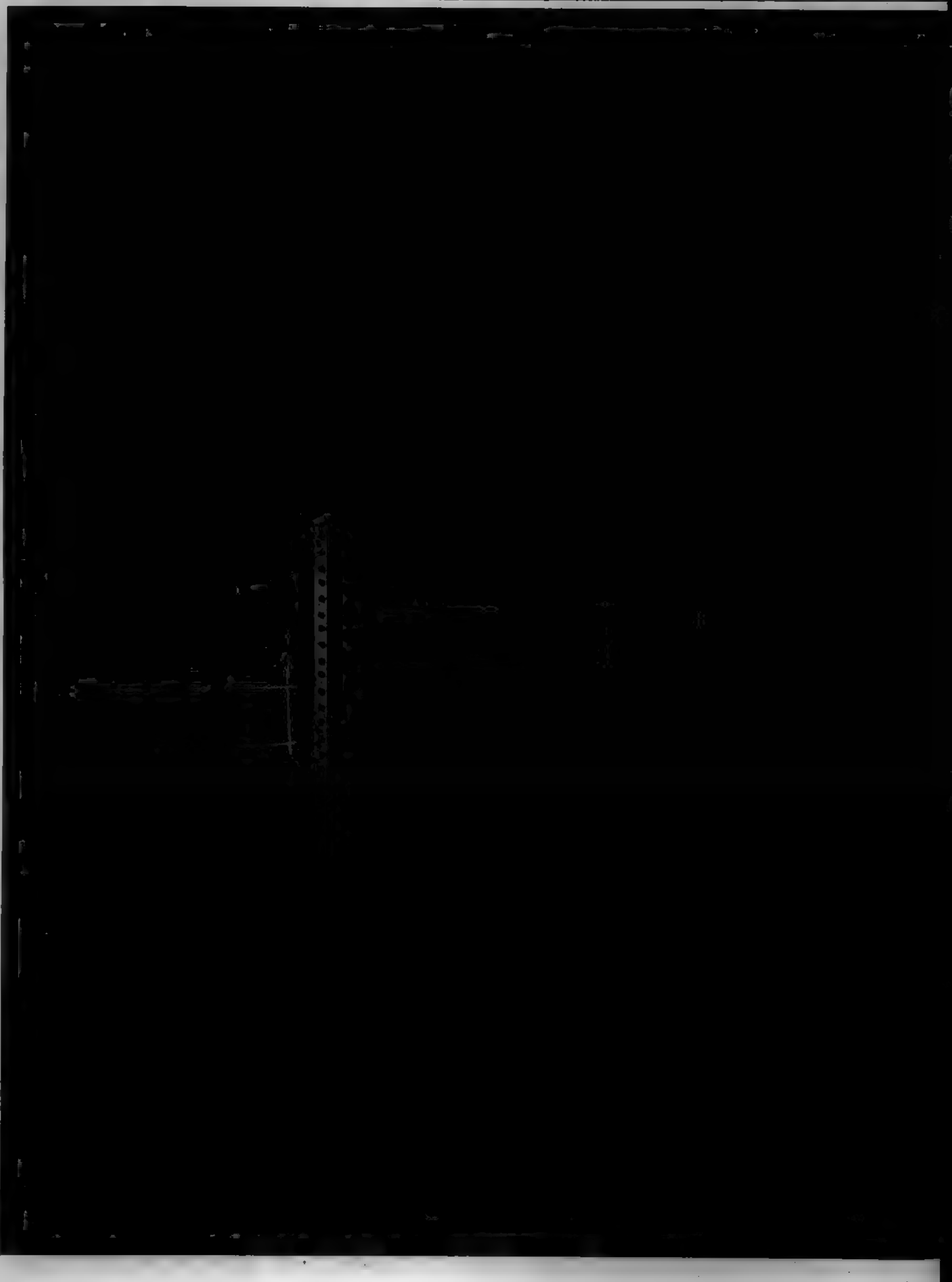
Prices of Datalynx remain the same as before the upgrade: $1,450 for the Datalynx/3270 and $4,000 to $6,000 for the Datalynx/3274. Local Data is located at Suite 706, 2701 Toledo St., Torrance, Calif. 90503.

Color Graphics Terminals Unveiled for Univac 1100

NORCROSS, Ga. — Intecolor Corp. has introduced two color graphics terminals said to operate with the Sperry Univac application generator, Mapper, for users of the Univac 1100 series. Both terminals emulate and are plug-compatible with the U-200 protocol.

The Intecolor 9001R/M is designed for industrial use, the 8001R/M for office use. Both terminals feature support of 16 terminals clustered on a Univac multiplexer, eight foreground and eight background colors, 32K bytes of random-access memory, two asynchronous RS-232 channels and one synchronous channel, a vendor spokesman said.

The 9001R/M is available for $6,350, the 8001R/M for $3,995 from Intecolor Corp., Intecolor Drive, 225 Technology Park, Norcross, Ga. 30092.



Enhancement Announced For RAV/Chips Module

NEW YORK — RAV Communications, Inc. has announced a new release of its RAV/Chips Module telecommunications software for interbank and international money transfer.

Release 2.1 enhancements relate to book transfers, verification/release, payment entry and repair and communications. The improvements are said to provide smoother operation between the bank and its financial clearinghouse.

The RAV/Chips Module is part of a turnkey system based on a Texas Instruments, Inc. DS 990 Model II computer with 64K bytes of memory, two TI 810 150-char./sec bidirectional printers, two CRT terminals and a 64K-byte communications processor. The system is priced at $60,000 or $95,000 for two systems, from 90 West St., New York, N.Y. 10006.

VIA Directors Announce Officers

WASHINGTON, D.C. — The Board of Directors of the Videotex Industry Association (VIA) has elected its officers for 1983-84.

Reelected as chairman was Larry T. Pfister, vice-president of Time Video Information Services.

Incoming officers are Samuel Berkman, vice-chairman, who is division manager of product development at American Bell, Inc.; William W. Seelinger, secretary, who is Manager of Videotex Market Development for IBM; and Larry G. Blasko, treasurer, who is director of information technology and deputy director of domestic communications for the Associated Press.

VIA is located at Suite 200, 2000 L St., N.W., Washington, D.C. 20036.

Graphics Board Fits VT100

SACRAMENTO, Calif. — Selanar Graphics Corp. has announced its SG480 graphics upgrade for Digital Equipment Corp.'s VT100 series alphanumeric terminals.

The SG480 graphics upgrade reportedly is patterned after Selanar Graphics 100 products and features Tektronix, Inc. 4014 software compatibility and Selanar's native mode with a microprocessor-based vector generator to aid programming. Both the VT100 and Selanar Graphics memories can be displayed either simultaneously or individually for data on graphics applications.

Plot modes consist of normal, point and incremental plot, while vector variation modes include solid lines, dotted, dot-dashed, short dash and long dash line, the vendor said. Other features include transparent CPU to RS-232 printer port, 480-by-800 resolution, Tektronix, Inc. 4010 and 4014 emulation and field-installable tube and plug-in graphics circuit card.

The retrofit board, the SG480, is priced at $1,395. Selanar is located at 4212 N. Freeway Blvd., Sacramento, Calif. 95834.

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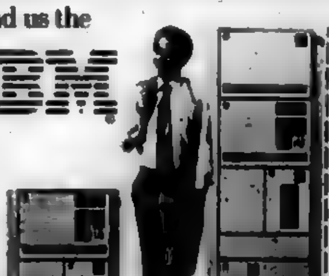

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Data Analyzer Menu-Driven

MONTGOMERYVILLE, Pa. — Digilog Network Control Division has announced a data communications analzyer with full keyboard progammability said to give top-of-the-line capabilities for about half the price of current models.

The Data Line Monitor (DLM) V reportedly offers a menu-driven programming method and language; electrically erasable read-only memory for running repeatable interactive tests; diagnostic, edit and update capabilities; X.25 frame and packet; and the DLM IV dual diskette subsystem, an optional mass storage unit.

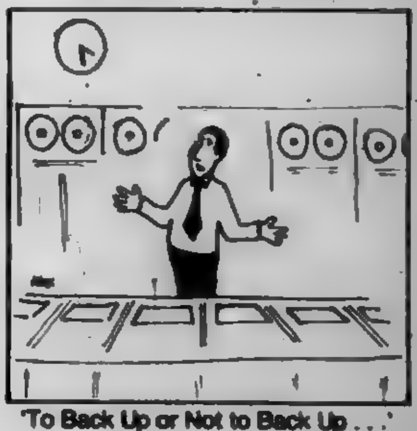
The analyzer costs $5,395, Digilog Network Control Division said, from 1370 Welsh Road, Montgomeryville, Pa. 18936.

Modem Runs At 1,200 Bit/Sec

CHICAGO — A 300- or 1,200 bit/sec autodial modem has been announced by U.S. Robotics, Inc.

The Auto Dial 212A, said to use only one-sixth the circuitry of comparable modems, operates at full- or half- duplex and contains an audible phone line signal monitoring system. The modem is Bell Laboratories 103-, 113- and 212A-compatible and features a self-test system.

The unit costs under $600 and carries a limited two-year warranty. The vendor is located at 1123 W. Washington Blvd., Chicago, Ill. 60607.



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14 years ago there was a small group of people with a very concise approach to software and how it might be applied to the freshly-minted concept of database management.

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Their first products were revolutionary in the sense that they brought the data processing world to a new way of thinking about the staggering amount of information they processed daily. Products such as IDMS recognized that data was a very dynamic entity – not something you stored away or carried about in voluminous paper print-outs.

Enhancements led to new techniques in data management. Programming aids made it possible to develop products uniquely tailored to individual requirements. Thorough documentation, testing, support and service made them a leader in the database world.

And thus, their small and loyal following became

a large and loyal one.

But in the minds of the small group of people who first proposed a rational approach to the database, the challenge hadn't been met. If anything, it had grown more diverse.

So the decision was made to put the Cullinane Database Systems name behind them. And replace it with a name that reflected a broader and fresher approach not only to database management but to the thorough integration of data throughout the entire corporation. The name is Cullinet.

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You'll see some very dramatic introductions in the area of personal computer software. In applications software for manufacturing and financial management. In decision support systems. In fact, there's little that isn't included under their broad net.

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So you can look at this as Cullinane's last ad. Or as Cullinet's first one.

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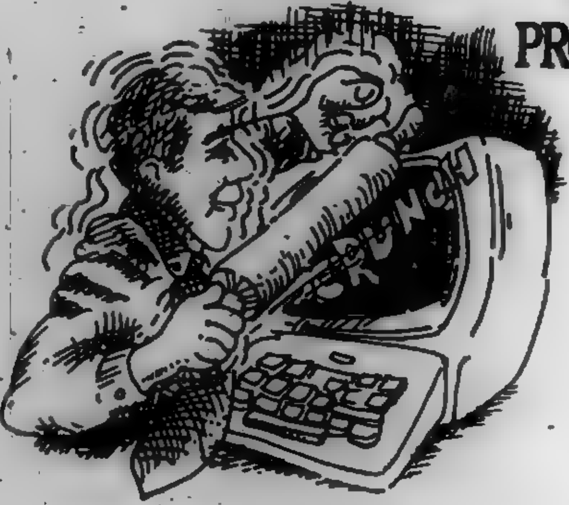

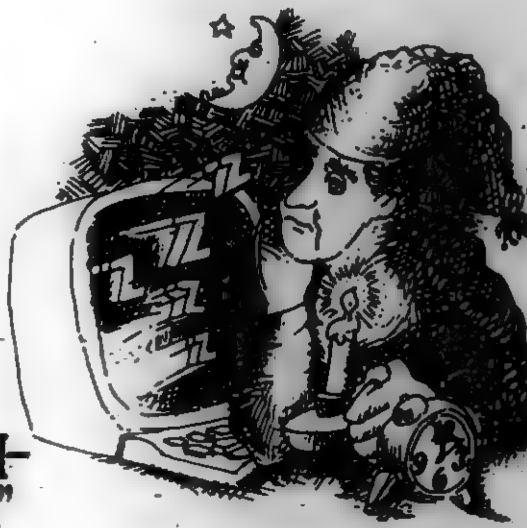

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No Need for In-House Programmer

Business System Handles Accounting

By Susan Blakeney
CW Staff

PORTSMOUTH, N.H. — A small business system that reportedly enables small businesses to automate their accounting and forms-oriented business procedures without the need of an in-house programmer has been unveiled here by Unidata Systems, Inc.

The Unidata 3000 is a Zilog, Inc. Z80-based integrated hardware and software system and features a vendor-developed application generator that allows users without computer expertise to create customized application programs based on routine business forms.

According to the vendor, the application generator has "embedded knowledge" that automatically performs most of the steps involved in programming, permitting the user to develop entire application programs on a prompted basis. Users are provided with built-in coaching functions, which allow them to produce forms in a fill-in-the-blank manner. After the user enters the information, the Unidata 3000 reportedly updates files automatically, sorts and collates information and generates or archives the documents.

Unidata 3000

In addition, the Unified software incorporates a data base manager, virtual memory management and dynamic key allocation. It operates under Unidata's proprietary operating system software and also features optional Digital Research, Inc. CP/M compatibility and menu-driven word processing capabilities, the vendor said.

The relational-like and hierarchical data base management system (DBMS) automatically organizes and maintains information in such a way that data from one form (program) can be recalled for use by any other because it works with variable length strings. Data is organized in the data base in a manual office forms filing system manner, which is automatically indexed and sorted as lists within lists, the vendor explained.

Linked to the DBMS is an interactive compiler and interpreter that acts as a data translator and coach, notifying the user of any programming mistakes. This function leads first users through methods for filling in blanks while the operating system coordinates work between the user and the system, Unidata said.

The vendor's Unisyn English-like language has a vocabulary of 70 words and minimal punctuation that is said to "understand" words alone and in context. It is a business-oriented language that boasts data base management access commands plus a set of arithmetic, logical, conditional and relational operations, according to

(Continued on Page 84)

ATS Micro Family 8086-Based, Boasts Trilevel Architecture

TORRANCE, Calif. — Cado Systems Corp. has announced the Tiger ATS family of Intel Corp. 8086-2-based microcomputers that employs a trilevel architecture allowing the systems to support simultaneously a large number of terminals without response degradation.

The ATS family consists of two members: the ATS 32, which offers 32 ports; and the ATS 64, which supplies 64 ports. Each system employs three different types of microprocessors: transaction processors, intranet processors and control biprocessors. Each microprocessor has dedicated random-access memory (RAM) and can share a global memory ranging from 256K- to 1M byte, the vendor said.

The Transaction processor handles short-duration transactions for up to eight terminal devices communicating at up to 19,200 bit/sec each, the vendor said.

The intranet processor is also said to incorporate the 8086-2 and serves as the system resource manager. The intranet processor is equipped with 32K bytes of private RAM and up to 16K bytes of dedicated programmable read-only memory.

The control biprocessor consists of an Intel 8089 dual-channel processor to interface with storage devices. The processor has an 8K-byte I/O buffer.

Capable of supporting up to 1.1G bytes of Winchester disk storage, the system costs between $30,000 and $250,000, depending upon configuration, the vendor said from 2771 Toledo St., Torrance, Calif. 90503.

Executes 1 Mips

Logic System Based on 68000

SUNRISE, Fla. — Logic Computer Corp. has unveiled the Logic Computer System, based on an 8-MHz version of Motorola, Inc.'s 68000, which executes approximately 1 million instructions per second (Mips).

The system has a 16-bit data path but internally features 32-bit registers and supports 32-bit operations, according to the vendor. The system can reportedly handle communications rates of serial I/O at 34.5 to 19,200 bit/sec, parallel up to 1M byte/sec. It offers a choice of storage media and a number of software packages for single- and multiuser processing. The software consists of the vendor's multiuser control system, Bell Laboratories' Unix System 3, a Cobol-based operating system and a Digital Research, Inc. CP/M Emulator.

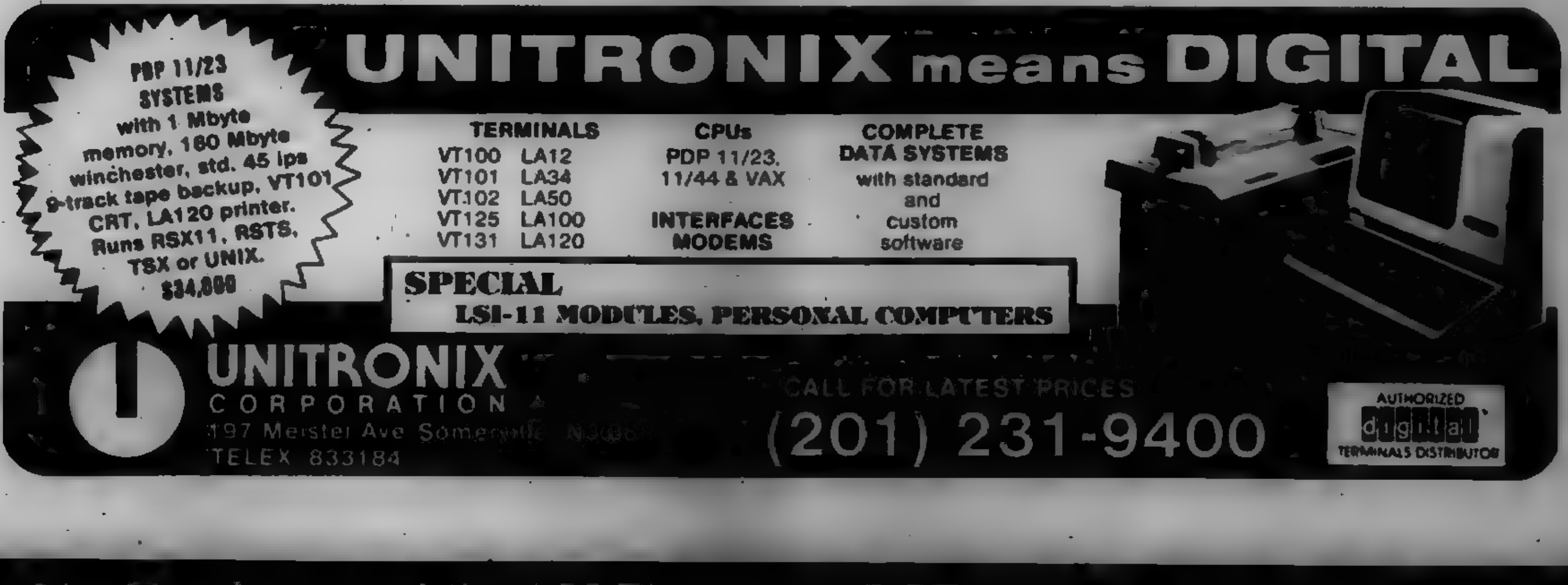
Pricing on the Logic Computer System starts at $7,720. Further details are available from the vendor at Suite 304, 7800 W Oakland Park Blvd., Sunrise, Fla 33322.

Low-Profile Micro Based on 68000

RENO, Nev. — Sage Computer Technology, Inc. has announced the Sage II, a low-profile version of its microcomputer based on a 16-bit Motorola, Inc. 68000 microprocessor.

The Sage II incorporates a half-height floppy disk drive that reportedly reduces the size of the unit by about 50%. The Sage II comes with 128K bytes of main memory, which can be expanded to 512K bytes.

Systems cost from $3,600, the vendor said from Suite 4, 35 N. Edison Way, Reno, Nev. 89502.



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Multiuser Hard Disk Fits DEC, Apple, IBM Micros

NORTHBROOK, Ill. — Prizm Computer Products, Inc. has introduced a 10M-byte multiuser hard disk with a 20M-byte streaming tape backup system for use with the IBM Personal Computer, the Digital Equipment Corp. Rainbow series and Apple Computer, Inc.'s Apple II, II + and III micros.

Prizm's hard disk unit is reportedly expandable to up to 80M bytes of formatted capacity and is capable of transferring at rates of 5M byte/min., according to the vendor. The disk was designed to connect with multiple computers for data file sharing so that several office applications can be performed simultaneously, the vendor explained.

The disk costs $4,195 for the 10M-byte system and $4,695 for the 20M-byte version. Prizm is based at 702 Landwehr Road, Northbrook, Ill. 60062.

For Syfa Network System

Distributed Processing Nodes Out

IRVINE, Calif. — Computer Automation, Inc. has announced low-cost distributed processing nodes for use in small or remote locations where work loads are not sufficient to justify larger configurations of its Syfa Network Processing System.

System Packages 1 and 2 are reportedly based on the vendor's Syfa 200 and 300 Network Processors. Package 1 includes an 8M-byte Winchester 8-in. hard disk drive and a 1M-byte floppy diskette drive. Package 2 has a 32M-byte Winchester 8-in. hard disk with a 1M-byte floppy diskette drive. Each package also includes:

- Power supply and chassis — either five-slot with Package 1 or nine-slot with Package 2, plus desk enclosure and console.
- A 64K-byte MOS memory plus disk controller.
- Four-port standard multiplexer with RS-232 compatibility for display stations, microcomputers, bar code readers and various data collection devices.
- Two Syfa Information Stations with cables.
- A 200 char./sec printer with controller and cable.

Package 1 costs $20,010 and Package 2 is priced at $23,150, a spokesman for Computer Automation said from 2181 Dupont Drive, Irvine, Calif. 92713.

Line Printer Announced

SKOKIE, Ill. — Teletype Corp. has unveiled a heavy-duty line printer that operates asynchronously at speeds up to 9,600 bit/sec at a maximum rate of 300 line/min.

The T300 features a 2,000-char. line buffer that reportedly compensates for any speed differential and allows buffer-full options for data flow control. It supports a number of minicomputer systems and can be plugged directly into any system with an RS-232 interface, the vendor said. Parallel interfaces are available.

The printer costs $5,500 from Teletype at 5555 Touhy Ave., Skokie, Ill. 60077.

Management System Unveiled

MANCHESTER, N.H. — Summa Four, Inc. has introduced a communications management hardware system designed for small businesses and branch offices of larger businesses.

The system is targeted for installations with less than 16 central office trunks. It operates on all types of telephone systems and is aimed at businesses with either the 1A2-type key systems or small electromechanical private branch exchanges, the vendor said.

A user authorization code provides accurate records kept by users within the system. Other standard features include account code billing, speed calling and six system-wide management reports.

The base system with printer is available for between $5,000 and $6,000 in an eight-trunk configuration. More information is available from Summa Four, 2456 Brown Ave., Manchester, N.H. 03103.

Bruning Cuts Easydraf² Fee

ITASCA, Ill. — Bruning has announced a 23% drop in price for its Easydraf² computer-aided drafting system. It has also redesigned the system by adding Motorola, Inc.'s 68000 16-bit chip to its architecture.

The new price for a complete turnkey system is $57,700, including Easydraf² program, Hewlett-Packard 9836 computer, two 5¼-in. flexible disk drives, HP 7580 D-size plotter, custom-designed desk and chair, installation and training.

The new program is said to emphasize speed, flexibility of drafting standards and a set of editing commands. A broad range of user requirements can be accommodated with Bruning's array of 18 hardware options, the vendor claimed. Also, computer-aided manufacturing applications can be accommodated with the use of a software interface.

More information is available from Bruning at 1800 Bruning Drive W., Itasca, Ill. 60143.

Ibis Illustration System Introduced for Artists

SEATTLE — Morgan-Fairfield Graphics has announced the Ibis Illustration System, based on the Beacon color graphics processor developed by Florida Computer Graphics Corp.

Designed for use by artists, illustrators and graphics designers, the system, which is based on a Zilog, Inc. Z80-A microprocessor, features access to 32 pen weights, user-definable colors, 256 colors and digital templates.

The turnkey system comes with a 5M-byte Winchester disk drive, a 640K-byte floppy disk drive, keyboard, digitizing tablet and electronic pen. The system costs $39,500, the vendor said through P.O. Box 5457, Seattle, Wash. 98105.

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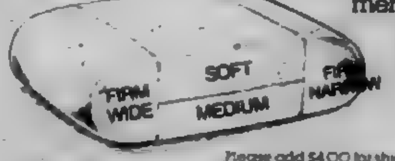

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Boast Large Capacities

Storage Subsystems Debut

COSTA MESA, Calif. — A line of mass storage subsystems boasting large capacities, data integrity and improved equipment reliability has been announced here by California Computer Group, Inc.

The Masstore subsystems consist of modular disk drives backed up by the user's selection of start/stop, streaming or cartridge-type magnetic tape drives. All subsystems are reportedly hardware- and software-compatible with the following minicomputers: Digital Equipment Corp.'s VAX-11, LSI-11 and PDP-11 machines; Data General Corp.'s Nova and Eclipse; Point-4 Corp.'s minicomputers; Texas Instruments, Inc.'s 990 and 600 series; and all 16- and 32-bit Perkin-Elmer Corp. machines.

The Masstore line is comprised of three products. The Masstore-1X was designed for applications with very large data bases. It can be equipped with one to four Fujitsu Ltd. Eagle Winchester disk drives to provide fast data access. Each drive has a maximum unformatted capacity of 474M bytes. Maximum formatted storage in the largest capacity configuration is 1,395M bytes, the vendor said. Pricing starts at $21,500.

The Masstore-2X was designed for office environments and features a top-loading, streaming magnetic tape drive. Prices for this line start at $27,850.

Masstore-3X is a tabletop/rack mount subsystem suited for small business applications, according to the vendor. This series is base priced at $13,000.

In a concurrent announcement, the vendor unveiled the Ultravax controller, a family of optimized minicomputer systems based on DEC's VAX-11 computers. This product line reportedly substitutes firmware-driven controllers on each bus to achieve maximum integration of peripherals, according to the vendor. Pricing begins at $43,950.

California Computer Group is headquartered at Suite G-10, 3303 Harbor Blvd., Costa Mesa, Calif. 92626.

Rugged VAX Announced

ORINDA, Calif. — Rugged Digital Systems, Inc. has announced specialized versions of Digital Equipment Corp. VAX-11 processors and accompanying disk subsystems, designed to operate in severe environmental conditions.

Designed for subsystems for military and industrial users of VAX-11 processors, the units are equipped with a protected chassis designed to offer insulation from shock, vibration, severe temperatures, humidity and dust, the vendor said.

The firm is offering two processors, the R/730 and R/750. The units employ the same basic electronics as DEC's VAX-11/730 and VAX-11/750. Both processors support DEC's VMS operating system as well as all VAX-11 applications, the vendor said.

The R/730 supports up to 5M bytes of main memory and includes a floating-point accelerator. The R/750 can support up to 8M bytes of main memory, a floating-point accelerator and a 4K-byte cache, the vendor said.

In addition, the firm has announced specialized versions of DEC disk subsystems designed to accompany the two systems. The R/RUA80 subsystem employs DEC's 14-in. Winchester disk drive and controller and supports up to 121M bytes of formatted storage with an average seek time of 25M byte/sec and a burst data rate of 1.2M bit/sec, the vendor said. The R/RU81 supports up to 456M bytes of formatted storage with an average seek time of 28M byte/sec. Systems cost from approximately $185,000, the vendor said from 45 Evergreen Drive, Orinda, Calif. 94563.

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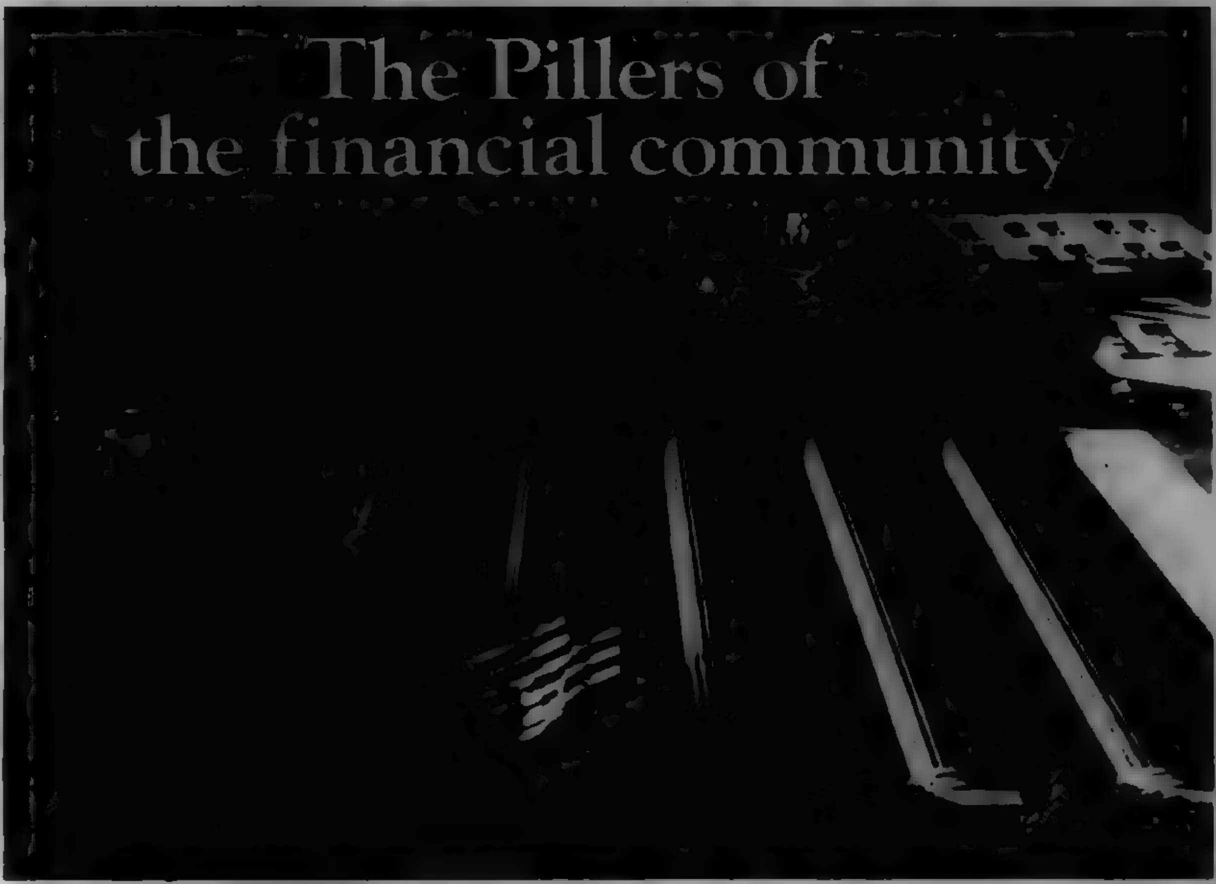

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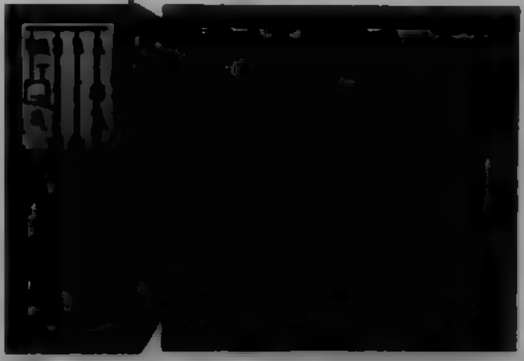
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Law Office Management, Info System Debuts

EUGENE, Ore. — A law office management and information system has been unveiled here by Western Computer Systems, Inc. that reportedly features multiple work stations, word processing, forms generation, billing, management reporting, financial accounting and interfaces for legal software services.

The Professional Office Management & Information System offers word and data processing configured in either a shared-logic or multiuser network environment, according to a vendor spokesman

The basic systems price starts at $9,960 and include 2 workstations, a printer and 10M bytes of hard disk Winchester memory and backup. This system can be upgraded to 24 workstations, multiple printers and 300M bytes of hard disk, the spokesman noted.

Western Computer Systems is headquartered at 1000 Bertelsen Road, Unit 1, Eugene, Ore. 97402.

Nine-Function Card IBM-Micro-Compatible

SHERMAN OAKS, Calif. — Advanced Data Technology has announced a nine-function card that is reportedly compatible with the IBM Personal Computer.

Packaged in one of the Personal Computer expansion slots, the Series 1000 card includes seven hardware and two software features, according to the vendor. These features include 64K- to 256K-byte socketed dynamic memory with parity, serial I/O port, parallel I/O port, clock calendar with battery backup, game port, a controller, interface, print spooler and a random-access memory disk. Software is included for board diagnostics and setting of the IBM internal clock calendar.

The Series 1000 multifunction card is priced at $595 with 64K-byte memory, the vendor said from 13600 Ventura Blvd., Sherman Oaks, Calif. 91423.

CPU Targets Accounting

(Continued from Page 79)

the vendor.

The runtime environment reportedly controls the operation of Unidata 3000's hardware. It automatically attends to keyboard data entry, validation and editing, visual display management and formatting of report data.

Unidata 3000's hardware includes a desk-top keyboard and CRT, a unit containing the computer and memory and a choice of either a letter-quality or a draft-quality printer. Besides the Z80 chip, the computer module contains a real-time clock, 128K bytes of resident memory, two on-line floppy disk drives with a combined capacity of 2.5M bytes and two communications ports.

The system is available for $10,000 without a printer. Unidata can be reached through P.O. Box 701, Portsmouth, N.H. 03801.

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Sturdy PDP-11-Based System Out

OAKLAND, Calif. — Trilobyte Computer Corp. has announced a ruggedized version of Digital Equipment Corp. PDP-11/LSI-11 Winchester-based computer systems for field use.

Trilobyte II reportedly provides cooling and protection from dust, shock and vibration, making it possible to use commercial Unibus/Q-bus processors, memories and disks in adverse environments.

Pricing for the Trilobyte II starts at $26,294. The vendor is located at 780 W. Grand Ave., Oakland, Calif. 94612.

Disk Subsystem Released

LA GRANGE PARK, Ill. — BC Systems, Inc. has announced a high-capacity removable disk subsystem that combines Winchester disk reliability with floppy disk removability for the IBM Personal Computer, Victor Business Products, Inc. Victor 9000 microcomputer and S-100-based systems.

The Frigid Disk Subsystem boasts 20M bytes of memory.

Pricing starts at $6,750, the vendor said from 1016 E. 31st St., La Grange Park, Ill. 60525.

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Printers Out For Micros

EL SEGUNDO, Calif. — Xerox Corp. has announced two 40 char./sec bidirectional daisywheel printers for microcomputers, word processors and small business systems.

Called the Xerox 1730-320 and 1730-340, the units feature serial and parallel interfaces and operate with either plastic or metal daisywheel print elements, according to the vendor.

The 1730-320 reportedly costs $2,395 and the 1730-340 costs $2,995.

A dual-tray cut sheet feeder costs $1,995, the vendor said from 800 Apollo St., El Segundo, Calif. 90245.

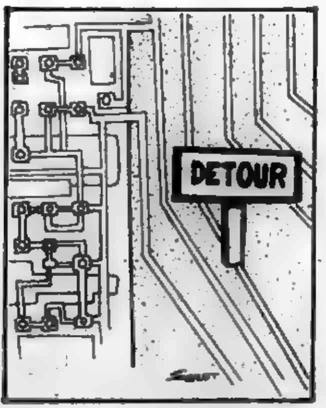
Ramplus Fits IBM Micro

SAN DIEGO — Raytronics, Inc. has announced a memory board that adds 1M byte of memory to the IBM Personal Computer.

Called Ramplus, the unit's memory banks are designed to accept either 64K- or 256K random-access memory chips. The vendor noted that users electing to use 64K chips can replace them with 256K chips when they become available.

The board contains a parity error detection logic capability that can be abled or disabled with a dip switch. Other functions include serial port, parallel port and clock/calendar with battery backup.

Memory boards cost from $575, the vendor said from 4901 Morena Blvd., Building 900, San Diego, Calif. 92117.



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For Televideo's 925, 950

Add-In Graphics Board Out

SACRAMENTO, Calif. — Selenar Graphics Corp. has announced the SG-900, an add-in graphics board for Televideo Systems, Inc.'s 925 and 950 terminals.

The SG-900 board is reportedly field-installable and uses a standard Televideo communications interface. Features of the SG-900 include emulation of Tektronix, Inc. 4010 and 4014 graphics terminals, including a 660-by-250 dot resolution on an 8-in. by 5-in. screen, a 4,096-by-4,096 pixel addressable plot area, vector variation, full-page break, point plot and incremental plots, reported a spokesman for the vendor.

The SG-900 costs $1,095, the spokesman said. Selenar Graphics is located at 4212 N. Freeway Blvd., Sacramento, Calif. 95834.

Printer Boasts 1,000 Line/Min

MALDEN, Mass. — A high-speed band printer that operates at speeds up to 1,000 line/min. with a 64-char. band has been unveiled here by Data Printer Corp.

The Model 3101 is equipped with acoustically buffered cabinetry, caster, spool-to-spool ribbon, rear control panel and extensive diagnostics, according to the vendor. Optional features include forms length selector switch, formal load, paper puller, elapsed time meter and a digital line counter.

The printer is available at under $11,000. Further details are available from Data Printer, headquartered at 99 Middlesex St., Malden, Mass. 02148.

Interface Board Features Z80A

SANTEE, Calif. — A floppy disk interface board has been introduced by Greco Systems, Inc.

The Z2800 is said to feature a Zilog, Inc. Z80A processor with 2K bytes of random-access memory (RAM) and 4K bytes of read-only memory (ROM), a floppy disk port and an RS-232C port. It is supplied with firmware to duplicate the Digital Equipment Corp. TU-58 cassette drive protocol and a jumper-selectable executive program so users can develop their own custom interface, the vendor reported.

The Z2800's memory is expandable up to 40K bytes of RAM/ROM and a second RS-232C port is also available. The basic unit costs $195 from Greco Systems at Suite A15, 10020 Prospect Ave., Santee, Calif. 92071.

Recount 4 Out For Accounting

MOORESTOWN, N.J. — The latest version of Danyl Corp.'s expense management system for copiers, data terminals, facsimile machines and other office equipment has been unveiled.

Recount 4 reportedly allows in-house data processing and provides account validation with alphanumeric entry capability. The system records data on a diskette that contains valid account tables. Users can choose between 5¼-in. or 8-in. diskettes that are compatible with a range of systems, a spokesman for the vendor explained.

The basic Recount 4 system, which includes a single terminal, is priced at $6,000. Further details are available from Danyl at 1509 Glen Ave., Moorestown, N.J. 08057.

Sola Introduces Volt Regulators

ELK GROVE VILLAGE, Ill. — Two models of a line voltage regulator from Sola Electric, Inc. will accommodate higher voltage loads, reportedly eliminating the need for wiring smaller units together in parallel at installation sites where a higher regulated power is required.

The units are available in 10-kVA and 15-kVA sizes in two series. Transformers in the Constant Voltage Transformer Series are recommended for ac applications in which harmonics can affect operation. The 10-kVA version costs $3,926 and the 15-kVA unit costs $4,828, a vendor spokesman reported.

For ac applications in which noise attenuation is required, the Micro/Minicomputer Regulator Series is said to protect precision electronic equipment from all line power irregularities except total line failure, the spokesman said. The 10-kVA version costs $4,114 and the 15-kVA unit costs $5,060.

More information on the products is available from Sola Electric, located at 1717 Busse Road, Elk Grove Village, Ill. 60007.

Micro Users Get Sweet-P Plotter For Graphics

SAN DIEGO — A graphics plotter for microcomputers, including software and interface hardware, has been unveiled by Enter Computer, Inc.

The Sweet-P Personal Plotter provides users with colorful pie charts, graphs, illustrations and various other business graphics, according to the vendor.

This product is priced at $795. More information is available from Enter Computer, located at 6867 Nancy Ridge Drive, San Diego, Calif. 92121.

'Hey, You There — Human!'

Univac Puts Off Delivery Of 1190 Series to March '84

BLUE BELL, Pa. — Sperry Univac has announced that deliveries of its 1190 series of mainframe systems has been pushed back to March 1984, nine months later than the June 1983 expected date.

Shipments of the large systems will reportedly be stepped up through the second and third quarters of 1984, with volume shipments beginning in August of next year.

The vendor is blaming the shipment delays partially on the "1190 not meeting the standards set by the company" and also on a strong early customer response to the system's introduction, a spokesman said.

"The strong early response to the Sperry 1190 system has exceeded expectations. We expect continued market acceptance with no impact upon our order backlog as a result of the schedule change," according to a Sperry spokesman.

Board-Level Processor Out

EMERYVILLE, Calif. — SBE, Inc. has announced the Modulas Ten M68k10, a board-level processor that is compatible with Intel Corp.'s Multibus and IEEE-P796 standards.

The circuit board is equipped with a Motorola, Inc. 68000 microprocessor, 256K bytes of random-access memory, support for Intel's multimodule and multiprotocol serial communications and parallel control, according to a spokesman for the vendor.

The unit costs $1,995, the vendor said from 4700 San Pablo Ave., Emeryville, Calif. 94608.

Peac System Gets Graphics

SOUTHBOROUGH, Mass. — Decision Graphics, Inc. has announced a graphics work station for the firm's Peac computer-aided design/drafting system.

Called the Peac 4100, the unit provides the same basic capabilities as the firm's 7200 workstation, but is less expensive and reportedly more flexible.

Software includes general two-dimensional graphics, schematic planning, digitized existing drawings, inventory bill of materials, the Peac data base, symbol libraries and general plotting, a spokesman for the vendor said.

The Peac 4100 workstation costs from $6,400. Software modules cost from $3,000, the vendor said from 11 Main St., P.O. Box 306, Southborough, Mass. 01772.

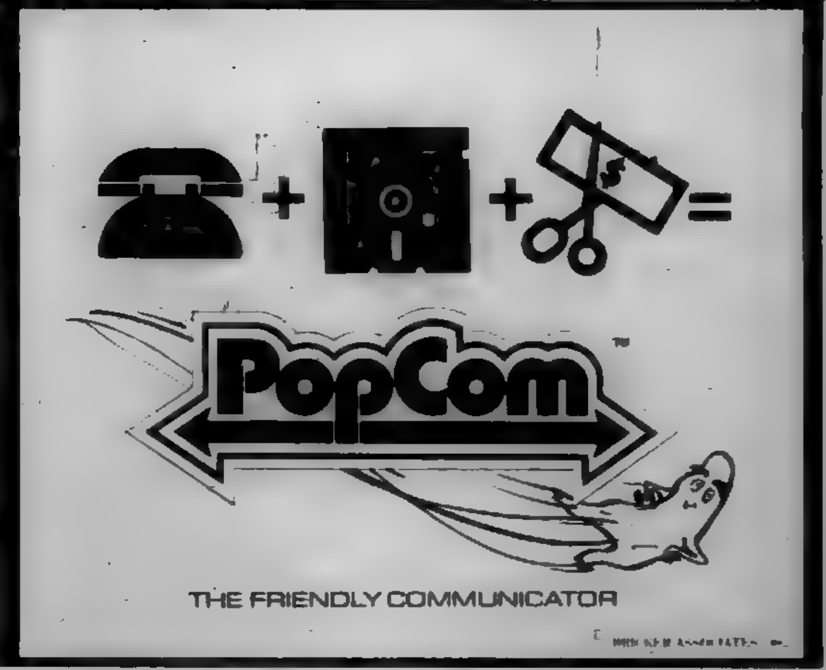
Format Aid Out For Typereader

MANCHESTER, N.H. — Hendrix Technologies, Inc. has enhanced its Typereader page reader with an interface that provides it with more formatting capabilities.

Compatible with Wang Laboratories, Inc.'s VS series of computers, the Deluxe Interface reportedly improves formatting of columnar and indented text and data, which are read by the Typereader for automatic input to the Wang VS. There will be no extra charge and no special hardware needed for this feature, the vendor added.

The revised product costs $9,995 until April 30, after which it will cost $14,995.

The vendor is located at 670 N. Commercial St., Manchester, N.H. 03101.



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Fits Nova, Eclipse, MV Series

Board Connects DG Minis to Ethernet

WESTFORD, Mass. — Interlan, Inc. has introduced a controller board said to be the first to connect Data General Corp. minicomputers to the Xerox Corp. Ethernet local-area network.

The NI4010A Data General Ethernet/IEEE-802 CSMA/CD (carrier-sense multiple access with collision detection) Communications Controller is said to be an intelligent controller board that contains the data communications logic required for interfacing DG's Nova, Eclipse and 32-bit Eclipse/MV minicomputers to Ethernet.

The controller also complies with the new IEEE-802.3 standard and European Computer Manufacturers Association 80/81/82 technical specifications for 10M bit/sec CSMA/CD local-area networks, a vendor spokesman claimed. When attached to the Interlan NT10 transceiver unit, the NI4010A controller performs the specified CSMA/CD local network data link and physical channel functions that support communications by stations at 10M bit/sec over distances up to 2,500 meters on a shared coaxial cable, the spokesman added.

On transmission, the NI4010A formats frames and performs the CSMA/CD transmit link management functions of collision detection, back-off timing and retransmission as required to successfully deliver frames onto the network. When not transmitting, the NI4010A continuously listens to the network for frame traffic intended for it. Only frames with a matching address are accepted by the controller for subsequent transfer to the DG host system, a spokesman claimed.

Address Recognition

The controller performs physical, multicast group and broadcast address recognition. It can reportedly store up to 13.5K bytes of received frames.

By minimizing the possibility of dropping incoming frames, a DG system with the NI4010A can engage in high-bandwidth virtual-circuit communications with other stations on the network. For transmit buffering, the NI4010A has a 1.5K-byte transmit buffer from which all frame retransmissions are made when transmit collisions occur.

All data block transfers between the NI4010A and system memory are under the control of an on-board data channel controller. This data transfer technique is said to provide high data transfer rates between the host DG minicomputer and other stations on the local network.

The controller will be available in April for $2,490 from Interlan, 3 Lyberty Way, Westford, Mass. 01886.

File Aid, Clusters Debut From Syntrex

NEW YORK — Syntrex, Inc. has unveiled a series of clustered word processors and electronic file software.

The Center Series Clusters is composed of multiple clustered word processing systems and designed for high-volume word processing centers.

It features the 16-bit Intel Corp. 8086-based Aquarius Plus workstation and 384K bytes of internal memory and a text editor that reportedly makes input and revisions of large, complex formatted documents simple.

It also features automatic paragraph and line numbering, automatic index generation, automatic table of contents and automatic footnote numbering and alignment. Other features include pagination with multiple headers and footers with window and orphan control, background printing with print queueing and a queue manager, multiple window editors, simultaneous edit, print pagination and filing options.

A spokesman said footnote references are automatically moved with their reference, page endings realigned, outlines created and pages printed automatically and simultaneously.

(Continued on Page 93)

WP Saturn Update Fits VAX, PDP-11s

MINNEAPOLIS — Saturn Systems has introduced Version 4.2 of WP Saturn, a word and list processing package for the Digital Equipment Corp. PDP-11 and VAX computers operating under DEC's RT-11, TSX-Plus, RSX, RSTS or VMS.

Features of the package include a range of editing and formatting commands and full documentation, a spokesman said. DEC VT100 screen-scrolling capability has been built into the system so that the window can be moved up or down with the cursor keys.

The list processing package has been improved to provide quicker access to files and easier definition of search and replace values. The sort and select program now allows for the specification of a range of values when creating output files.

The word and list packages can be purchased separately or together. Prices start at $489. Saturn Systems can be reached at 6875 Washington Ave., Minneapolis, Minn. 55435.

Data Base, Graphics Packages Announced for Wang Micro

LOWELL, Mass. — Wang Laboratories, Inc. has introduced two software packages for its Professional Computer microcomputer — a data base package and a business graphics package.

The Professional Computer Data Base is said to allow the user to create, sort, query and gather information prior to output. The data reportedly can then be merged into either Wang's Multiplan spreadsheet or a word processing document. This package will be available in the spring for $650.

Wang's Professional Computer Business Graphics software is said to allow the user to utilize statistical information in business graph form. It allows the user to create bar, line and pie charts and produce hard-copy output on a variety of peripherals, a vendor spokesman said. The graphics package will also be available in the spring and is priced at $300.

Wang Laboratories is located at One Industrial Ave., Lowell, Mass. 01851.

All-In-One Guaranteed

MAYNARD, Mass. — Digital Equipment Corp. has announced a money-back guarantee on its VAX-based All-In-One office automation computer systems.

The Satisfaction Guaranteed program allows a customer to return any All-In-One system within 120 days after delivery for a full refund of hardware purchase price and software license fee, the vendor explained.

Further details may be obtained from DEC headquarters, Maynard, Mass. 01754.

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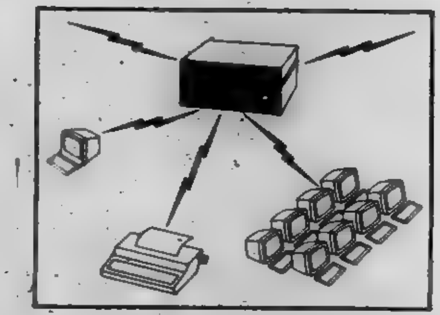

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Freeform DBMS Debuts

GRAND PRAIRIE, Texas — Dimension Software Systems, Inc. has unveiled Personal Computer/Data Base Management, said to be a complete shared-network and relational data base management system for IBM Personal Computers and Digital Equipment Corp. Rainbow 100 personal computers and VAX-11 superminicomputers.

Freeform, the operating system software, was designed to bring mainframe capabilities to smaller computers on a shared, high-performance data base machine. It will provide over 60 users with features such as screen formatting and report and application program generation. Also, users reportedly can perform complex operations and create custom applications without programmer assistance, according to a spokesman for the vendor.

Planned future additions to Freeform include an electronic mail function, a Basic language interface, a runtime-accessible library of application programs, local-area networking and shared peripherals, the spokesman added.

The price for the entire package ranges from $700 to $950 per personal computer. Prices vary depending upon configuration, the spokesman said. Further information can be obtained from Dimension Software Systems, located at 605 E. Safari Drive, Grand Prairie, Texas 75050.

Entry System Scans Optically

BRECKSVILLE, Ohio — Eeco Information Systems has introduced an automatic document-entry system said to read optically typewritten documents into NBI, Inc. word processing equipment.

The Dest Workless Station optical character reader can enter a page of information into a word processor in 25 seconds with one mistake per 300,000 characters, a vendor spokesman said. It can copy up to 140 pages per hour. The operator loads the pages into a tray and the characters are entered and scanned unattended, the spokesman added.

The optical reader is available for between $10,000 and $15,000 from Eeco Information Systems, a division of Electronic Engineering Co., 6896 West Snowville, Brecksville, Ohio 44141.

'WP/1' Version Out for Series/1

SAN JOSE, Calif. — Systar Corp. has introduced an enhancement of its office automation software for the IBM Series/1 running under IBM's EDX operating system.

Version 4 of WP/1 is said to feature a text editor, an on-line Help facility, a spelling checker, enhanced text-formatting capabilities and support for additional correspondence-quality printers. The editing facility now supports block-mode IBM 4978 and 3101 terminals.

The enhanced version of the software is available for a one-time license fee of $2,500. Further details can be obtained from Systar, located at Suite 208, 1762 Technology Drive, San Jose, Calif. 95110.

Docman Runs On Decsystem

BURLINGTON, Vt. — A relational document management system for users of Digital Equipment Corp. Decsystem-20s running under DEC's Tops-20 has been introduced by Results, Inc.

Docman is said to feature flexible data structures and to accommodate hierarchical, network, circular or custom-designed structures. Documents reportedly can be displayed, edited, deleted, merged, copied, renamed, printed, encrypted and transferred to a different document base, a vendor spokesman said.

A single-system license costs $1,750. More information is available from Results, located at 217 S. Union St., Burlington, Vt. 05401.

Word Processors, File Aid Bow

(Continued from Page 91)

The Center Series is said to ensure correct document formatting, regardless of changes.

A typical small cluster with two workstations sharing a printer is priced at $19,000. Each station can operate independently while sharing access to the attached printer. Individual documents can be queued as created and priority jobs can interrupt lesser tasks.

A typical medium-size cluster with four workstations sharing a 10M-byte disk and two printers costs $40,000. With it document segments can be input or edited by several operators, then joined with a single command to form a final document.

A typical large system featuring nine workstations, 30M bytes of redundant storage, the Electronic File Room software package, application and list processing is priced at approximately $100,000. With this system, manual procedures typically required to track documents in the center are eliminated.

The Electronic File Room can reportedly find anything in an organization's electronic file, typically in less than 30 seconds, even if its location is unknown.

The package automatically builds an index to every document in the electronic file by every word used in each document.

The package searches across any level of the electronic file hierarchy (folders, drawers, cabinets and so on) and even across several rooms linked together by a local-area network. It also provides for searches based on criteria not contained in the text of the document, such as author, typist, date, subject, abstract or category.

The package costs $3,900 from Syntrex at 246 Industrial Way W., Eatontown, N.J. 07724.

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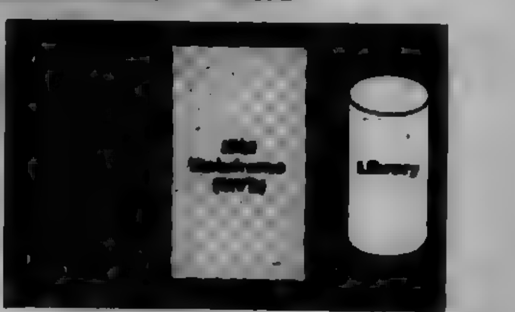

It used to be that storing documents on the mainframe was no easy task for Wang word processors. Literal transmission of characters was accomplished, but document format and administrative information was lost.

Soft-Switch™ has changed all that.

Soft-Switch is a distributed software product developed by Integrated Technologies, Inc. to expand the capabilities of document routing and archiving. With Soft-Switch, Wang OIS, VS and WPS word processors can now archive documents on the mainframe—totally intact, down to the number of key strokes—and index them as you like (e.g. keyword, author, date). These documents can then be transmitted to other Wang stations, or even IBM or NBI stations, using ITI's extensive edit level translation capabilities. This is done using Soft-Switch's store-and-forward mode—utilizing an IBM (or compatible) mainframe with the MVS operating system. This means that no communication is necessary between the WP operators—the recipient receives the document directly from the mainframe. And only one routing instruction is necessary, regardless of the number of destinations—within one office, across the country, or around the world.

For more information about Soft-Switch, call or write.

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108

Olsen Enthusiastic Over DEC's Vision Of Personal Micros

CW File Photo

Kenneth Olsen

By Bill Laberis
CW Staff

BOSTON — With daily production of 500 units per day, soon to rise to 1,000 units per day, Digital Equipment Corp. is "still very enthusiastic about [its] personal computer.

"But, we've got to be a little cautious we don't wipe out all the others with our enthusiasm," DEC President Kenneth Olsen said, as a reminder that the company remains, first and foremost, a minicomputer maker.

Speaking before the Boston Society of Security Analysts recently, Olsen told the 200 luncheon guests that DEC's personal computer offerings represent only one of three primary growth markets the company will target in the near term. The other two high-growth areas — superminicomputers and large disk drives — will continue to comprise the computing backbone of big business, DEC's traditional meat and potatoes market, Olsen indicated.

"Personal computers are different from business computers, and we have to keep that message straight," Olsen told the stockbrokers. "Personal computers are im-

(Continued on Page 100)

Opinions Differ Sharply On IBM Lease Marketing

By Bill Laberis
CW Staff

Is IBM Credit Corp. poised to pull out the stops and assert itself more aggressively than ever in the lease market?

Based on recent activity in the financial markets and on the analysis of some industry observers, the answer might be yes.

But third-party dealers contacted last week say the Credit Corp. has shown no significantly increased market aggressiveness in recent months, nor is it likely to in the near future.

What is known is that Merrill Lynch & Co., Inc., with whom the Credit Corp. allied for funding last summer, has taken on a new partner, Metropolitan Life Insurance Co. According to one analyst, Metropolitan has committed "many, many millions" to the Credit Corp. in the last month via the Greenwich Liberty 1983 Limited Partnership, the name given to the Metropolitan, Merrill Lynch and Credit Corp. partnership. Also, the Credit Corp. recently issued $100 million in medium-term bonds via a public sale.

One lease market analyst, Charles Greco of International Data Corp. of Framingham, Mass., said Merrill Lynch originally committed $150 million last summer and, up until a couple of months ago, was concerned over the reportedly slow activity of the Credit Corp. IBM would not comment on Greco's figures.

But now, Greco said, the $150 million has been "totally used up," and Merrill Lynch and Metropolitan have jointly committed a sum "in excess of $150 million — way in excess of $150 million," to finance Credit Corp. leases.

"They are moving now in a very big way," Greco said. "The leasing community might not be aware of these recent developments, because some of them are not necessarily public."

(Continued on Page 102)

DG Draws a Bead On 32-Bit Market

By Ed Scannell
CW Staff

Data General Corp.'s latest leap in the game of technological leapfrog it has been playing with Digital Equipment Corp. over the last three years has once again put the perennial number two maker of minicomputers back into serious contention in the 32-bit market.

Analysis

With the introduction of its Eclipse MV/10000 two weeks ago, DG President Edson de Castro claimed the company's Eclipse line of computers represents "the most extensive array of 32-bit systems found anywhere."

According to Whetstone single-preci-

(Continued on Page 104)

And Free Enterprise

Reagan Seen Supporting R&D

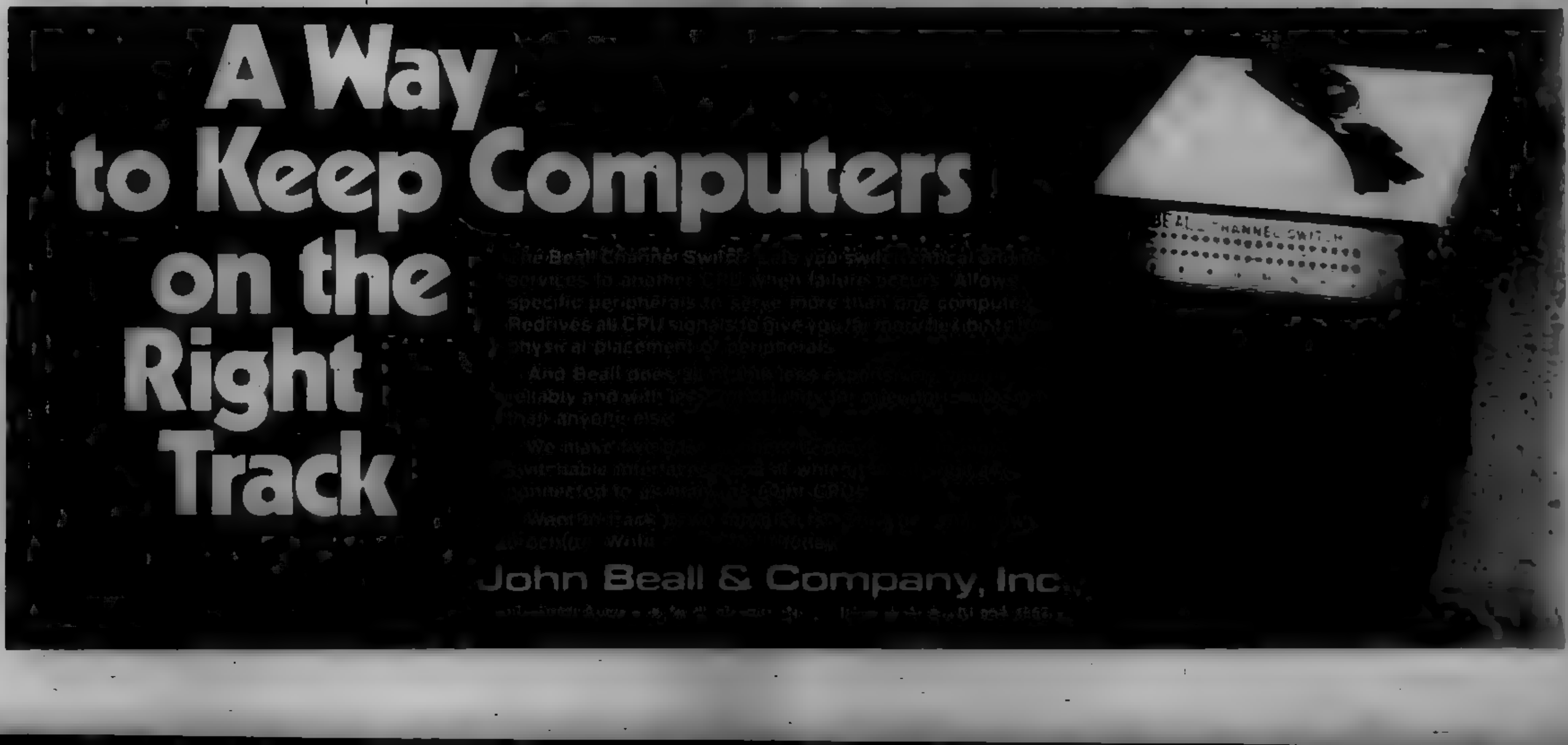
By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — President Reagan's recently proposed budgetary increases for supporting research and development reflect a long-term commitment to R&D in this country, particularly computer sciences and engineering, according to administration science officials.

"The message has gotten across that there are substantial problems in engineering and computer sciences [support]," according to Jack T. Sanderson, assistant National Science Foundation (NSF) director for engineering. Sustained growth in NSF funding for these items can be expected for the next few years, he told a recent Institute of Electrical and Electronics Engineers (IEEE) briefing on the federal R&D budget.

NSF budget increases for fiscal 1984 would be 17.8% overall, according to the Reagan proposal [CW, Feb. 7], which Sanderson said would permit the foundation to raise total research grants by 18.4%.

(Continued on Page 102)



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Three Firms Join Forces To Develop Net Standard

IRVINE, Calif. — Western Digital Corp., 3M Interactive Systems and Allen-Bradley have announced a joint effort to develop a broadband token-bus local-area network, which the companies intend to use as an industry standard.

The network reportedly will be based on the recently announced IEEE 802 specification, suited to the special requirements of industrial automation.

The 802 specification is incorporated in the General Motors Corp. manufacturing automation protocol system program, designed to provide common interfacing between a variety of data manipulating and control devices.

Allan Edwin, general manager of 3M Interactive Systems, said his company will introduce a low-cost, high-performance office local-area network in May.

Shaw Forms New Enterprise

SAN DIEGO — Peter J. Shaw, who resigned recently as president of Megatek Corp., has formed a new company that will produce microcomputer-based information processing systems.

Shaw, 36, said he has formed Syte Information Technology, Inc. here, along with former associates from Megatek and an engineering team.

While declining to talk specifically about Syte's products, Shaw issued a prepared statement maintaining that Syte's operations will not be in conflict with Megatek's products or marketing activities.

Former Megatek associates who have joined the Shaw venture include Bruce Hamilton, former vice-president of engineering.

Olsen Pleased With Micros

(Continued from Page 99)

portant to a business. But for running a business, it's a completely different game."

Reports of both software and hardware problems with DEC's top-line personal computer, the Professional, have surfaced in recent months. DEC has repeatedly denied any major production or software glitches in its personal computer lines, although Olsen alluded to potential problem areas in both hardware and software.

On the manufacturing side, Olsen said several unforeseen problems can crop up when production moves "from zero to 1,000 units per day."

Nevertheless, Olsen expressed confidence that DEC's production schedule for personal computers would be close to company projections for 1983 of about 100,000 units, but did not refer to actual shipment projections.

Regarding the selection of operating software for the Professional, DEC recently announced the availability of an optional card that will allow the Professional to run under Digital Research, Inc.'s CP/M 80 operating software. When announced, the Professional featured DEC's own Professional Operating System (P/OS), a subset of the company's RSX operating system.

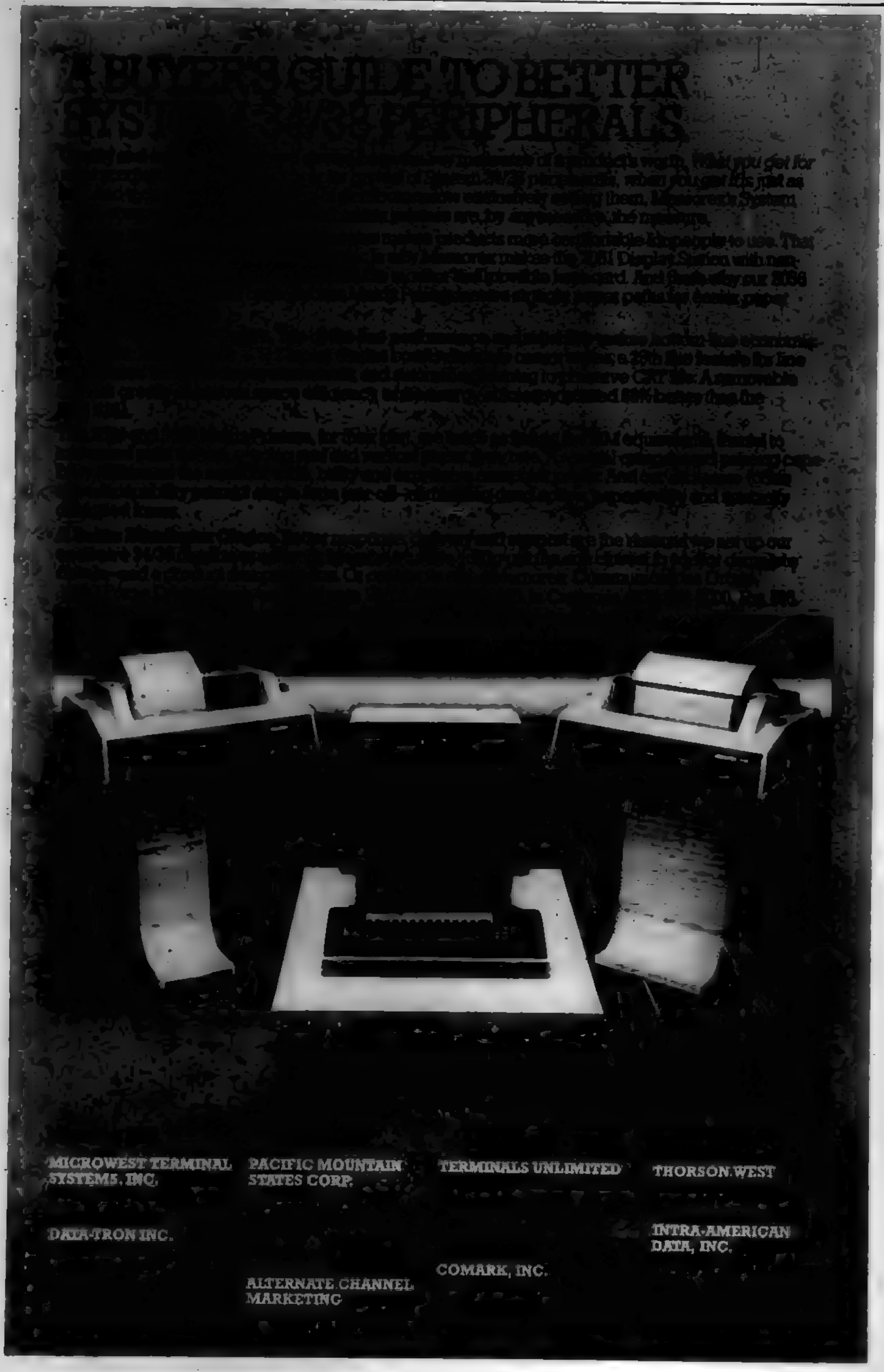
Users now are more attracted to DEC's low-end personal computer, called Rainbow, than to the Professional, largely because Rainbow features CP/M, for which several application packages have been written and tested. Independent software houses have reportedly been slow in tailoring application packages to DEC's operating system for the Professional (CW, Jan. 24).

Shifting gears, Olsen said DEC's intention to support Bell Laboratories Unix operating system on DEC's VAX superminicomputers has proven a source of "tremendous turmoil internally," as DEC's in-house software development team feels its own operating software is far superior to the more generically popular Unix. As the internal debate continues, Olsen said he is inclined to offer both Unix- and VAX-like operating software. "And I'm winning," he quipped.

Olsen said further that DEC is busy expanding the VAX family with a "much larger, faster VAX" that is "still a year or two away" and is pressing ahead with development of a VAX on a chip with which the company will produce what Olsen called "the ultimate personal computer."

Ironically, as he spoke, Data General Corp. was unveiling a top-line superminicomputer, said to be 50% more powerful than DEC's biggest VAX, the 11/780 (see story Page 99).

Commenting on that announcement, Olsen said, "We never look over our shoulder" at Data General.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Reagan Seen Bolstering Commitment to R&D

(Continued from Page 99)

Commenting on these increases, Dr. James Ling, senior policy analyst with the White House Office of Science and Technology Policy, said the budget proposal reflects "a clearly articulated science policy" of the administration and is not a one-year spike in funding levels.

But Ling also told the IEEE meeting the administration will continue to adhere to a conservative R&D support policy, which emphasizes getting the most for its limited resources and financing only those research projects considered vital to the U.S. and which would not be undertaken by the private sector.

"The emphasis today really needs to be not on expansion [of R&D capabilities and facilities] but [on] how do we get more out of what we already have," Ling said, arguing for "quality not quantity."

Ling noted that the 1960s and 1970s saw "a massive infusion of federal funds" into university research and he suggested that the White House would like to see a return to greater reliance on private-sector support.

Asked if the growing government support for R&D in competing countries, especially Japan, does not challenge the government to increase its R&D funding even more, the senior policy analyst responded that the Reagan administration wants to preserve the free enterprise, entrepreneurial character of American science and technology.

"It's clear, the administration doesn't want to turn the U.S. into another Japan," Ling said.

Opinions Vary On IBM Policy

(Continued from Page 99)

Greco said the $150 million he claims Merrill Lynch committed last summer represents only the leveraged portion of leases written.

With the funds generated both internally and through Greenwich Liberty, Greco said the Credit Corp. "could write from $500 million to $1 billion" in leases in 1983, placing the Credit Corp. in the top three computer leasing companies.

The third-party dealers disagreed with Greco's analysis — and sharply so.

George Heilborn, president of IPS Computer Marketing Corp. and former president of the Computer Dealers and Lessors Association (CDLA), said IBM has not exhibited a significant increase in lease market aggressiveness in recent months.

Heilborn added that some analysts have "made too much" of Credit Corp.'s presence in the lease market.

Further, Heilborn said the majority of the Credit Corp.'s business is in funding the so-called Installment Purchase Agreements (IPA) and not the Term Lease Agreements (TLA) that compete directly in the third-party lease market. IPA are typically 48-month agreements by which IBM customers purchase equipment in installments, as opposed to the TLA, which are strictly lease-based.

Kenneth Pontikes, another CDLA member and president and chairman of Comdisco, Inc., said he has sensed "no great change" in the Credit Corp.'s lease activities in recent months.

In an interview last November, Pontikes said the Credit Corp. is a significant, but not dominant force in the lease market.

Regarding the $100 million the Credit Corp. is raising with its recent bond issue, Pontikes said, "The Credit Corp. is like any other finance company. It needs that kind of money to handle its regular operations. It's really no big thing."

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Industry Execs Lobbying For Rewrite of Export Act

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Computer and electronics industry representatives gathered in force on Capitol Hill recently to begin their push for streamlined export controls as Congress intensified efforts to rewrite the soon-to-expire Export Administration Act.

The industry executives told a Senate banking subcommittee March 2 that high-technology firms support export controls that deny unfriendly nations militarily useful technology and products as long as enforcement of those controls does not interfere with trade between the U.S. and its allies. The spokesmen suggested a number of changes to the existing export law that they said would accomplish that goal.

In several hearings already completed, federal agency officials, particularly from the U.S. Commerce Department, which has the prime role in administering the 1979 export control act, have assured Senate and House of Representatives subcommittees that the government has solved many of the licensing problems that have caused uncertainty and lengthy delays for U.S. exporters.

High-technology companies, however, clearly are not convinced the situation has improved; they maintain that overly broad export controls and time-consuming licensing procedures have made U.S. firms unreliable suppliers to customers in friendly nations.

The purpose of the export controls is to deny militarily useful high technology to adversary nations, particularly the Soviet Union. The main complaint of the electronics industries is that the controls cover too many types of technology to be practical and effective, do not take into account the availability of many controlled items from foreign suppliers and include technologies and end products that are not state of the art.

"We have always accepted the necessity for an export licensing system that meets U.S. national security needs," J.A. DeRose, IBM program director of public affairs and chairman of the Semiconductor Industry Association (SIA) export control subcommittee, told the Senate Banking Subcommittee on International Finance and Monetary Policy. But, he said, "we are deeply concerned that excessive controls may be imposed . . . which would seriously hinder the ability of U.S. firms to compete internationally."

The export control philosophy suggested by DeRose and representatives of the Computer and Business Equipment Manufacturers Association (Cbema), the Electronics Industry Association and the American Electronics Association emphasizes enforcement of controls, agreed to multilaterally by the U.S. and its allies, on goods that might reach the Soviet Union and other unfriendly countries, while at the same time seeking relaxed controls on trade with friendly nations.

Summing up his association's position, Cbema President Vico Henriques said: "National security export controls can only be effective if our country's enforcement efforts concentrate on products and technical data that are truly militarily critical, if multilateral controls focus on East-West trade in items that are not available outside the U.S. and through voluntary compliance and cooperation between the U.S. government and U.S. exporters."

Henriques and DeRose urged Congress to establish a new "comprehensive operations license" — a two-year renewable license for an individual company's exports of critical technologies to Western and other friendly nations. As described by SIA, the new license would in effect be government approval of a firm's own export control practices.

"Exporters would submit an application with a broad description of the items involved, a description of the company's internal control system, copies of the operating agreements with its network of foreign consignees and supporting statements from the consignees," DeRose told the subcommittee.

Henriques pushed the comprehensive operations license concept by arguing that "any new government controls must recognize existing commercial safeguards governing the treatment of . . . technology if they are to be effective. By creating a comprehensive licensing mechanism for technology, these proprietary systems can become the foundation for controlling the transfer of technology."

Customs Head Addresses Delays

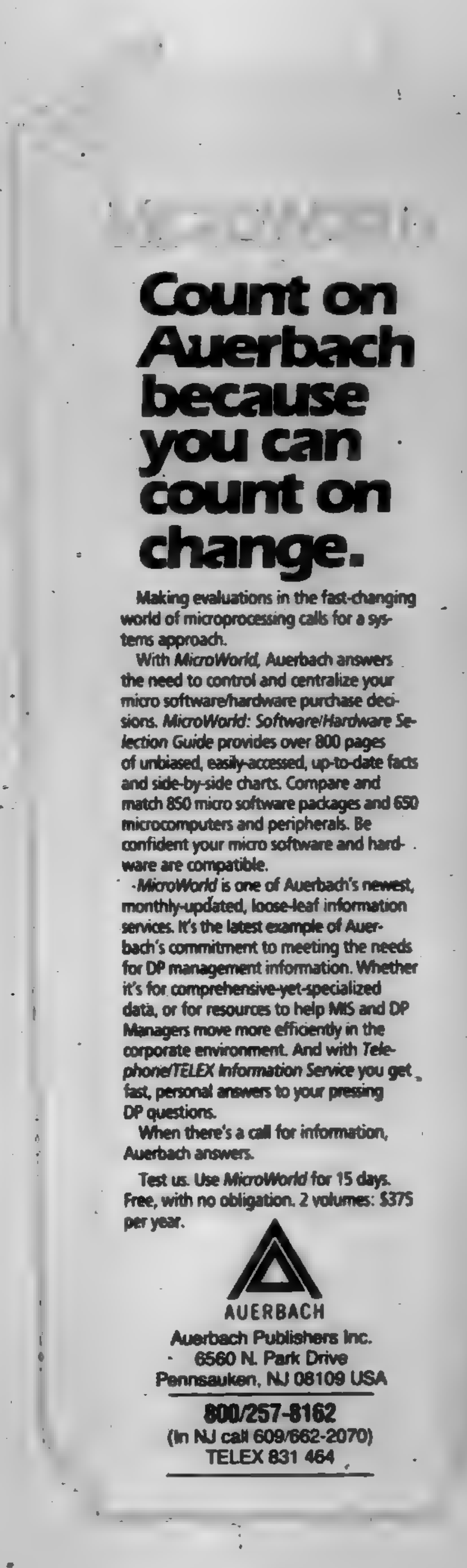
By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The head of the U.S. Customs Service has promised a quick end to the delays its export control enforcement efforts, designated Operation Exodus, have caused U.S. exporters. The shipment seizures and delays have infuriated high-technology companies.

Appearing before a joint hearing of two House trade subcommittees March 1, Customs Commissioner William von Raab said his agency has been very successful in reducing the illegal flow of U.S. technology abroad "with minimal effects on the export community in this country." The hearings were part of congressional efforts to redraft the 1979 Export Administration Act, which expires in September [CW, Feb. 14].

A number of electronics firms, particularly small ones unable to weather financially the long delays in completing export deals, have taken the Customs Service to task for Operation Exodus, describing Customs agents as untutored goon squads with dangerous weapons. A congressional assessment of the Customs Service's operations will be critical to the export act rewrite because some legislative proposals would transfer all export law enforcement

(Continued on Page 104)



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Customs Head Promises End to Export Delays

(Continued from Page 103)

authority to the Customs Service. Some authority now resides with the Commerce Department, which the industry generally finds more amenable to the needs of exporters.

Commissioner von Raab told the subcommittees the first phase of Operation Exodus, which concentrated on outbound cargoes, "has resulted in increased compliance with the nation's export laws."

Exporters are now more aware of their responsibility, particularly under the Export Administration Act, and though a few export shipments have been delayed as a result of this program, these delays should diminish substantially in the near future, he said.

The Customs Service continues to educate its inspectors to better recognize particular exports that might violate the law.

The Service will introduce minicomputers in the field in the near future so that inspectors can immediately determine the licensing status of a commodity, von Raab added.

To date, von Raab said, Operation Exodus has resulted in 2,481 detained shipments, out of 9.9 million total shipments.

Of those detained, 765, valued at approximately $55 million, were seized, von Raab noted.

The planned second phase of Operation Exodus, according to von Raab, will focus on investigations and intelligence.

A third phase will be to rely more heavily on foreign Customs Service offices to investigate violations of U.S. export laws, particularly violations involving diversion of controlled items from intended recipients to unfriendly nations, according to von Raab.

TI Endures $50 Million Ill

DALLAS — Texas Instruments, Inc. said transformer problems on its 99/44A home computer will cost the firm about $50 million in 1983.

TI, which halted production of the 99/44A on Feb. 17, said pretax earnings for the firm will be down nearly $50 million with the heaviest impact coming in the first quarter.

The lower revenue is expected from loss of sales on the 99/44A along with loss of sales on peripherals.

TI stopped selling the home computer when it discovered transformer problems could give users electrical shocks or cause damage to the hardware, a spokesman said.

DG Sets Sights on Top Spot in 32-Bit Market

(Continued from Page 99)

sion benchmarks, the MV/10000 has twice the processing power of DG's previous high-end model, the MV/8000, while costing only 15% more. The benchmarks also show the system is twice as fast as DEC's high-end supermini, the VAX-11/780, a machine considered by some industry observers to be the de facto standard among 32-bit scientific machines.

"Not only will the general purpose system be competing against the VAX-11/780 for a larger slice of the scientific market, but it will also be competing against Wang Laboratories, Inc.'s minicomputers for a share of the office automation market.

"What is interesting about this announcement is the way DG is going after the office automation market as well as the scientific market with this machine," notes Venture Development Corp. analyst Tim McMahon.

McMahon contends that, with the exception of Wang, no other superminicomputer manufacturer has gone after the office automation market as aggressively as DG has with its MV series. "It is quite a reasonable strategy if they can retain some of their current [scientific] customers and at the same time get into new application areas [such as office automation] that are growing quicker than scientific and computational applications. It appears to be a good move," McMahon asserted.

Peter Lowber, senior market analyst for The Yankee Group, agrees with McMahon that the MV/10000 will have an impact on the market and that DG is doing the right thing by demonstrating a strong commitment to the office automation market.

Analysis

"Obviously, this machine sets a new performance level and is priced only 15% higher than the original MV/8000 price," Lowber contended. "I think what a lot of these vendors have to do is get into the commercial market through office automation. That is the strategy of both DEC and DG," he added.

While he thinks the Comprehensive Electronic Office (CEO) package — DG's office automation software — is better than DEC's All-In-One office package, Lowber thinks DEC has a better chance at succeeding in the office automation market because of its superior distribution resources and the availability of its microcomputers.

"They [DG] don't have any retail or distribution strategy and they don't have a microcomputer yet. You might be able to generate a VAX sale through someone that bought a DEC personal computer through a retail outlet," Lowber said. "It's nice and dandy to have a huge MV/10000, which is going to help DG's superminicomputer reputation, but what are they going to do about distribution?"

Lowber also felt that the MV/10000's pricetag of $211,000 makes it too big a risk even for the Fortune 1000 companies. "The Fortune 1000 companies aren't going to go off and invest that kind of money in a high-end system until they know that system meets their needs and works. In a lot of ways the MV/4000 [priced at $8,000 with CEO] should open up doors more quickly than the MV/10000," Lowber stated.

There is no indication DEC will counterpunch DG's MV/10000 announcement by introducing a follow-up to its VAX-11/780. The minicomputer leader seems more content these days to concentrate its efforts on its microcomputers and putting the VAX on a chip.

"And they are absolutely right to do that," Lowber said in commenting on DEC's efforts to put the VAX on a chip. "You want to have a professional workstation that is the jack of all trades: it would be a terminal, a local or personal data base machine, a local applications processor but it would have access to data bases elsewhere including SNA [IBM's Systems Network Architecture] support. Here is where Data General has to pay attention," he concluded.

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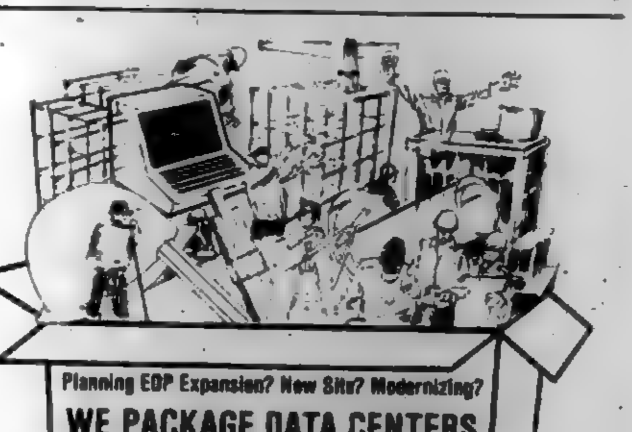

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To Spur High Tech Worldwide

Investment Venture Firm Off to Flying Start

By Bill Laberis
CW Staff

NEW YORK — A new investment venture spearheaded by Merrill Lynch & Co., Inc. and designed to spur high-technology companies throughout the world is apparently off to a flying start.

The Sci/Tech Holdings Co., formed last month, has reportedly raised in the neighborhood of $550 million in its first week of subscriptions, far in excess of the $200 million the company is said to have sought over a 30-day period.

Although Sci/Tech must abide by Securities and Exchange Commission rules and keep the subscriptions open through the end of this month, company management is "reorganizing paperwork" regarding further subscriptions to the high-tech superfund, a spokesman said.

Management responsibilities for the fund will be handled internationally by Merrill Lynch Asset Management, Inc., Nomura Capital Management, Inc. of Tokyo and Lombard Odier International Portfolio Management Ltd. of London. In order to provide expertise in seeking viable investment, Sci/Tech has established a nine-member advisory council comprised of scientists from the U.S., Japan and Europe, Sci/Tech said.

A Merrill Lynch spokesman declined to say just how much has been committed to the company's investment bank or how much the company intended to raise via the current subscription drive.

But two sources close to Sci/Tech said the amount raised to date has greatly exceeded original expectations.

In a prepared statement, Sci/Tech said, "The international investment management of Sci/Tech gives it the flexibility to commit assets anywhere in the world where the mix of technological advances and a favorable investment climate seem likely to serve the fund's long-term objectives."

Investment opportunities likely to be investigated by Sci/Tech include computers, particularly microcomputers; robotics; communications; and factory and office automation, the company said.

"Based on current geographic concentrations of such companies, the fund will initially focus its investments primarily in companies operating in the U.S. and Japan and, to a lesser extent, in Western Europe," according to Arthur Zeikel, president of Merrill Lynch Asset Management and director of Sci/Tech. "The long-term goal, however, is to build a well-diversified stock portfolio that also represents science and technology firms in Southeast Asia, South America or wherever else oportunities exist," he said.

Firms Join Device-Driver Program

WILSONVILLE, Ore. — Graphic Software Systems, Inc. (GSS) and Digital Research, Inc. announced that 11 graphics peripherals manufacturers have agreed to participate in their joint device-driver development program. Device drivers are specialized software programs that allow interaction between a computer and a graphics peripheral.

Under the development program, GSS or Digital Research personnel will create and test the device driver for a participating vendor, then make it available to existing and new customers of GSS and Digital software.

The 11 firms include Control Systems, Inc., Digital Engineering, Inc., Epson Computers, Inc., Hewlett-Packard Co., Houston Instruments Corp., Integral Data Systems Corp., Okidata Corp., Orchid Technology Corp., Plantronics/Frederick Electronics Corp., Printronix, Inc. and Strobe, Inc.

Market Costs Survey Focus

ARLINGTON, Va. — The Association of Data Processing Service Organizations, Inc. (Adapso) has published a computer services industry expense and operating ratios survey, including profit margins, liquid and current ratios, working capital turnover and debt ratios at the corporate level.

One hundred companies participated in the survey, with the data provided representing results from 1981 to early 1982.

Included in the survey findings were the following:

- The software products segment of the industry generated a median revenue per employee of $79,000.
- The professional services segment produced median profit margins of 11%.
- The median computer hardware cost for the integrated systems segment was 49% of revenues.
- The median computer systems costs, as a percent of revenues for the processing services segment, was 16%.

For information on receiving copies of the survey, contact Adapso, Suite 300, 1300 N. 17 St., Arlington, Va. 22209.

AT&T to Raise $1 Billion By Offering New Shares

NEW YORK — AT&T last week announced plans to raise about $1 billion by offering a yet unspecified number of new shares of common stock. It is the second $1 billion equity offering AT&T has made since early December.

AT&T says it will not disclose the number of new shares to be offered until the firm registers the new offering with the Securities and Exchange Commission (SEC). Industry watchers, however, estimate the latest AT&T issue will be in the neighborhood of 15 million shares. A spokesman said registration with the SEC will occur in the very near future.

Registration will probably occur within the next week, and ATT said it expects its latest offering to be the only public offering this year. An AT&T spokesman said proceeds from the latest offering will be used for general purposes.

In early December, AT&T raised $1.062 billion from 17.7 million shares. The underwriter for that Dec. 2 offering was the Wall Street firm of Morgan Stanley & Co. Some industry watchers speculate that Morgan Stanley will underwrite the current offering as well.

Correction

The headline on Page 68 of the Feb. 28 issue should have been "CSC Goes to Trial May 16 on Overbilling Charges." The bribery charges were lodged against five former and present Computer Sciences Corp. employees, not the corporation itself.

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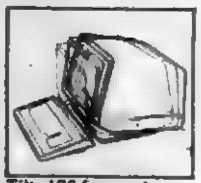

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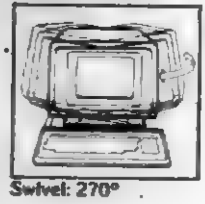

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Oki Electronics of America, Inc., Ft. Lauderdale, Fla., and **Standard Telephone Co.**, South Hackensack, N.J., have signed a marketing and distribution agreement giving Standard Telephone exclusive distribution rights in most of the Northeast U.S. to Oki's Spectrum 700 and 4000 digital switching systems.

Fairfield Industries, Inc. and **Continental Telecom, Inc.** will acquire **Western Union, Inc.'s** interest in **Space Communications Co.**, the Maryland-based firm that will operate and manage the Tracking and Data Relay Satellite System for the National Aeronautics and Space Administration.

Aydin Corp. has received awards totalling $4.2 million from **Communications Satellite Corp.** for satellite link-up hardware.

Computerland Corp. will distribute **Lotus Development Corp.'s** Lotus 1-2-3 software through its network of retail stores under terms of a recently signed agreement.

TRW, Inc. has selected **Computer Development, Inc.'s** Executive Telecommunication System 3000 and related software to be implemented into the TRW office automation program.

Siecor Corp. has been chosen by **Digital Equipment Corp.** to supply cables for its first fiber-optic network product, the DYX02 Decdataway optical interface. Siecor will also provide engineering and installation services to assist Decdataway users.

Digilog Business Systems, Inc. has selected **Intel Corp.'s** IAPX 186 16-bit microprocessor and **Digital Research, Inc.'s** CP/M-86 operating system for its next generation of desktop business computers.

Digital Equipment Corp. has added Basis-OA, an electronic library retrieval system, to its department office system, All-In-1, under terms of a joint marketing agreement signed with **Battelle Memorial Institute's Columbus (Ohio) Laboratories.**

Codata Systems Corp., Sunnyvale, Calif., will supply **Interactive Images, Inc.**, Woburn, Mass., with an undisclosed number of **Motorola, Inc.** 68000/**Bell Laboratories'** Unix-based CTW-300 microcomputer systems under a recently signed $1.5 million contract.

Vista Computer Co. has signed a two-year agreement with **Amlyn Corp.** of San Jose, Calif., to purchase more than $5 million of Amlyn's multidisk floppy disk drives.

Honeywell, Inc. has been awarded a $50.9 million contract by the **Air Force Computer Acquisition Center** to provide a Honeywell ADPS, Model DPS 8/70 and support services for the Advanced Personnel Data System managed by the Air Force Manpower and Personnel Center, Randolph Air Force Base, Texas.

Intel Corp. has signed a contract with **Zentec Corp.** for the purchase of customized versions of Zentec's Cobra terminal system.

Micro Peripherals, Inc. has been awarded a $5.5 million contract by **Direct, Inc.** to supply 5¼-in. flexible disk drives for a desktop intelligent multiple-purpose workstation.

Amnet, Inc. has been awarded an additional $1.4 million contract from the Swedish Defense Materiel Administration for an advanced packet-switching data communications network. The firm has been awarded over $3 million to date for the installation of the X.25-based private data network.

Computervision Corp., Bedford, Mass., has received a $1 million order for computer-aided design and manufacturing equipment from **Atari, Inc.**, a subsidiary of Warner Communications, Inc.

Computer Input Services, Inc., Upper Darby, Pa., has received orders from the American Cancer Society, Toys R Us, the Service Station Dealers of America and the National Association of Retail Dealers for its data entry and credit card processing services.

Hewlett-Packard Co. has signed a contract to purchase Ethernet local-area network communications products from **Ungermann-Bass, Inc.** HP will use the products in its HP 9000 series of 32-bit computers.

General Electric Co. is providing factory-authorized leasing, sales and service for **Racal-Vadic, Inc.'s** VA4400 series of quad modems.

Plexus Computers, Inc., Santa Clara, Calif., has signed a $2 million agreement to supply **Southwest Modular Systems, Inc.** with P/35, P/60, P/25 and P/40 multiuser microcomputers operating under Bell Laboratories' Unix System III.

Western Union's Field Service Division will provide exclusive on-site installation and service for **Transaction Processing, Inc.'s** 3600 and Diplomat point-of-sale computers.

Altos Computer Systems, Inc. has signed a $1.2 million agreement to supply its Altos 586 16-bit microcomputer to **3Com Corp.**, Mountain View, Calif. 3Com will use the microcomputers as "network servers" that will allow IBM Personal Computers to be linked into a Xerox Corp. Ethernet network.

Priam Corp. has signed a two-year, $3.1 million contract with **Cado Systems Corp.** to supply the firm with an undisclosed number of 14-in. Winchester disk drives.

CIE Systems, Inc. has signed two OEM contracts totaling $4.7 million for its CIES 680 single- and multiuser systems with Grand American, Inc., El Toro, Calif., and Computerway, Inc., Zurich, Switzerland.

Buying Binge Over

M/A-Com Hiking R&D Outlays

By Paul Gillin
CW Staff

BOSTON — Earnings at M/A-Com, Inc. will be lower in 1983 than in the depressed year of 1982. However, the company is continuing to pour money into research and development in anticipation of a 1984 rebound.

That was the message from Richard T. DiBona, president and chief executive officer (CEO) of the Burlington, Mass.-based manufacturer of telecommunications equipment, at the annual shareholders meeting held here earlier this month.

DiBona said M/A-Com is settling down to digest its new acquisitions following a buying binge that continued from 1978 until early this year. "New acquisitions, if any, will be made on a highly selective basis," he said.

Acquisition and divestiture activity continued through the first two quarters of fiscal 1983, DiBona noted. In the last four months, M/A-Com has sold the Ohio Scientific computer company and the Prodelin, Inc. antenna and cable company. It also dropped interests in the Cylix Communications Network and Valtec Corp., a fiber-optic cable company. Further, the company became sole owner of Local Digital Distribution Co., a supplier of digital telecommunications equipment.

Economy Blamed

DiBona blamed "adverse economic conditions" for a slump that caused M/A-Com earnings to fall 3% to $41.3 million in 1982. The slide continued in the first quarter of 1983, with income dropping 38% from the same period last year.

But the CEO sought to allay investors' fears by restating the company's goal, "to become the leading worldwide telecommunications corporation during this decade." He said he was recommending a one cent increase in the quarterly dividend to five cents per share.

DiBona announced that M/A-Com has reached an agreement in principle to supply hardware to General Instruments Corp. for a $600 million direct broadcast satellite contract award, which that company recently received from Universal Subscription Television, Inc. M/A-Com also announced recently a $28 million contract for digital satellite communications equipment from Southern Pacific Communications Co.

DiBona said M/A-Com expects to benefit from the breakup of AT&T into seven operating holding companies next year. Petitions filed by regional Bell operating companies to build DTS have specified M/A-Com Equipment, he said.

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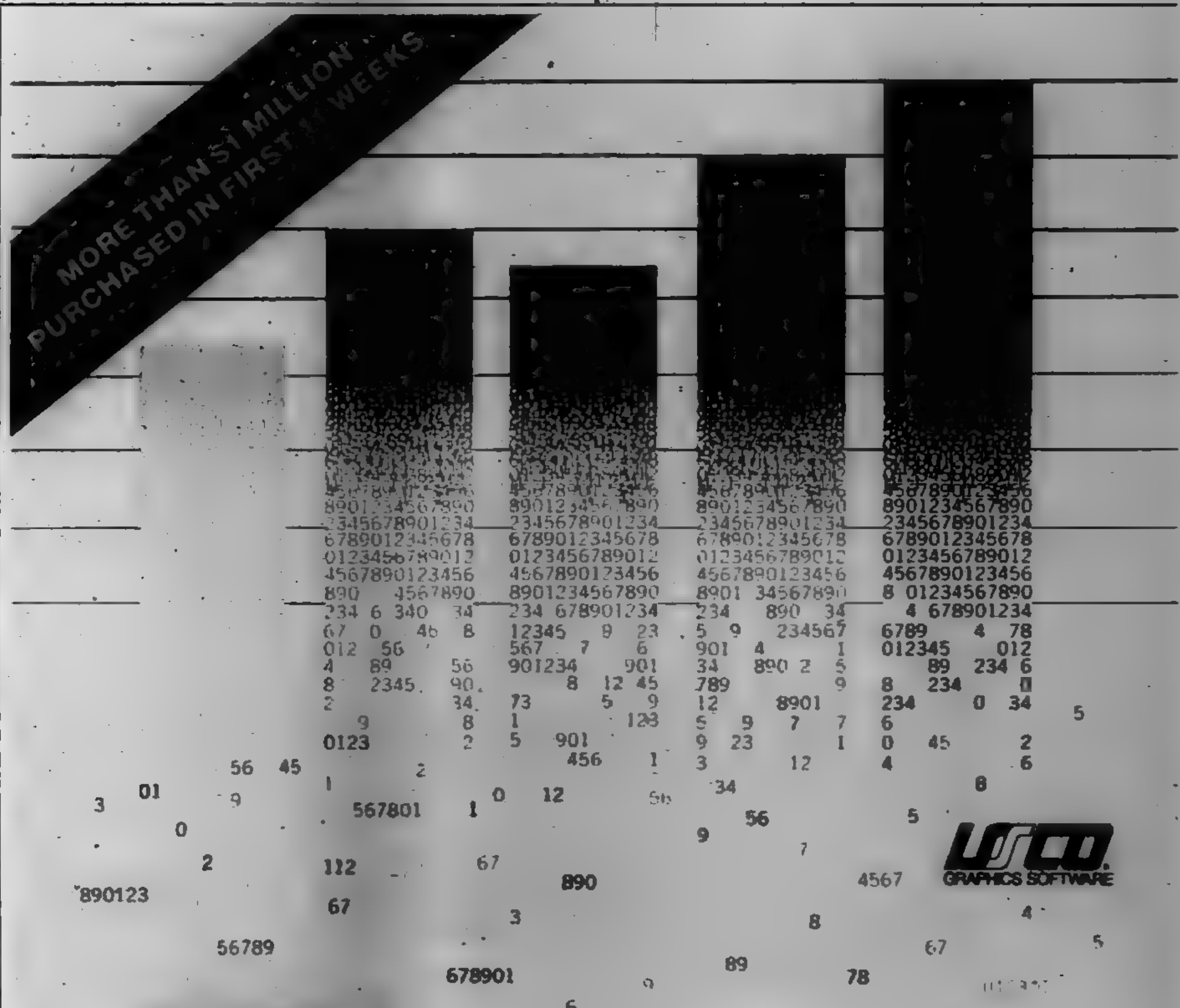
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Nickels & Dimes

The board of directors of **Wang Laboratories, Inc.** has voted to increase the quarterly dividend on class B common stock from 2 cents to 25 cents per share and the class C quarterly dividend from 75 cents to $1.25 per share, payable May 2, 1983.

$ $ $

Apollo Computer, Inc. has filed a registration statement with the Securities and Exchange Commission covering a public offering of 3 million shares of common stock, 2 million to be sold by the company and 1 million by certain shareholders.

$ $ $

Seven venture capital firms and two private investors have provided **Telmos, Inc.** with $3.6 million in capital funding. Investors included Banque Darier Et Cie, Switzerland; New Enterprise Associates, San Francisco; Ventech Partners L.P., New York; Montgomery Securities, San Francisco; Montgomery Ventures, Cupertino, Calif.; Abingworth Management, Ltd., London; and Interven SA, Luxembourg. E. Kleiner and Dr. J. Last (Fairchild founders) provided private funds.

$ $ $

Northern Telecom, Inc.'s board of directors has declared a first quarter 1983 dividend of 30 cents per share of common stock, a 20% increase over the amount paid per share each quarter in 1982.

$ $ $

Bridge Communications, Inc. has raised $4 million in its second round of venture capital funding. Investors included Weiss, Peck and Greer-Lawrence; Merrill, Pickard, Anderson and Eyre; E.M. Warburg, Pincus and Co.; Interwest Partners; Matrix Partners; Institutional Venture Partners; and Citicorp Venture Capital.

$ $ $

Walker Interactive Products, Inc. has received a total of $4.8 million in venture capital funding from Alden & Co.; Kleiner, Perkins, Caufield & Byers; and Technology Venture Investors.

$ $ $

Drivetec, Inc. has secured $3 million in equity funding. The leading investor was Hambro International Venture Fund, New York. Also participating were Advanced Technology Ventures, Menlo Park, Calif., and Bay Partners, Mountain View, Calif.

$ $ $

Emulex Corp. has announced a 97% increase in revenues and a 128% increase in net earnings for the second quarter, 1983, over the same quarter last year. Earnings per share were up from 22 cents per share to 40 cents per share over the same period.

$ $ $

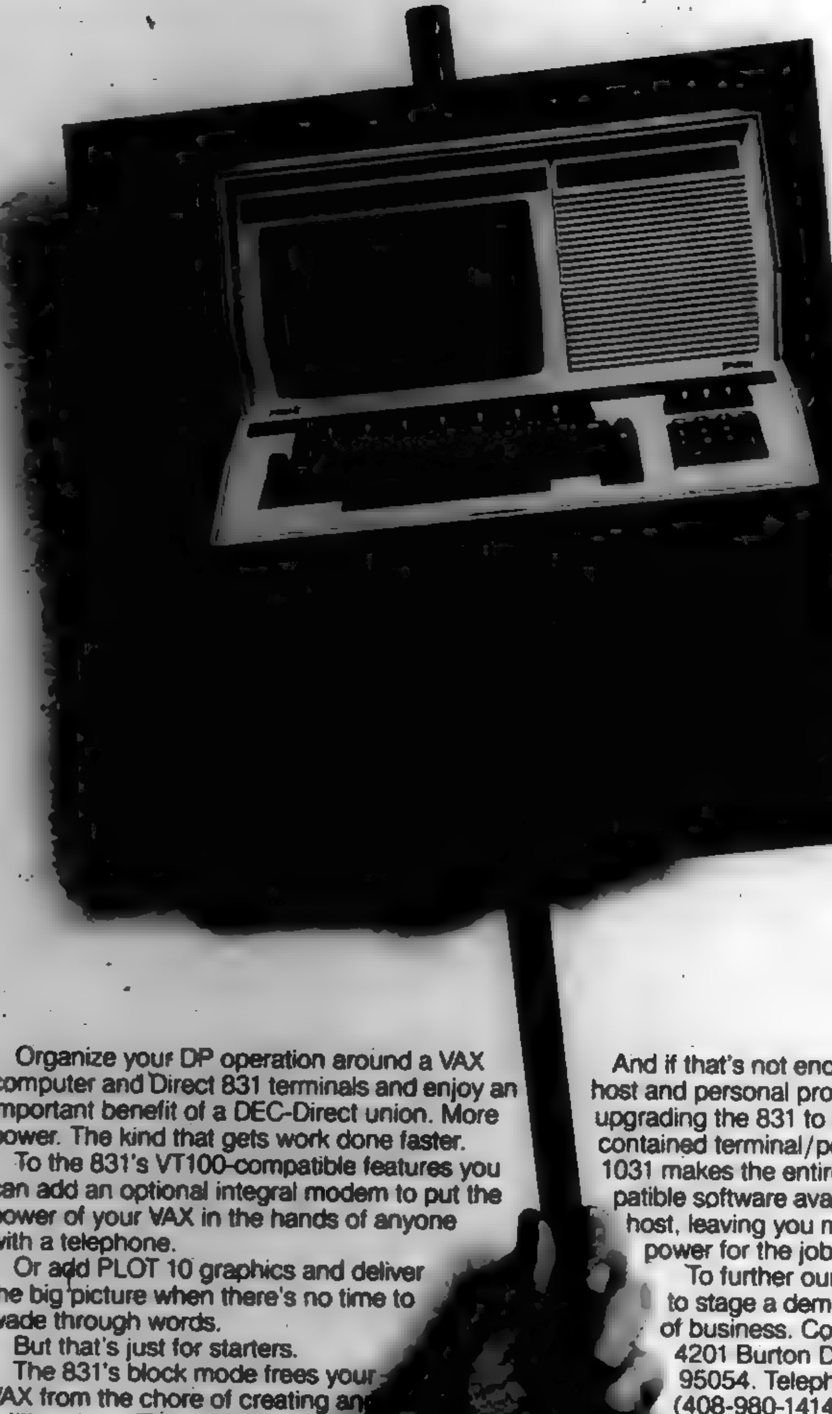
Camex, Inc. has completed $6.2 million in financing through the sale of common stock and a $2 million unsecured three-year revolving credit line from the First National Bank of Boston.

$ $ $

The board of directors of **Emulex Corp.** has authorized a two-for-one split of its common stock, effective Feb. [illegible] 1983.

$ $ $

Cullinet Software, Inc. (formerly Cullinane Database Systems, Inc.) has announced that revenues for the three months ending Jan. 31, 1983, increased 62 cents compared with the same period last year. Net income for the quarter was $3,025,000, a 51% increase over last year's $2,007,000.



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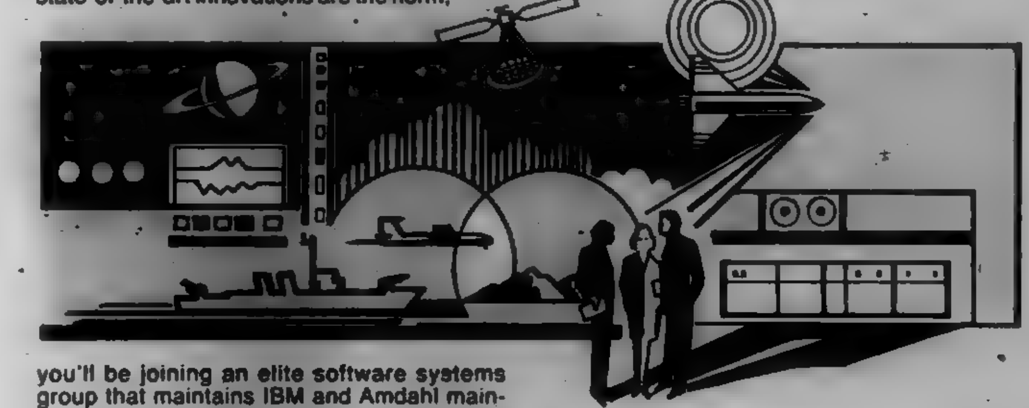

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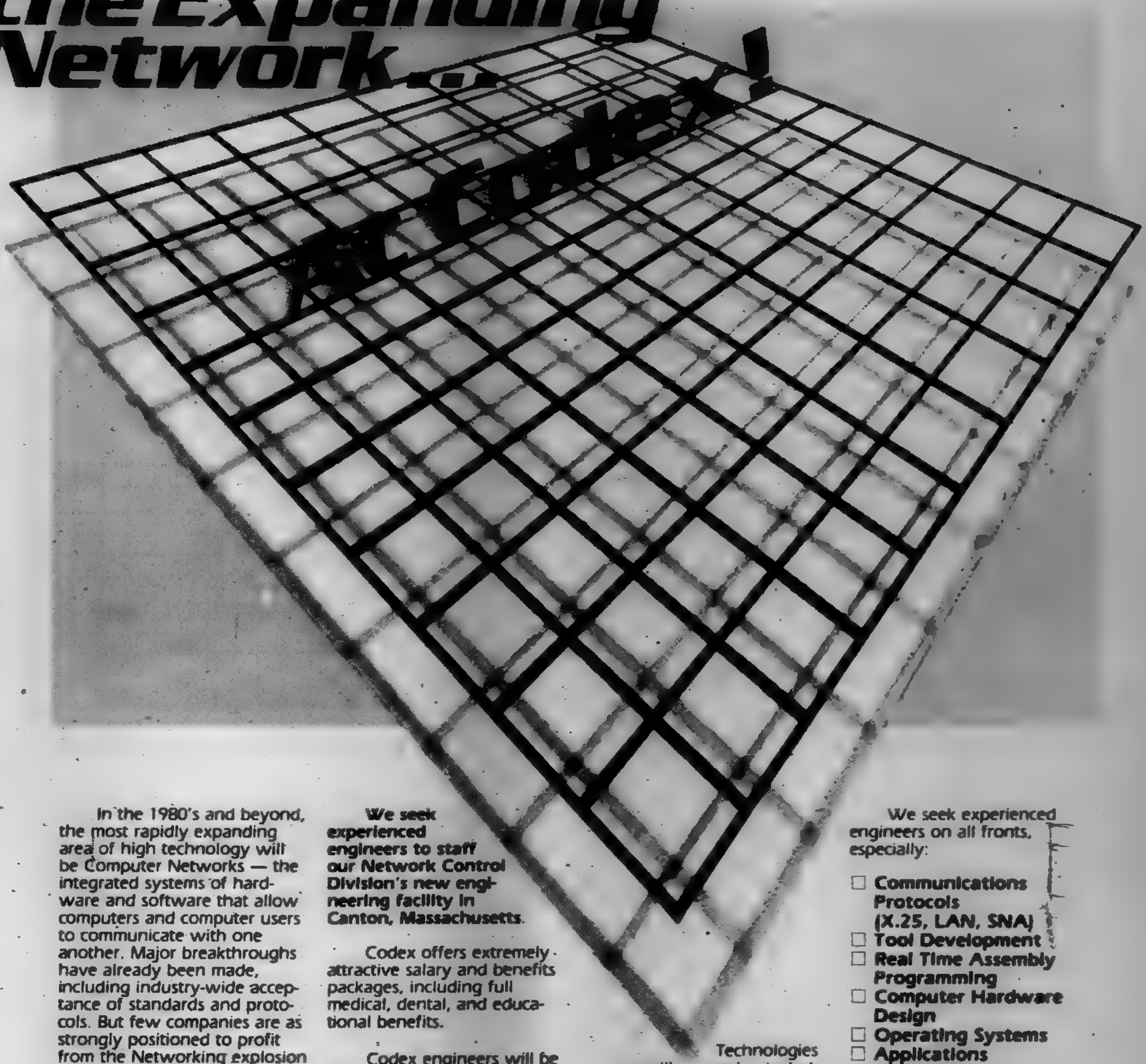

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DIRECTOR OF ADMINISTRATIVE COMPUTER CENTER

Amherst College invites you to submit your qualifications for the position of Director of Administrative Computer Center. Your primary and immediate responsibility will be the upgrading of the College's administrative computer information program. Your experience should include demonstrated ability to manage a staff of about 17 employees who perform systems, programming, operations and support functions. Knowledge of IBM 4300 series equipment, familiarity with integrated database systems and experience with word processing and teleprocessing systems is necessary. Communication skills are considered very important to the position. There is a cooperative relationship with the Administrative Computer and Academic Computer Centers of the College. An undergraduate degree is required.

Amherst College is located in Amherst, Massachusetts near the foothills of the Berkshire mountains, yet it is only about 100 miles from Boston and 125 from New York. It is part of the five college cultural area that includes UMass, Hampshire, Mount Holyoke and Smith Colleges.

If you believe you have the leadership and technical qualifications for this position please send your resume to David F. Howland, Personnel Officer, Amherst College, Amherst, Massachusetts 01002, who is coordinating the search. All inquiries will be acknowledged. The selection will be made by the Treasurer with the aid of a Search Committee.

AN AFFIRMATIVE ACTION - EQUAL OPPORTUNITY EMPLOYER

PROGRAMMER/ CHEMIST

The Upjohn Company, Kalamazoo, Michigan, a worldwide producer of pharmaceuticals, has an opening in its Drug Metabolism Research unit for a computer programmer with a strong background in chemistry and statistics. The individual filling this position will be responsible for design and development of computer programs and systems for use on a large central laboratory automation computer system. The incumbent will be involved in the management of computer files of analytical data.

Applicants must have a B.S. or M.S. degree in chemistry, physics, computer science or mathematics and should have several years' experience in programming of computers. Ability to communicate with professionals in other disciplines is essential. Knowledge of statistics and kinetics is highly desirable.

Kalamazoo is a medium-sized southwestern Michigan community with immediate access to a mix of excellent cultural, educational, and recreational pursuits, including numerous lakes and a four-season climate. Upjohn offers an excellent salary, commensurate with experience, and an outstanding benefits program.

For confidential consideration, please call from outside Michigan toll free: 1-800-253-8600, ext. 36767; or call from Michigan collect: 616-323-6767 to request a specialized employment application be sent to you immediately. Please refer to ad number 14710-B when calling.

Upjohn

An Equal Opportunity Employer M/F

CAD/CAM Systems Manager

Salary Range to $50,000

Our firm is an established, financially stable engineering company located in a highly desirable suburban community near Chicago.

We are seeking an individual who has 1-3 years of experience on INTERGRAPH or SYNERCOM Systems and a background with DEC PDP-11/750 or VAX Operating Systems.

Reporting directly to the V.P. Engineering, this individual will be responsible for the total systems function including hardware, software and personnel.

In addition to professional involvement, we can offer a salary commensurate with appropriate background, a competitive benefits package and relocation expenses. For prompt consideration, please send your resume, in strict confidence, indicating background and salary history to:

CW-84106
Computerworld
Box 880
Framingham, MA 01701

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(603) 472-8844

Fees and relocation expenses company paid.

Computer Programming Instructors

Central Ohio Technical College is searching for two Computer Programming Instructors. One position is tenure-track, the second is an anticipated one year temporary appointment. Position responsibilities include instruction, curriculum development, and student advisement. A minimum of a Bachelor's Degree is required. Master's Degree is preferred. Appropriate academic or work experience may be substituted for the Master's Degree. Hardware in use is DEC PDP 11/70, running RSTS/E.

COCT is a two year, state supported, autonomous technical college with approximately 1300 full and part-time credit students, of which 300 are computer students. The College has a three county service area and shares a 155 acre campus with the Ohio State University at Newark, a community of 50,000 people 35 miles east of Columbus, Ohio. Salary commensurate with degree(s) and experience. To insure consideration, forward a letter of application and a resume by Friday, April 8, 1983 to Personnel Coordinator, Central Ohio Technical College, University Drive, Newark, Oh 43055. COTC is an EEO/AA employer.

NEW START-UP OPPORTUNITIES

Fox-Morris specializes in the placement of all programmers and systems analysts. Our present openings are with Top Fortune 500 companies with special emphasis on NEW START-UP opportunities on a local and regional basis. For a clear understanding of our client's needs and to know your true value in todays market, call Robert Montgomery at 919/872-2940 or send resume to

FOX-MORRIS
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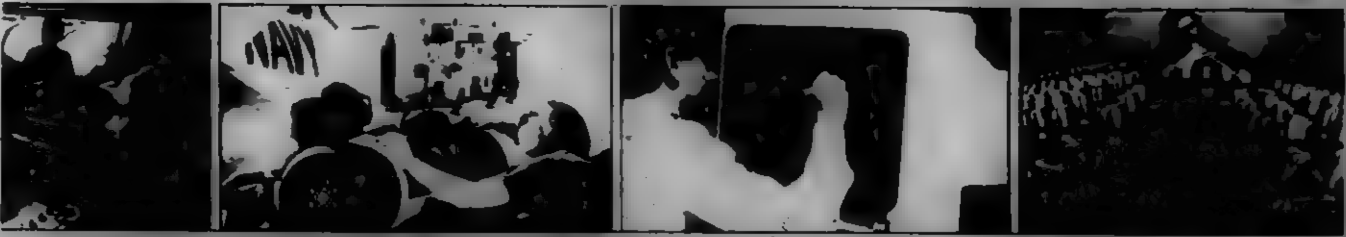
Software Development

If it's challenge and diversity you want, get it out of our systems.



One of the secrets to attracting and keeping top-level professionals challenged and satisfied is to offer broad project involvement. It works for the company and it works for the people. And that's how we work here at Sanders.

As a member of our Software Development team, you'll work on real-time, military electronic systems. On applications that range from air traffic control to signal processing. From ergonomics to jamming and direction finding systems. With future applications that include office automation and bit map graphics.

At Sanders, the spectrum of projects we have going at any given moment is positively mind-boggling.

PROJECT LEADERS

To provide technical leadership on projects involving the development of software for minicomputer and/or microprocessor based military electronic systems or computer applications systems. Will participate in Requirements Analysis and definition, system design and specification, project costing and scheduling, software implementation, and test integration. Requires BS in EE, CS, Math or Physics and 8-10 years of applicable experience.

SENIOR ANALYSTS/SYSTEMS ENGINEERS

To perform mathematical modeling, performance prediction, and algorithm development applied to Sanders' systems and devices. Particular areas include Digital Signal Processing and Sequential Estimation Techniques applied to tracking and identification applications. Duties include analysis of customer specifications and synthesis and evaluation of algorithms to meet those specifications. Customer applications include signal exploitation, air traffic control, ASW systems, training systems, and automatic test equipment. Requires BSEE/BSCS/BS Math/BS Physics and 6-10 years of experience.

SOFTWARE ENGINEERS/DESIGNERS

Microprocessor based systems applications. Experience with Intel 8080/8086 and MC68000 or other state-of-the-art micro CPU's. Practical knowledge of assembly languages as well as high level languages required. Microprocessor hardware interfacing ability a plus.

Several positions available for Software Engineers to work on microprocessor based system applications. Experience should include assembly and high level language development for the Intel 8080/8086, MC68000, and/or LSI 11/23 processors. Microprocessor hardware interfacing techniques a real plus. Applicant must have a BS degree in CS or EE, advanced degree desirable.

No question about it. We get a lot out of our systems. And you will, too.

Send your resume with salary history, specifying position of interest, to Sanders Associates, Inc., Box 153DG, 95 Canal Street, Nashua, NH 03061.

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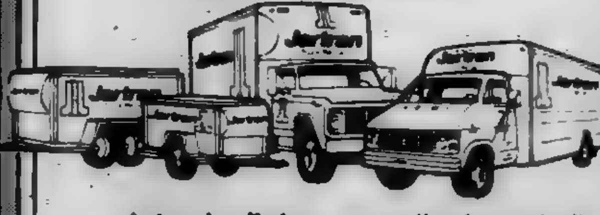
MVS SYSTEMS PROGRAMMER



Jartran is offering an exceptional opportunity for an intermediate MVS Systems Programmer to help support our technical team. If you would enjoy the exciting year-round outdoor activities that are a part of South Florida living, then consider discussing career opportunities with us.

Experience required in MVS/SP3, JES2, TSO/SPF, SMP4. Experience a plus in ACF/VTAM, ACF/NCP, UCC1, UCC3 and IMS software. Minimum 5 years experience in data processing.

IBM 3081 MVS OS/JCL VTAM IMS DB/DC JES2 TSO/SPF COBOL

Agency referrals not accepted. Submit resume to:

Valerie Friedman
MIS Department
JARTRAN, INC.
P.O. Box 343790
Coral Gables, FL 33134

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Equal Opportunity Employer, M/F.

TECHNOLOGY ANALYST

If you have been looking for an opportunity to expand your career horizon, we want to talk to you about becoming a part of a nationally recognized regional brokerage firm. Our expanding technology research and investment banking activities have created a need in our research department for an individual with a technical background and technology market segment knowledge in the areas of computers, computer services and software. This position will report to our Senior Technology Analyst and provides a concrete career path leading to full Senior Analyst responsibilities. An undergraduate engineering, math or computer sciences degree and an MBA or graduate business degree are desired, as well as solid work experience including 3 - 5 years in a consulting or corporate environment. Prior employment in a product development or marketing capacity in a technology oriented company or consulting firm is a most definite asset. We offer excellent compensation and fringe benefit package. Please send your resume in confidence with complete salary history to:

Robinson-Humphrey/American Express
3333 Peachtree Rd. Northeast
Atlanta, GA 30326
Attn.: Director of Personnel

EOE M/F/H

SOUTHERN OPPORTUNITIES

S/A FORTRAN or ASSM Mini	$28K
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Grp Mgr BANKING IBM OS	$40K
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Sys Prog OS/MVS COBOL/ASSM	$30K
Sr CICS Sys Prog DOS/VSE SNA	$35K
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MIS OS COBOL SAUDI ARABIA	Open

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(504) 525-4356

SYSTEMS ANALYST

An excellent opportunity exists for an experienced individual conducting advanced systems design and analysis projects in the field of leisure services. Assignment will be in the planning and research division of the department. Responsibilities include design of a MIS System, evaluations of physical or social/political parameters and development of support systems for field operations. Projects require experience in translation of data into written/oral presentations.

Applicants need a bachelors degree in Park and Recreation Administration, Public Administration, Resource Management, Urban Planning and/or Computer Science. Must have 5 years experience in a combination of the preceding areas. Familiarity with SAS and facility in COBOL are essentials. Small mini-computer or personal computer knowledge desirable.

Salary $25,260 - $32,280 depending upon qualifications.

Interested applicants should submit detailed resume by Friday, March 18, 1983 to:

Staffing Manager
Personnel Department
City Hall - 6A North
Dallas, Texas 75201

City of Dallas

An Equal Opportunity Employer M/F

Martin Marietta Aerospace

Data Processing Opportunities

Martin Marietta Aerospace, NASA's prime Contractor for the Space Shuttle External Tank has immediate openings for Data Processing professionals. Because we actually manufacture the external tank, you'll get to see the actual results of your efforts.

COMPUTER PROGRAMMER/ ANALYSTS

Immediate opportunities exist for individuals experienced in:

- **UNIVAC 1100**
  - **ASC11 COBOL**
  - **DMS 1100**
  - **DDL, SDDL, DMU**
  - **DML, QLP**
  - **DPS 1100, TIP**
  - **D/B Editor**
- **APPLICATION EXPERIENCE**
  - **Shop floor control, Scheduling, Manufacturing, Inventory, Purchasing, Configuration Management, Quality Engineering.**
- **DATA BASE OPENINGS**
  - **Analyst, Design, Administrators with above hardware, software and applications experience.**

These opportunities exist at our Michoud Assembly Facility located in suburban East New Orleans.

Qualified candidates interested in learning more about these opportunities at Martin Marietta should forward resumes, including salary history to Martin Marietta Aerospace, Denver Glazier, CW-314, P.O. Box 29304, New Orleans, Louisiana 70189. We are an equal opportunity employer, m/f/h.

MARTIN MARIETTA

VAX/VMS
(PROGRAMMER/SYSTEMS ANALYST)

We have acquired a state-of-the-art relational data base management system implemented in hardware as a back-end processor interfaced to a VAX/VMS host. We are looking for an individual with in-depth experience in the VAX/VMS operating system to provide technical software support services to Programmers, Systems Analysts and Operations personnel. The requirements for this position also includes a Bachelor's Degree in Business Administration, Mathematics, Accounting, Computer Sciences or related fields.

PROGRAMMER/ANALYST

These positions require a Bachelor's Degree in Business Administration, Mathematics, Engineering, Computer Sciences or related fields. Experience requirements include one year or more of business systems application programming. Heavy COBOL experience on large time sharing system is required.

EQUAL OPPORTUNITY EMPLOYER – M/F

Liberal Fringe Benefits
Must be a U.S. citizen
Replies held confidential

Send resumes to:
Trudie L. Rainey
Employment Section Chief
Reynolds Electrical & Engineering Co., Inc.
Post Office Box 14400
Las Vegas, NV 89114-4400

MIS Professionals

Our three year plan for development of a comprehensive Hospital Information System and a supporting local communication network includes substantial staff increases in Systems Development, Computer Operations, and Systems Programming. That means technical challenge, hard work, and opportunities for our current staff as well as for the Project Leaders we are now recruiting.

General Job Responsibilities
Positions include coordination of in-house personnel with software installation consultants and participation in the conversion from a service bureau to an in-house IBM environment during 1983. All positions will report to the Director, MIS.

General Requirements
IBM experience is mandatory. Previous experience in the health care industry and with the installation of packaged software is preferred. Four to six years data processing experience with a minimum of one year at a senior level.

Project Leaders
Financial Systems
Sr. Systems Analysts with financial systems experience in an on-line environment. Experience should include multiples of the following systems:

- *General Ledger*
- *Accounts Payable*
- *Fixed Assets*
- *Payroll/Personnel*
- *Patient Accounting*
- *Admissions, Discharge, Transfer*

Project Leader
Systems Programming
Sr. Systems Programmer with experience in establishing and supporting an IBM Computer Operations environment. Experience with DOS/VSE, CICS, VTAM, VSAM, tape & disk managers, job accounting, and performance tuning.

Please submit your resume and salary history to:

MMC

Metropolitan Medical Center

Personnel Department
900 South 8th Street
Minneapolis, MN 55404

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Forward inquiries to:

DASD CORPORATION
3131 South Vaughn Way
Suite 132
Aurora, CO 80014
(303) 337-0842

DASD

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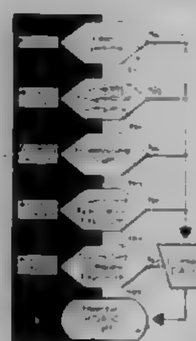

Instructor, Assistant or Associate Professor

The College of the Virgin Islands, St. Thomas Campus, is seeking an instructor, Assistant or Associate Professor of Data Processing (non-tenure track) for August 15, 1983. A Ph.D. in Information Systems, Computer Science, or related field and industry experience are desirable. Masters degree and teaching experience acceptable. Must be qualified to teach at least two of the following: COBOL and/or RPG programming, systems analysis and design, information organization and processing, operating systems, or computer hardware and communications. Assignment includes 12 teaching credit hours per semester in data processing and related business administration courses in either the associate, undergraduate or graduate degree program. Rank and salary commensurate with qualifications and experience. Send letter of application, resume, transcript and three letters of recommendation by April 15, 1983 to Ms. Magdalene Bryan, Chairperson, Business Administration Division, College of the Virgin Islands, St. Thomas, US Virgin Islands [illegible]. *An Affirmative action/equal opportunity employer.*

COMMUNICATIONS VTAM/NCP 6 MOS. PARIS

Prestigious software engineering firm has outstanding situation for the pro with strong VTAM/NCP programming. CICS a plus. Develop sophisticated video text communications networks. Spend first 6 months in Paris, and then some light domestic travel. Exceptional growth opty. Interviews immediately. $46,000 FEE PAID.

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New York, N.Y. 10036
212-221-6500 (agency)

Adams State College

Math Diagonal, Computer Science Position

Assistant Diagonal Associate Professor of Math-Diagonal Computer Science starting August 25, 1983. Teach advanced and intro computer science courses. Master's in computer science required; Doctorate required for advancement in rank. Preference to those committed to teaching excellence, familiar with the PDP-11 machine family, and having senior-graduate level course work in combinatorics or graph theory. Apply to Ron [illegible], Math Department, Adams State College, Alamosa, CO 81102. Closing date for application materials to reach ASC is May 2, 1983.

The City of Las Cruces, NM (52,387 MSA pop.) has a vacancy for Director, Management Information Services. Minimum requirements are: BSCS or related degree and (4) years as manager of an electronic data processing unit, or management analyst utilizing electronic data processing. Will head a data processing center and duplicating services section. Salary: $26,000-$31,000 per annum, D.O.E., & employee benefits. Send current resume by [illegible] March 1983 to:

Personnel Department
P.O. Drawer CLC
Las Cruces, NM 88004
An EEO/AAP Employer

Systems Programmer Consultant

4 years experience in DP, IBM mainframe OS/VSI, assembly language on-line data base 3270 financial terminal protocol in distributive processing service bureau environment. OS/MVS, DOS/VSE, CICS, JES2 (preferred), VTAM, BTAM. Job in Los Angeles. Salary is $64,480 per annum. Send this ad and your resume to job #6093, P.O. Box 865, Sacramento, CA 95804 not later than March 29, 1983.

RESULTS

Whether you're buying, selling, swapping, hiring or looking, you get results from Computerworld classifieds.

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A FUTURE WITH SOONER

Sooner Federal in Tulsa is Oklahoma's largest savings & loan. Our growth and future plans have created two outstanding career opportunities for the right candidates with banking and systems management experience.

MANAGER-Retail Banking Systems and Programming
and
MANAGER-Lending Systems and Programming

Two positions available to manage the systems and programming functions for assigned divisions including systems analysis, programming, testing implementation and user liaison. Must have 3-5 years systems experience in a $1 billion plus commercial bank, savings and loan, or mortgage banker and 1-2 years in the capacity of systems management. On-line real-time processing with DOS/VSE, CICS and DL/1 on a 370 or later computer. Degree required in Computer Science or Accounting. Both positions will report to the Senior Vice-President-Data Processing.

Retail banking position also requires experience in DDA systems and processing. Must be familiar with teller operations, accounting and MIS and CIF systems.

Lending position also requires knowledge in all areas of loan origination and loan servicing functions. Must be familiar with consumer, commercial and construction lending and secondary marketing.

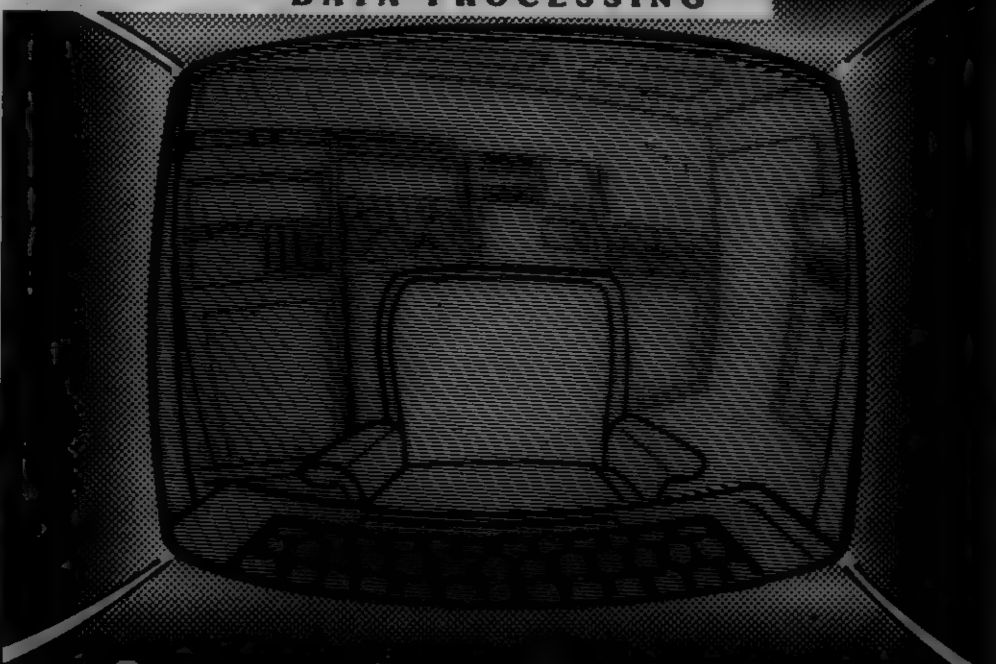
Excellent compensation and benefit package. Please send resume and salary requirements in confidence to:

Jack [illegible]
Vice-President-Personnel
SOONER FEDERAL SAVINGS AND LOAN
P.O. Box 1684
918-663-6251
Tulsa, Oklahoma 74101

SOONER FEDERAL

An Equal Opportunity Employer

DATA PROCESSING



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Human Resources [illegible]
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Snow's

Client companies have immediate needs for experienced D.P. professionals:

Operations Supervisor - 3 years NCR operations exp.

NEAT 3 Programmer- CIF, NCR.

Programmer Analyst - B.S. Computer Science, 3 years COBOL.

IBM Operator- MVS/VM/DOS VS1

Scientific Programmer-FORTRAN, CDC, DEC, B.S.C.S. degree.

COBOL Programmer-2-4 yrs exp., OS/JCL, CICS.

Contract position available now thru 1983.

All fees paid. EOE. Relocation package available. Send resume to SNOW'S RECRUITERS, [illegible], Anchorage, Alaska 99501.

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New England—Southeast—Midwest

Ground Floor Opportunity in Personal Computer Graphics

Enter Computer, Inc.—manufacturer of the exciting new Sweet-P Personal Plotter—needs three talented regional sales managers with proven skills who can motivate and sell distributors, retailers, and OEM accounts.

Position requires 4 years of related experience in personal computers or computer peripherals. Send your resume with salary requirements to Bob Sherwood, marketing vice-president, Enter Computer, Inc., 6867 Nancy Ridge Drive, San Diego, CA 92121. Tel: 619-450-0601.

SAUDI ARABIA

SYSOREX INTERNATIONAL, a California Corporation and a rapidly growing systems/management company now developing innovative multi-technology systems in Saudi Arabia, has several openings for each of the following challenging positions:

DATA BASE SPECIALISTS

B.S. degree or equivalent. 4-10 years experience in business applications. Understands data base concepts and operations in depth. Working knowledge of structured analysis, design and programming. Knowledge of large scale IBM systems and teleprocessing. Programming ability preferred (COBOL). Team contributor. Supervisory experience required for some positions. Arabic speaking ability an asset.

SYSTEMS ANALYSTS

B.S. degree or equivalent. 6 -10 years experience in business applications. Working knowledge of structured analysis and design. Familiar with large-scale IBM systems, OS/JCL, COBOL, and online applications. Team contributor. Supervisory experience in equipment configuration desirable. Arabic speaking ability an asset.

COMPUTER OPERATORS

Associate degree required. Minimum 2 years experience in telecommunications network operations. Basic knowledge of modem-to-modem telecommunications protocol and operations. Arabic speaking ability an asset.

SYSTEMS PROGRAMMERS

B.S. degree or equivalent. 3 - 10 years experience with programming, both applications and systems. Knowledge of CICS, large scale IBM operating systems, and data base management systems. Fluent in COBOL and/or Assembler. Sys. Gen. experience desirable. Knowledge of communications systems desirable. Team contributor. Supervisory experience required for some positions. Arabic speaking ability an asset.

APPLICATION PROGRAMMERS

B.S. degree or eqivalent. 4 - 10 years experience in business applications and large-scale information systems. Fluent in COBOL, IBM OS/JCL, on-line programming. Prefer data base management experience. Knowledge of structured design and programming. Work in high-pressure team environment. Supervisory experience required for some positions. Arabic speaking ability an asset.

We offer an excellent benefit package including: a medical, life, accidental death, disability and profit sharing plan. You will additionally receive 25 working days vacation, 15 holidays, free furnished housing, annual return home travel, paid relocation expenses, plus eligibility for present Federal income tax exclusions. U.S. CITIZENSHIP REQUIRED FOR ALL POSITIONS.

Please send resume, INDICATING POSITION TITLE FOR WHICH YOU ARE APPLYING, with present salary to Personnel, SINFOSSA, SYSOREX INTERNATIONAL, INC., 10590 N. Tantau Avenue, Cupertino, CA 95014. INDIVIDUALS ONLY APPLY.

SYSOREX

Sysorex International Inc.

WANT TO WORK ON THE TECHNICAL FRONTIER AND LIVE IN AN ACADEMIC VILLAGE?

Hone in on the cutting edge of nuclear science and technology at one of the largest universities in the country. Enjoy competitive salary, excellent advancement opportunity and fringe benefits (including continuing education) in a beautiful campus community adjacent to the state capitol of Michigan. The National Superconductiong Cyclotron Laboratory offers you an organization large enough to be a world leader in the study of exotic nuclear phenomena and small enough to know everyone by name. Join a team which will value and reward your ability to solve problems with minimum supervision. Sound interesting?

We're looking for positions as follows:

Programmer/Analyst: Duties are to develop and maintain software for the Laboratory's computer systems. Needs cover a broad range of functions from control of the cyclotron to complex data base management and analysis routines. Minimum qualifications include a demonstrated skill in FORTRAN and MACRO with a basic understanding of digital logic. Knowledge of Digital Equipment PDP/VAX processor desirable.

Send resumes in confidence to Lawrence Tharp, Personnel Administrator, National Superconducting Cyclotron Laboratory, East Lansing, MI 48824-1321.

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DP. S&P. TECH SUPPORT MGRS

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(1) Do you have open requisitions that need to be filled?

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(3) Are you frustrated enough to call and listen to our alternative approach to recruiting?

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SYSTEMS PROGRAMMER III

Requires a Bachelor's degree in Computer Science or related discipline or equivalent combination of schooling and related work experience. Must have a few years experience in systems programming with demonstrated ability to deal with communication software on existing and future data processing equipment.

Excellent fringe benefits. Interested applicants send resume to Ref. No. 110 stating salary requirements.

THE STATE UNIVERSITY
OF NEW JERSEY
RUTGERS

Division of Personnel Services
New Brunswick, N.J. 08903

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Equal Opportunity Employer

CONSULTANT

Market professional consulting services. Consult with clients analyzing their needs in a variety of fields, with primary emphasis in the area of economics. Develop multi-dimensional software systems applicable to these fields. Provide professional services in areas relating to statistical analysis, utilizing the following: CLUSTAN, SPSS, SAS and BMDP. Integrate said analysis into recommended strategies and assist top management in implementing these strategies. Requires a M.S. in Computer Science, 2 years academic training in economics and 1 year direct experience. Salary $30,000/year for a 40 hour week. Send resume to Ms. Carolyn Korbos Miller, President, Omega Research Consultants, Inc., 1606 West 103rd St., Chicago, IL 60643.

ADMINISTRATIVE APPLICATION ANALYSIS/PROGRAMMER

Minimum of 5 years of administrative data processing with a knowledge of DBMS and COBOL. Experience with Burroughs Cobol and DMS II, and DEC VAX highly desirable. B.S. degree, or CDP-CCP highly desirable. Duties include working directly with users to implement, modify and maintain the program in systems for their offices.
Salary dependent upon qualifications. Closing date for receipt of application is April 8, 1983.
Send resume to:

Richard Caston
D. W. Mattson Computer Center
Box 5071
Tennessee Technology University
Cookeville, TN 38505

AA/EEO Employer

PROGRAMMING SYSTEMS

- FORTRAN/PL-1: 1+ yrs exp. DEC equip a+. BS/MSCS. $24-42K
- SYS PROG'S: BAL, 4341 exp. OS/MVS. Pluses: VTAM, CICS $28-47K
- SOFTWARE ENGR'S: BSCS/EE. C3, Aero, JTIDS exp. 3-8 yrs to $55K
- COBOL/CICS. OS or DOS any exp. all levels avail. $24-55K

250+ openings. All fees/expenses fully paid

Drew Charney 201-342-3060
ACME RECRUITING
214 Main St., Hackensack, N.J. 07601

COMPUTER SCIENCE: Tenure track faculty position beginning Fall 1983. Grand View College needs person to teach course in Computer Science. Masters Degree required; Doctorate preferred. Teaching experience desirable. Instructor or Assistant Professor rank. Salary range $15-$20,000 for eight months. Preference given to candidates whose background indicates the person will be comfortable working in a small, private, church-related college setting with an expanding program. Send letter of application and credentials to Dr. Thomas [illegible], Vice President for Academic Affairs, Grand View College, 1200 Grandview Avenue, Des Moines, Iowa 50316. Deadline April 1, 1983. An equal opportunity employer.

Grass Valley Group

Systems Programmer

This challenging data processing opportunity has been recently created at a Northern California Sierra foothills location.

The position involves the maintenance of DEC VAX/VMS O/S, DECNET, plus H/W and S/W evaluation.

One plus years' systems programming experience and/or a computer science degree considered a plus.

Send resumes to Sylvia Shelton, The Grass Valley Group, Inc., Dept. AA12, P.O. Box 1114, Grass Valley, CA 95945. An equal opportunity employer M/F/H/V.

A TEKTRONIX COMPANY

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Classifieds work.

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

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Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy. Figure about 25 words to a column inch, not including headlines.

Cost: Our rates are $112.70 per column inch. (A column is 2" wide.) Minimum size is two column inches (2" wide by 2" deep) and costs $225.40 per insertion. Extra space is available in half-inch increments and costs $56.35. Box numbers are $15.00 extra.

Billing: If you're a first-time advertiser, (or if you have not established an account with us.) WE MUST HAVE YOUR PAYMENT IN ADVANCE.

Ad size desired:

________ columns wide by ________ inches deep.

Issue Date(s): ____________________

Section: ____________________

Signature: ____________________

Name: ____________________

Company: ____________________

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- Functional accounting/finance experience desired.

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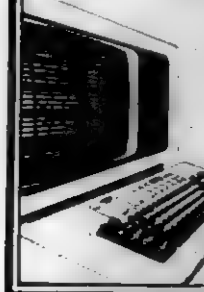

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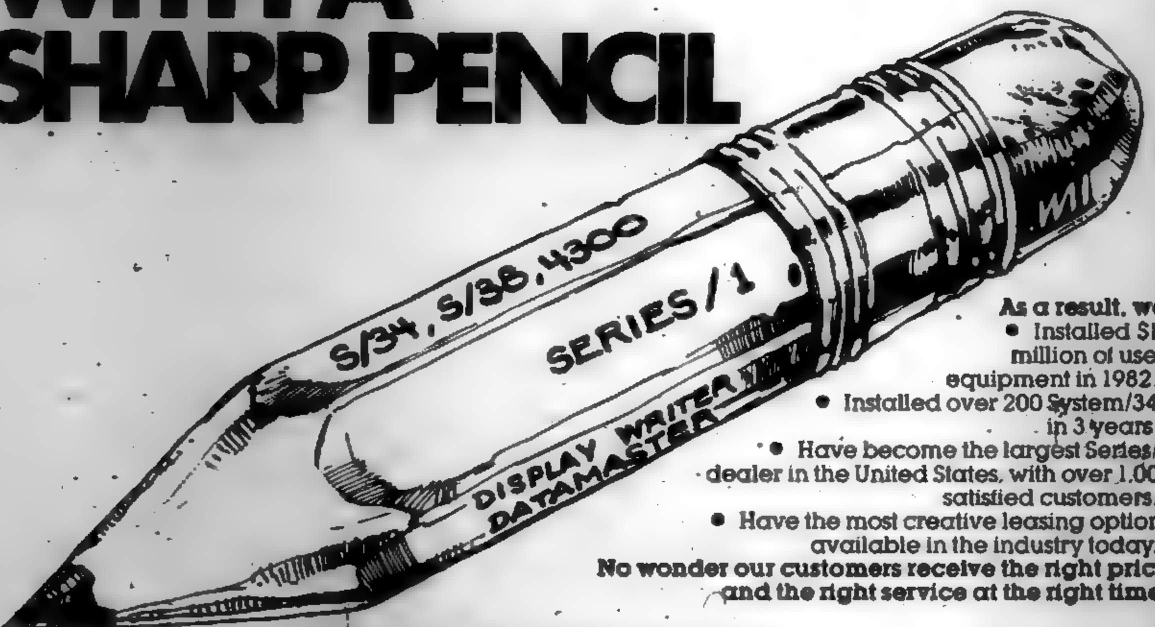

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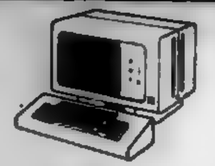

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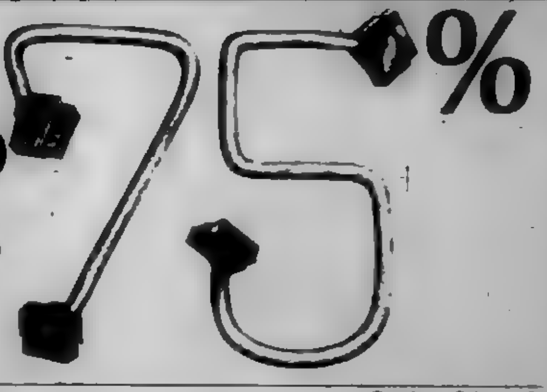

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BC11A-06/BJ	External Unibus 6'	160	115	28
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BC11A-10/BJ	External Unibus 10'	182	130	28
BC11A-15/BJ	External Unibus 15'	210	160	23
BC11A-17/BJ	Special Cable 17FT	215	170	20
BC11A-20/BJ	External Unibus 20'	220	175	20
BC11A-25/BJ	External Unibus 25'	230	180	21
BC11A-35/BJ	External Unibus 35'	400	300	25
BC11A-50/BJ	External Unibus 50'	450	350	22
BC11K-25/BJ	H856 1 End 20 Pair 25'	180	90	50
BC11S-25/BJ	H856 TO H856 18 TW PR 25'	138	90	34
BC11S-50/BJ	H856 TO H856 18 TW PR 50'	173	125	27
BC11S-A0/BJ	H856 TO H856 18 TW PR 100	277	190	31
BC20Y-25/BJ	TU58 Cable 25 FT	120	45	62
BC20Z-25/BJ	TU58 Cable 25 FT	120	45	62
BC21S-25/BJ	VK170 10 Pin Comm Cable	120	40	66
BC22A-10/BJ	Null Modem RS 232 C 10'	48	30	37
BC22A-25/BJ	Null Modem RS 232 C 25'	55	40	27
BC22A-35/BJ	Null Modem RS 232 C 35'	65	50	23
BC22A-50/BJ	Null Modem RS 232 C 50'	80	60	25
BC22B-10/BJ	RS232C Male to Fem 14 CND 10'	55	30	45
BC22B-25/BJ	RS232C Male to Fem 14 COND 25	65	40	38
BC22B-35/BJ	RS232C Male to Fem 14 COND 35	75	55	26
BC22B-50/BJ	RS232C Male to Fem 14 COND 50	90	60	33
BC24C-10/BJ	Null Modem Cable	75	50	33
BC24C-25/BJ	25PIN Fem-10PIN Null Modem 25	100	85	15
BC24Z-A0/BJ	Long Line Cable Kit 100 FT	500	350	30
BC24Z-E0/BJ	Long Line Cable Kit 500 FT	1,350	975	27
BC24Z-H5/BJ	Long Line Cable Kit 750 FT	1,750	1,325	24
BC26B-01/BJ	VK100 Y-Cable 1 FT	85	50	41
BCV1A-06/BJ	6 Foot Cable Ass (2-3)	250	160	36
BCV1B-06/BJ	6 Foot Cable Ass (1-2)	350	175	50

Part Number	Description	Regular Price	Sale Price**	% Off
4A-LOTCB-AA/BJ	Lot of 5 BC01V-25 (25 Cables)	540	375	30
4A-LOTCB-AB/BJ	Lot of 10 BC01V-25 (25 Cables)	880	685	22
4A-LOTCB-AG/BJ	Lot of 5 BC03M-A0 (100 Cables)	616	425	31
4A-LOTCB-AH/BJ	Lot of 10 BC03M-A0 (100 Cables)	1 116	750	33
4A-LOTCB-AJ/BJ	Lot of 25 BC03M-A0 (100 Cables)	2 760	1 695	39
4A-LOTCB-AK/BJ	Lot of 50 BC03M-A0 (100 Cables)	4 987	3 195	36
4A-LOTCB-AQ/BJ	Lot of 5 BC05C-25 (25 Cables)	543	425	21
4A-LOTCB-AR/BJ	Lot of 10 BC05C-25 (25 Cables)	1 015	795	21
4A-LOTCB-AS/BJ	Lot of 25 BC05C-25 (25 Cables)	2 303	1 885	18
4A-LOTCB-AT/BJ	Lot of 25 BC05C-25 (25 Cables)	4 375	3 585	17
4A-LOTCB-BC/BJ	Lot of 5 BC05D-25 (25 Cables)	648	475	27
4A-LOTCB-BD/BJ	Lot of 10 BC05D-25 (25 Cables)	1 167	895	23
4A-LOTCB-BE/BJ	Lot of 25 BC05D-25 (25 Cables)	2 782	2 175	22
4A-LOTCB-BF/BJ	Lot of 50 BC05D-25 (25 Cables)	5 157	3 950	23
4A-LOTCB-BG/BJ	Lot of 5 BC05D-50 (50 Cables)	685	525	24
4A-LOTCB-BH/BJ	Lot of 10 BC05D-50 (50 Cables)	1 310	995	24
4A-LOTCB-BJ/BJ	Lot of 25 BC05D-50 (50 Cables)	3 115	2 375	23
4A-LOTCB-BK/BJ	Lot of 50 BC05D-50 (50 Cables)	5 750	4 495	21
4A-LOTCB-CG/BJ	Lot of 5 BC11A-02 (2 Cables)	675	495	26
4A-LOTCB-CH/BJ	Lot of 10 BC11A-02 (2 Cables)	1 195	860	28
4A-LOTCB-CJ/BJ	Lot of 25 BC11A-02 (2 Cables)	2 800	1 995	28
4A-LOTCB-CK/BJ	Lot of 50 BC11A-02 (2 Cables)	5 272	3 895	26
4A-LOTCB-CL/BJ	Lot of 5 BC11A-10 (10 Cables)	844	675	20
4A-LOTCB-CM/BJ	Lot of 10 BC11A-10 (10 Cables)	1 660	1 200	28
4A-LOTCB-CN/BJ	Lot of 25 BC11A-10 (10 Cables)	3 785	2 925	22
4A-LOTCB-CP/BJ	Lot of 50 BC11A-10 (10 Cables)	7 125	5 590	21
4A-LOTCB-CQ/BJ	Lot of 5 BC11A-15 (15 Cables)	986	775	22
4A-LOTCB-CR/BJ	Lot of 10 BC11A-15 (15 Cables)	1 860	1 495	20
4A-LOTCB-CS/BJ	Lot of 25 BC11A-15 (15 Cables)	4 454	3 660	18
4A-LOTCB-CT/BJ	Lot of 50 B11A-15 (15 Cables)	8 384	6 995	16
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4A-LOTCB-DC/BJ	Lot of 10 BC22A-10 (10 Cables)	436	260	40
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4A-LOTCB-DE/BJ	Lot of 50 BC22A-10 (10 Cables)	1 925	1 095	43
4A-LOTCB-DF/BJ	Lot of 5 BC22A-25 (25 Cables)	262	190	27
4A-LOTCB-DG/BJ	Lot of 10 BC22A-25 (25 Cables)	480	350	27
4A-LOTCB-DH/BJ	Lot of 25 BC22A-25 (25 Cables)	1 181	850	28
4A-LOTCB-DJ/BJ	Lot of 50 BC22A-25 (25 Cables)	2 235	1 495	33
4A-LOTCB-DK/BJ	Lot of 5 BC22B-10 (10 Cables)	257	145	43
4A-LOTCB-DL/BJ	Lot of 10 BC22B-10 (10 Cables)	487	270	44
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4A-LOTCB-DN/BJ	Lot of 50 BC22B-10 (10 Cables)	2 165	1 150	46
4A-LOTCB-DP/BJ	Lot of 5 BC22B-25 (25 Cables)	307	195	36
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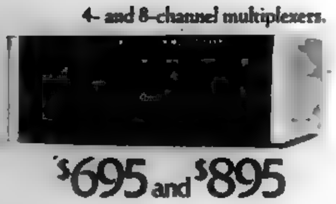

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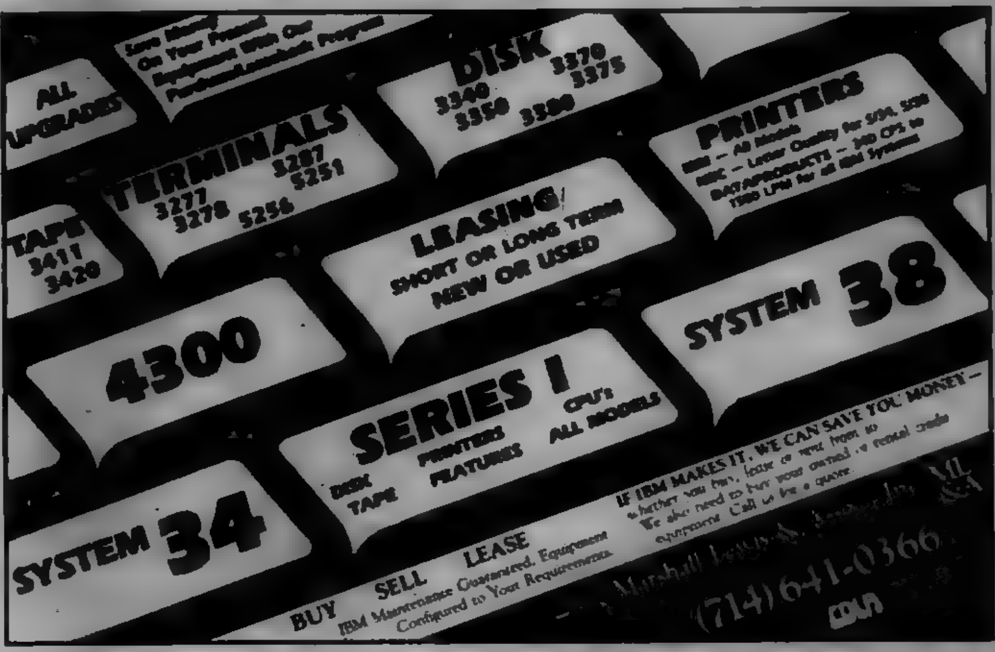
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BIDS & PROPOSALS

NEW SOUTH WALES GOVERNMENT
DEPARTMENT OF CORRECTIVE SERVICES AUSTRALIA
Prisoner Records Computer Package

Proposals are requested for a package covering a prisoner records and accommodation system for institutions operated by the Department of Corrective Services.

A user requirement statement has been prepared in respect of the Department's needs and this statement could be amended to facilitate appropriate packages. (A copy of this statement is available upon request.) Where necessary, Departmental organisational structure could also be modified to accommodate a successful proposal.

The proposal should cover a complete software package and include a recommendation for suitable hardware.

It is essential that the proposals be based on existing systems currently operational either within a gaol environment or a similar environment, which could be readily modified to meet the Department's needs.

Interested organisations are invited to discuss the matter further with the Department's Information Services Branch, and appointments can be made with Mr E Manning or Mr R Coote on telephone (Australia) (02) 217 8125.

Proposals should be clearly marked "Proposal for Computerised Records and Accommodation System", and be delivered by 25th March, 1983.

New South Wales Department of Corrective Services,
Information Services Branch,
Roden Cutler House, 24 Campbell Street,
SYDNEY, N.S.W. 2000. AUSTRALIA.
OR: G.P.O. Box 31, SYDNEY. N.S.W. 2001.
Telex: N.S.W. PREM. AA21269
Attention: N.S.W. Dept. Corrective Services

If you require further information in regard to this matter please contact Mr L. Gardner, Administrative Officer, Management Services, on 217 8316 or Mr E. Manning, Information Services Branch, on 217 8125.

P F Crombie
Chief Administrative Officer

017991

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NOTICE TO BIDDERS

North Shore Community College invites proposals to provide an Integrated Financial Records System consisting of package based applications software and installation support. The needed applications include fund accounting, budgeting, encumbrance/purchasing and financial aid. The system will operate on a Data General Eclipse M-600 computer under AOS.

Proposal forms and instructions may be obtained at the office of Mr. J. Laurence Reeves, Program Coordinator, North Shore Community College, 3 Essex Street, Beverly, MA 01915 or by calling (617) 927-4850 ext. 360. Notification of intent to propose must be received by March 25, 1983 at the above address.

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Vice President of Marketing
CORTEX Corporation
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Wellesley, MA 02181
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Bulletin Board ads come in standard units (one column wide by one inch deep) and standard typefaces. (Units may be combined to produce deeper ads, but one column is the maximum width and no units of less than one inch are available.) Ads are arranged under headings (such as "IBM", "DEC" or "Printers"). The headline of the ad is set in larger, bold type, and should contain the standard equipment identification. The body copy should describe the equipment very briefly and give the person to contact. This is all the information an interested buyer needs to follow up. No ad should have more than one piece of equipment or software.

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Ads are accepted in the mail, by phone or by telecopier. Ads can be accepted up until the Monday before issue (7 days in advance of issue date). You should write out your ad before submitting it. (The standard size will hold approximately 25 words of copy.)

Once you've written your ad, send it in with the coupon below or call one of our ad-takers. (If your company has never advertised with us before we request a check with your order.)

Remember that all ads are standard. No special typefaces, no borders and no logos are allowed. Ads are set on a six-column page in our classifed section under the heading "The Bulletin Board.". We assume no liability for errors beyond the price of the ad in the case of material errors.

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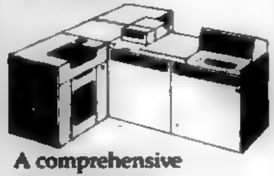

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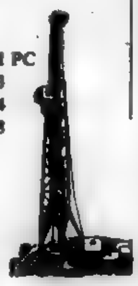

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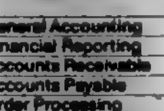

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The Back Store ... 80
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BMC Software ... 55
Boole & Babbage ... 38-39
M. Bryce & Associates ... ID/14
Bunker Ramo Corp. ... 106
Centronics ... 52
Chubb Institute ... 79
Cincom Systems ... 17
Codex Corporation ... 40-41
Comdata ... 71
ComDesign ... 54
Comdisco ... 53
Compaq ... 43
Computer Associates ... 5
Computer Consoles ... 42-43
Computer Management Research ... 44
Computer Technology Group ... ID/6
Computerworld Office Automation ... 58
Computerworld Subscriptions ... 98
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Cullinet ... 76-77
CW International Marketing ... 86
Data Base Management ... 72
Data General ... 88-89
Datamation ... 36
Data Processing Design ... 16
Norm DeNardi Enterprises ... 29
Digilog ... 73
Digital Equipment Corp.
  Field Service ... 27
Digital Equipment Corp.
  Micro ... 82-83
Digital Equipment Corp.
  NPM/Peripherals ... 37
Digital Equipment Corp.
  NPM VAX ... 66-67
Direct, Inc. ... 108
Dorlen Products ... 102
DP Facilities ... 104
Eastman Kodak Co. ... ID/27
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Ergonomics Software Inc. ... 69
Falco Data Products ... 142
Fibronics ... 70
Fusion Products ... 107
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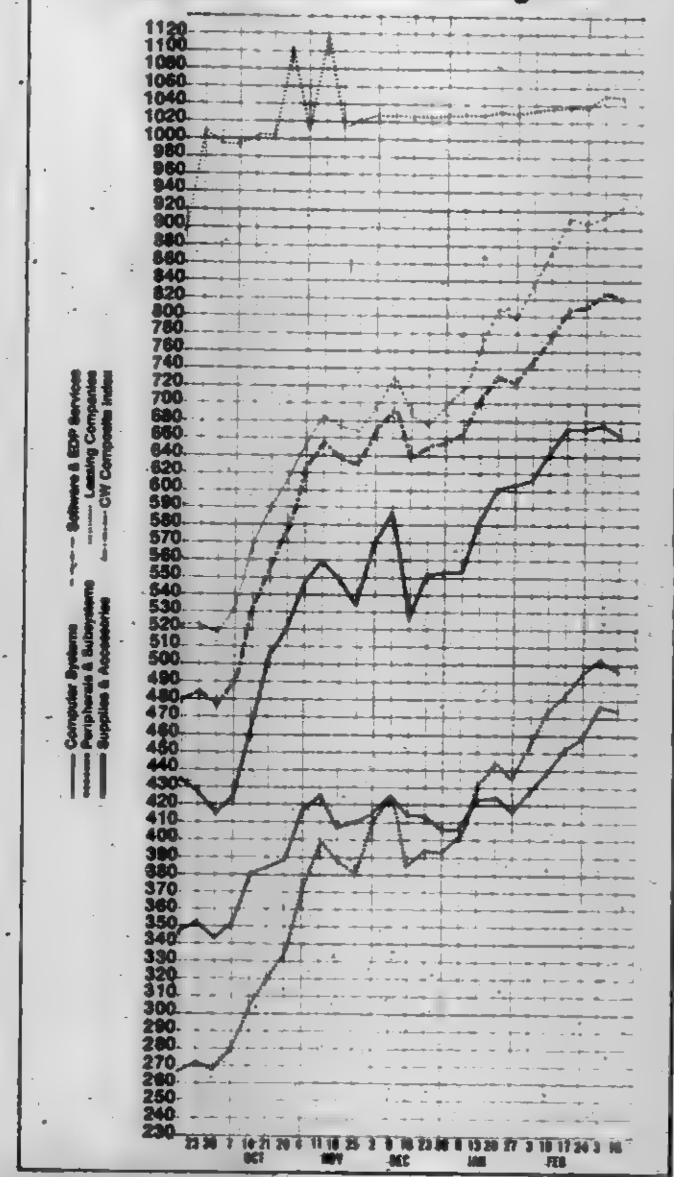
Industrial Computer Controls ... 36
Infodata ... 32
Informatics ... 14-15
Information Builders ... 63
Information Science Inc. ... ID/4-ID/5
Innovative Electronics ... 72
Integrated Technology ... 98
International Turnkey Systems, Inc. ... 40
IPL Systems ... 34-35
ISSCO ... 107
KW Control Systems ... 81
Lear Siegler ... 101
Lee Data Corp. ... 84
Levi, Ray & Shoup, Inc. ... ID/30
Local Data ... 64
Madzar ... 64
Management Archetypes Corp. ... 104
Marathon Software & Services ... 65
Maxell-Computers ... ID/28-ID/29
MCBA ... ID/11
Memorex Corporation ... 100
Microterm ... 68
Mohawk Data Sciences ... 29,31,33
Monowon on DEC ... 30
MTI Systems Corp. ... 72
MV Associates ... 108
National Advanced Systems ... 50-51
NCR Corporation ... ID/2,92
Newcorp Products ... 54
Okidata ... 38
Omni Offices ... 84
On Line Business Systems ... 69
On-line Software ... ID/24
Phaze Info. Machines Corp. ... ID/7
Popcom ... 87
PRC of America ... ID/30
Professional Computer Resources ... ID/19
Protocol Computers ... 22,23,24,25
Qume ... 26
Radio Shack ... ID/3
RAMTEK ... ID/10
Renex ... 18
Rolm Corporation ... 73
Robert Routman Associates ... 22
SAS Institute ... 60
Saturn Systems ... 91
Scientific Methods, Inc. ... 105
SDI ... 33
Signal Technology ... 54
Software AG ... 65
Software Corp. of America ... 49
Sorbus, Inc. ... ID/32
SPSS, Inc. ... 19
Star Technologies and Research ... 57,60
Storage Technology ... 78
Stratus Computer ... ID/15
Syncsort ... 7
System Strategies ... 72
Tandem Computers ... 98-99
T & B Computing ... 62
Teleprocessing Products ... 18
Teleray ... ID/20
Telex ... ID/23
Term-Tronics ... 23
Thomas Engineering ... 106
Tominy ... ID/12
Tone Software ... 64
Transnet Corporation ... 62
Ungermann-Bass ... ID/18
United Airlines ... ID/22
Unitronix ... 79
University Computing ... 94-97
Viking Software ... 64
Wadsworth Electronic Publishing ... ID/25
Walker Interactive Products ... 61
Wolfe Computer ... ID/11
Xerox Corporation ... 12-13
Zytron ... ID/8

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Computerworld Stock Trading Index



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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, MARCH 9, 1983

All statistics compiled computed and formatted by
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Cambridge Mass 02139

COMPUTER SYSTEMS

EXCH		PRICE 1982-83 RANGE (1)	CLOSE MAR 9 1983	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP	17- 44	38 7/8	-2	-4.8
N	BURROUGHS CORP	28- 48	46	-1 5/8	-3.4
B	COMPUTER AUTOMATION	7- 17	15 1/4	+ 3/8	+2.5
N	CONTROL DATA CORP	21- 51	49	- 3/4	-1.5
N	CRAY RESEARCH INC	20- 48	42 1/8	-2 3/8	-5.8
N	DATA GENERAL CORP	20- 61	58 1/4	+1 1/4	+2.1
N	DATAPOINT CORP	11- 38	22 3/4	-1 1/4	-5.2
N	DIGITAL EQUIPMENT	62-132	130 1/8	+5 7/8	+4.7
A	EECO INC	8- 12	11 3/4	0	0.0
N	ELECTRONIC ASSOC.	5- 12	10	+ 3/8	+3.8
N	FLOATING POINT SYST	18- 37	35 1/8	+ 1/8	+0.3
N	FOXBORO	22- 43	37 1/8	-5 3/8	-12.8
O	FULCRUM COMP GRP	1- 3	1/4	0	0.0
O	GENERAL AUTOMATION	3- 8	6 3/4	+ 1/2	+8.0
N	HARRIS CORP	20- 51	45 7/8	-2 3/8	-4.9
N	HEWLETT-PACKARD CO	38- 87	81	-8 7/8	-9.8
N	HONEYWELL INC	60-104	94 3/8	-3 3/4	-3.8
N	IBM	57-103	102 1/4	+ 1/8	+0.1
O	IPL SYSTEMS INC	5- 11	8 3/4	-1 1/4	-12.5
B	MAGNUSON COMP SYSTS	2- 9	3	0	0.0
N	MANAGEMENT ASSIST	7- 18	14 5/8	-1 1/2	-9.3
O	MINI-COMPUTER SYST	1- 2	5/8	0	0.0
N	MODULAR COMPUTER SYS	6- 15	12	-1 7/8	-13.5
N	MOHAWK DATA SCI	10- 19	16	-1 1/8	-6.5
N	NCR	38-108	103 3/4	-3	-2.8
N	PERKIN-ELMER	17- 33	30 1/2	+ 5/8	+2.0
N	PRIME COMPUTER INC	16- 45	41 7/8	-2 3/8	-5.3
N	SPERRY CORP	21- 38	35 5/8	0	0.0
O	TANDEM COMPUTERS INC	14- 34	27 3/8	+2 1/4	+8.8
N	TEXAS INSTRUMENTS	71-178	158 1/8	+3 5/8	+2.3
A	WANG LABS "B"	13- 37	33 1/4	-1 1/2	-4.3
A	WANG LABS "C"	11- 37	33 1/2	-1 3/8	-3.9

LEASING COMPANIES

EXCH		PRICE 1982-83 RANGE (1)	CLOSE MAR 9 1983	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE FINANCIAL CP	22- 36	32 1/4	-1 1/2	-4.4
N	COMDISCO INC	7- 28	26 1/4	+ 3/8	+1.4
O	COMMERCE GROUP CORP	1- 1	1/4	0	0.0
O	COMPUTER INVSTRS GRP	1- 2	1/2	0	0.0
O	CONTINENTAL INFO SYS	5- 21	18 1/2	- 1/4	-1.2
N	DPF INC	5- 14	12 3/8	- 7/8	-6.6
O	ITEL	1- 3	3/4	0	0.0
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	18- 41	40 1/8	+ 1/2	+1.2

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON;
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
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SOFTWARE & EDP SERVICES

EXCH		PRICE 1982-83 RANGE (1)	CLOSE MAR 9 1983	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 4	3 3/4	+ 1/4	+7.1
O	ADVANCED SYSTEMS INC	8- 24	22 1/2	-1 1/4	-5.2
O	AGS COMPUTERS INC	7- 22	19	- 3/4	-3.7
N	ANACOMP INC	8- 22	20 3/4	-1	-4.5
O	ANALYSTS INTL CORP	5- 8	8 3/4	0	0.0
A	APPLIED DATA RES.	16- 48	47 5/8	+1 7/8	+4.0
O	ASK COMPUTER SYSTEMS	12- 35	29 1/2	- 1/4	-0.8
B	ASTRADYNE COMP IND	1- 5	4 1/2	- 1/8	-2.7
N	AUTOMATIC DATA PROC	21- 40	38	+1 3/4	+4.8
O	CDA COMPUTER ASSOC	5- 14	13 1/4	- 1/2	-3.6
O	COMPUTER ASSOC INT'L	12- 47	43	-3 1/2	-7.5
O	COMPUTER HORIZONS	2- 12	14	+4	+40.0
O	COMPUTER NETWORK	4- 16	8 1/2	- 1/2	-5.5
N	COMPUTER SCIENCES	11- 23	21 3/8	- 3/8	-1.7
O	COMPUTER TASK GROUP	8- 18	17 3/4	+1 1/2	+9.2
O	COMPUTER USAGE	2- 22	20 3/4	+5 1/2	+38.0
O	COMPUTONE SYSTEMS	18- 38	30 3/4	-2 1/2	-7.5
O	COMSERV CORP	11- 20	17 1/4	- 3/4	-4.1
O	COMSHARE	8- 13	12 7/8	+ 1/2	+4.0
N	CULLINET SOFTWARE	12- 35	33	+2	+6.4
O	CYCARE SYSTEMS INC	9- 18	16 1/2	+ 3/4	+4.7
O	DATA DIMENSIONS INC	1- 2	1/4	0	0.0
O	DATATAB	0- 2	3/4	0	0.0
O	DYATRON CORP	2- 4	3 1/2	- 1/4	-6.6
N	ELECTRONIC DATA SYST	18- 58	56	+2 3/4	+5.1
N	INFORMATICS INC	10- 28	27 1/4	+ 1/2	+1.8
O	INSYTE CORP	1- 3	1 7/8	- 1/8	-6.2
O	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	4- 8	7 1/2	- 1/4	-3.2
A	LOGICON	12- 34	34 1/4	+2 1/4	+7.0
O	MNGT SCI AMER INC	8- 28	23	-2 1/2	-9.8
O	MATHEMATICA INC	12- 22	18	-1 1/2	-7.3
O	MATHEMATICAL APP GRP	12- 22	21 1/2	+ 1/2	+2.3
O	NATIONAL DATA CORP	9- 24	21 1/4	-1 1/8	-5.0
O	PANSOPHIC SYSTEMS	8- 25	23 3/8	- 7/8	-3.5
N	PLANNING RESEARCH	6- 18	15	+ 1/8	+0.8
O	PROGRAMMING & SYS	1- 4	3 3/8	0	0.0
O	REYNOLDS & REYNOLDS	17- 38	37 1/2	- 3/4	-1.9
O	SEI CORP	11- 25	22 1/2	- 1/2	-2.0
O	SHARED MEDICAL SYST	13- 36	32 1/2	-3 3/4	-10.3
O	SCIENTIFIC COMPUTERS	8- 13	12 1/2	+ 3/4	+6.3
O	SOFTWARE AG	9- 17	10 1/4	- 1/2	-4.6
N	TYMSHARE INC	12- 30	23 3/4	-1 1/8	-4.5
A	URS CORP	5- 14	14 1/4	+1 3/4	+14.0
N	WYLY CORP	7- 13	12 3/8	+1 1/2	+13.7

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1982-83 RANGE (1)	CLOSE MAR 9 1983	WEEK NET CHNGE	WEEK PCT CHNGE
P	AM INTERNATIONAL	2- 4	3 5/8	- 1/8	-3.3
A	ANDERSON JACOBSON	8- 28	18	-1	-5.0
O	AUTO-TROL TECHNOLOGY	8- 21	17	-1 3/4	-9.8
O	BANCTEC INC	7- 23	16	-1	-5.8
A	BEEHIVE INT'L	4- 11	11 1/4	+2	+21.6
A	BOLT,BERANEK & NEW	13- 40	38 3/4	-1 1/2	-3.9
O	CAMBEX CORP	2- 4	2 1/8	- 1/8	-5.5
N	CENTRONICS DATA COMP	8- 20	19 1/2	+ 1/2	+2.6
A	CETEC CORP	4- 8	8	+ 1/4	+3.2
O	COGNITRONICS	2- 14	13 1/8	+2 1/4	+20.6
O	COMPUTER COMMUN.	1- 2	1 3/8	0	0.0
A	COMPUTER CONSOLES	15- 44	36 1/8	+1 1/8	+2.9
O	COMPUTER DEVICES INC	4- 21	15	- 3/8	-2.4
O	COMPUTER TRANSCEIVER	4- 8	7 3/8	- 1/4	-3.2
N	COMPUTERVISION CORP	18- 45	41 1/8	- 1/4	-0.6
N	CONRAC CORP	21- 36	32 7/8	+ 5/8	+1.9
A	DATA ACCESS SYSTEMS	1- 4	1 1/2	0	0.0
A	DATAPRODUCTS CORP	18- 41	37 1/2	- 3/4	-1.9
A	DATARAM CORP	5- 12	10 3/8	+ 1/8	+1.2
O	DATUM INC	2- 11	10 1/2	+ 5/8	+6.3
O	DAVID JAMISON CARLYL	2- 7	3 7/8	- 7/8	-18.4
O	DECISION DATA COMPUT	3- 14	12	- 3/4	-5.8
O	DELTA DATA SYSTEMS	1- 4	3 1/4	0	0.0
N	ELECTRONIC M & M	5- 9	6 1/2	- 1/4	-2.8
O	EVANS & SUTHERLAND	18- 50	41 1/2	-1 3/4	-4.0
O	GANDALF TECHNOLOGIES	10- 22	18 1/4	+ 1/8	+0.7
N	GEN'L DATA COMM IND	6- 19	17 5/8	- 1/2	-2.7
O	GENERAL TERMINAL CP	0- 2	7/8	-	-8.2
O	GREAT SOUTHWEST IND	2- 6	2 1/2	0	0.0
N	HAZELTINE CORP	22- 38	36 5/8	-1 5/8	-2.7
O	ICOT CORP	3- 10	7 7/8	+ 1/8	+1.6
O	INFORMATION INTL INC	10- 22	20 1/4	+1	+5.1
O	INTEL CORP	21- 47	43 1/4	-1 3/4	-3.8
O	IPL SYSTEMS INC	5- 11	8 3/4	-1 1/4	-12.5
A	LUNDY ELECTRONICS	7- 16	14 1/2	0	0.0
A	MSI DATA CORP	10- 36	18 5/8	-1 1/8	-5.6
O	NETWORK SYSTEMS CORP	19- 43	38 1/8	-2 7/8	-6.9
O	ONEX	3- 5	3 1/2	0	0.0
N	PARADYNE CORP	24- 51	46 1/4	0	0.0
A	PENRIL CORP	7- 13	12 5/8	+1 1/8	+9.7
O	RAMTEK CORP	12- 28	23 1/2	-1 1/4	-5.0
N	RECOGNITION EQUIP	4- 13	10 3/4	0	0.0
O	SCAN DATA	1- 3	1 3/8	0	0.0
N	STORAGE TECHNOLOGY	18- 33	23 5/8	0	0.0
O	SYKES DATATRONICS	6- 27	8 7/8	-1 1/4	-12.3
A	T BAR INC	7- 14	12 1/4	+1 3/8	+12.6
A	TEC INC	8- 12	8 1/2	- 1/2	-5.5
N	TEKTRONIX INC	34- 75	70 5/8	-4 5/8	-6.0
N	TELEX	5- 27	25	0	0.0
O	TESDATA SYSTEMS CP	3- 10	8 3/8	- 3/8	-4.2
N	TIMEPLEX INC	7- 24	18 1/8	-1 1/8	-5.8
O	VISUAL TECHNOLOGY	8- 20	18 3/4	- 1/4	-1.2
O	WILTEK INC	1- 3	2 7/8	+ 1/4	+9.5

SUPPLIES & ACCESSORIES

EXCH		PRICE 1982-83 RANGE (1)	CLOSE MAR 9 1983	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN BUS PRODS	11- 22	21 5/8	+ 1/4	+1.1
O	BALTIMORE BUS FORMS	1- 2	1	0	0.0
N	BARRY WRIGHT	13- 25	24 1/4	+ 3/4	+3.1
O	CYBERMATICS INC	1- 1	1 3/8	0	0.0
A	DUPLEX PRODUCTS INC	12- 21	20	- 1/8	-0.6
N	ENNIS BUS. FORMS	16- 30	28 1/2	+ 1/4	+0.8
N	3M COMPANY	48- 82	80	- 1/8	-0.1
N	MOORE CORP LTD	28- 48	45 1/4	- 3/4	-1.6
N	NASHUA CORP	8- 18	14 1/8	+ 3/8	+2.7
O	STANDARD REGISTER	32- 86	83	-2 1/2	-2.8
A	TAB PRODUCTS CO	9- 23	21 1/2	-1 3/8	-6.0
N	WALLACE BUS FORMS	22- 38	34 5/8	- 3/8	-1.1

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UMI

Commerce Report Says We're in Trouble

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The Commerce Department has advised the White House that the U.S. faces a continuing decline in the competitiveness of its high-technology industries, including computer hardware and software, semiconductors, fiber optics and robotics.

The argument that American high-tech firms are confronting increased competition from foreign countries, particularly Japan, is not new; the U.S. computer and semiconductor industries have been making the same claim for several years. The significance of the Commerce Department report, released last week, is that it was commissioned — in December 1981 — by the Cabinet Council on Commerce and Trade, which presumably will use the document as a basis for a concerted, White House-backed response to declining U.S. high-tech competitiveness.

> *'In terms of research and development spending, the report noted, overall, the U.S. has larger outlays than West Germany, Japan and France. But, Commerce said, those nations are raising their R&D financing, and U.S. government spending increasingly goes for military projects.'*

In developing the report, the Commerce Department held a series of meetings with high-level executives of the computer, telecommunications, semiconductor and robotics industries in this

(Continued on Page 8)

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NEWSPAPER

It Didn't Weather the Storm

Ten thousand gallons of water and five tons of air-conditioning equipment crashed down on Mazda Motors Corp. of America's IBM 4341 system when a storm lashed its Compton, Calif., data center. Story on Page 7.

NCR Mainframe Built On 32-Bit VLSI Chips

By Ed Scannell
CW Staff

DAYTON, Ohio — NCR Corp. last week brought out what it claimed is the first 32-bit mainframe for general-purpose business applications that incorporates very large-scale integration.

Labeled the NCR 9300, the system is the first to use NCR's compact 32-bit chip set and is small enough to fit on top of a desk.

The bread box-size system reportedly has twice the processing power but takes up seven times less floor space than NCR's I-9020 system at the same cost. A 9300 configuration that supports 10 to 14 users and is priced at $72,071 is the performance peer of a similarly configured Digital Equipment Corp. VAX-11/730 but costs 45% less, NCR claimed.

The 32-bit system's entry-level model carries a $24,235 price tag, while the high-end version lists for $125,000.

NCR also announced a remote diagnostics service for users of the new 9300 system.

The diagnostics service is modem-based, operating via telephone lines, and costs $1,187/year for users with a typical 9300 configuration. The company claims comparable on-site field engineering would be priced at $1,484.

With the introduction of the 9300, NCR President Charles Exley Jr. said the company's other mainframes will "require a repricing and repositioning which will be forthcoming," although he declined to say exactly when it would take place.

(Continued on Page 8)

Large Users to Bypass Phone Companies

By Phil Hirsch
CW Washington Bureau

Major customers of the nation's telephone operating companies may be migrating to "bypass" suppliers faster than most industry pundits and government policymakers have predicted, a survey that *Computerworld* conducted last week among a random group of large corporations and institutions indicates.

All but one of the seven users contacted — Xerox Corp., Bank of America, General Electric Co., Monsanto Co., MIT, the City of New York and Aeronautical Radio, Inc., which operates a leased-line network for the nation's major airlines — are actively involved in planning or building communications facilities that would bypass telephone company local-exchange networks. Each organization spends at least $50 million annually on domestic communications, and some spend more than twice that much.

All of the seven users are now doing business with other common carriers and/or interconnect (independent) terminal makers. Asked about their willingness to buy competing services and equipment from non-telephone company suppliers, several called the question irrelevant because they are already doing so.

A recent "Status Report on Near-Term Local Bypass Developments" from the Federal Communications

(Continued on Page 6)

Product Spotlight

Pursuers Hot on AT&T's Heels

By Bruce Hoard
CW Staff

AT&T is ducking bullets from a posse of challengers as it is thrust into a new age of unregulated communications competition. When the smoke clears, the reshaped U.S. common carrier market will stand in the ruins of its predecessor.

Stripped of its communications monopoly by the federal government, the world's largest corporation is fighting for its future. The Bell operating companies, which own and operate the local-exchange facilities, will become fully separated from AT&T as of Jan. 1, 1984.

AT&T last week replaced the 1.5M bit/sec portion of its Dataphone Digital Service. Story on Page 6.

Bringing the battle to Bell is a host of other common carriers that range from United States Transmission Systems, which offers private-line

(Continued on Page 11)

AT&T to License Videotex Patent

By Phil Hirsch
CW Washington Bureau

NEW YORK — AT&T has reportedly agreed to license its videotex display system on reasonable, nondiscriminatory terms, thus enabling the American National Standards Institute to proceed with development of a videotex standard.

The news came last week in an interview with Ansi's legal counsel, William H. Rockwell. Rockwell said he would advise Ansi's X3L2 subcommittee to continue its development of the proposed standard, known as the North American Presentation Level Protocol Syntax.

Until last week's announcement, NAPLPS' future was in doubt because the underlying technology is

(Continued on Page 6)

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Special Projects	Jack B. Rochester
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Please address all correspondence to the appropriate department at Box 880, 375 Cochituate Road, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153.

OTHER EDITORIAL OFFICES & SALES OFFICES:

New York: Suite 7G, 401 East 80th St., New York, N.Y. 10021. Phone: (212) 570-2135

West Coast: 297 Lytton Ave., Palo Alto, Calif. 94301. Phone: (415) 328-8064.

Washington, D.C.: 880 National Press Building, 529 14th St. N.W., Washington, D.C. 20045. Phone: (202) 347-6718.

England: Bill Dunlop, Stephen Thomas, [illegible] Annex, 345 Caswell Rd., Islington, London EC1V [illegible] Phone 01278 3415/6

W. Germany: Eckhard Utpadel, CW Publikationen, [illegible] 31, 8000 Munich 40 Phone: (089) 36-08-61 Telex: 5215348

France: Patrick Morel, Le Monde Informatique, 42, Avenue Montaigne, 75008 Paris. Phone: 720.88.66

Japan: Mr. [illegible], Computerworld Japan, 7-4 Shinbashi 1-Chome, Chuo-ku, Tokyo 104 Phone: (03) [illegible] Telex 252-4217 [illegible] H. Yamada, Tokyo Representative Corp., Yamaguchi Bldg., 2-12 Kanda Jimbo-Cho, Chiyoda-Ku, Tokyo 101. Phone: (03) 230-0117. Telex [illegible]

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065 Phone: (02) 4398133. Telex SBCCO AA25468.

Brazil: [illegible] Higgens, Data News, Computerworld do Brasil, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25/10th Floor 20031 Rio de Janeiro, RJ Brazil Phone: (021) 240-8225 Telex 2130838 WORD BR

Mexico: Richard Small, Computerworld de Mexico, Oaxaca 20-2 Colonia Roma, Mexico City 7 D.F. Phone: (905) 514-4218, (905) 514-6309

Spain: Neil Gelber, Computerworld/Espana, [illegible], 13, Madrid 4 Phone 231-22-00 231-23-0 231-23-00 Telex c/o IDC [illegible] Madrid

Denmark: [illegible] Engell, Computerworld/Denmark, Gammel Strand 50, 1202 Copenhagen K Phone 01-1234-11 Telex 27000 [illegible]

Sweden: Bengt Marcelius, Computerworld/Sweden, Stora Media AB, Vartavagen 55, 11520 Stockholm

Italy: Daniele Comboni, Gruppo Editoriale Jackson, s.r.l., Via Rosellini 12, 20124 Milano

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ACLU Charges New Orleans, Jeff Parish With False Arrests From Computer Errors

By Jim Bartimo
CW Staff

NEW ORLEANS — The American Civil Liberties Union (ACLU) last month filed a class action suit charging the city of New Orleans and its police superintendent with the false arrest of several hundred people because of computer programming errors. Also named in the suit are Jefferson Parish, its sheriff and a number of unknown police officers and/or computer programmers.

But the New Orleans Police Department "acknowledges no false arrests," Calvin Galliano, assistant supervisor of the New Orleans police, said last week. A spokesman for Jefferson Parish could not be reached.

The ACLU's civil action asks the U.S. District Court of Eastern Louisiana to order the New Orleans Police Department and the Jefferson Parish Sheriff's Office to correct erroneous information contained in their computers.

The city of New Orleans and Jefferson Parish, which is a county adjacent to New Orleans, have separate but connected computer systems, according to Martha Kegel, executive director of the ACLU's Louisiana affiliate. Because the information in the computers is so often inaccurate, police officers assume the computer is "a little off" and make arrests of people whose descriptions only partially fit those of the suspect, she said.

"We're basically trying to get improvements in the training of people who operate the equipment," Kegel explained. But Galliano maintained that "our system provides adequate safeguards. We have good training and monitor our system well."

The New Orleans Police Department uses an IBM system that can transfer files of arrest with Jefferson Parish and City Hall, a city spokesman said. The ACLU has charged that inaccurate information is not removed from the files even when it is discovered.

The New Orleans police maintain, however, that outdated and inaccurate information is removed from the system. "We have adequate purge capabilities," Galliano said.

In addition, the ACLU's complaint stated, "Orleans and Jefferson parishes and their law enforcement personnel do not have clear and appropriate policies and procedures in place to program, manage and disseminate the information on their respective computers."

DP Check Lands Her in Jail

NEW ORLEANS — The official filing of the class action against New Orleans and Jefferson Parish says the suit is being brought by "Shirley Jones, individually, and on behalf of all others similarly situated."

Jones is reportedly a victim of alleged computer problems here. Booked twice in the past year and imprisoned once in Jefferson Parish, her first arrest came after a routine computer check by the state's Department of Health and Human Resources.

The computer check was performed so that Jones, a black mother of three, could accept into her home five nieces and nephews who would have otherwise been transferred elsewhere, according to the American Civil Liberties Union's (ACLU) legal complaint. The next day, Jones was arrested because her name was used as a pseudonym by Vera Davis, who was being sought on charges of theft and forgery since 1978.

Jones was imprisoned for 18 hours, the complaint stated, even though she was born on a different date, was six inches shorter and many pounds lighter than Jones. "However, the Jefferson Parish Sheriff's Office still contended she was the same person because their computer was always 'a little off,' " the complaint stated. Charges against Jones were dismissed in April 1982.

Even though information about Jones' two bookings had been entered into the computer, she was subpoenaed on the same charges last August. When she appeared at the Sheriff's Department to clear up the matter, she was again fingerprinted and advised to change her name to keep the same mistake from happening again, the complaint stated.

Martha Kegel, executive director of the ACLU's Louisiana affiliate, said the Jones case typifies the Police Department's computer problems. The police were so accustomed to inaccurate information that they assumed the computer was wrong and continued to arrest Jones despite incongruities between the computer description and Jones' description.

Moreover, a correction was never entered into the computer records, Kegel said.

This Week

IN DEPTH

The Personal Computing Library ....Follows Page 70
DP Resource Planning ID/11
Stop Documenting ID/19

NEWS

Predictions of DPer Shortages Came True 4
Financial Incentives Urged to Hike DP Output 5
Destroyed Data Center Up a Week Later 7
Suit May Imperil Voice Store-and-Forward 9
Los Angeles Police to Launch $42 Million System ..12
EEC Approaches IBM to Settle Antitrust Action ...13
Lack of Managerial Support Systems Lamented ...14
People, Not Tech, Seen Making MIS Winners 15
Users Group Proposals Often Adopted by NCR ...16
'Politics' Not a Dirty Word, Consultant Says 18
Three Steps to Effective Management Offered 19
DPers Told 'Tight Shop' No Longer Enough 21
Young to Speak at AIM Conference 22
Managers on the Move 23
Bank Goes In-House to Cut Processing Costs 24
Shipper Sails With System Upgrade 25
Firm Solves Space Problem With Dasd Tool 26
Mini Helps Shape Fashion Success 27
Tool Speeds Sales Forecasting for Firm 30
Records Manager Supports Utility's Growth 31
Builder Puts Credit Collection Faith in Software ...32
Firm Builds Up Profits With In-House System 33
Manufacturer Cleans Up With MRP System 36

EDITORIAL

Editorial: Bucking a Trend 40
Lecht on Science: A Robot for Baby 41
Human Connection: Cyberphobia Not Routine 41
Reader Commentary: Negotiate Clauses Early 44
Reader Commentary: Preparation for Contracts ...45

SOFTWARE & SERVICES

Modeling Aid Helps Oil Firm's Planning 49
MPG Announces Pricing Structure for Ramis II 50
Release 2.8 of Fastdasd Unveiled 51
Test Plan Standards Portfolio Released for DP 56
'Vakpak-Educator' Unveiled 58
Training Package Runs on IBM Micros, CPUs 60
European Economic Data Bases Available in U.S. ..61
Distribution System Runs on DG 62

COMMUNICATIONS

Convergent Aids Introduced 65
Tape System Boasts Error-Free Transmission 66
Z-29 Terminal Unveiled 70

SYSTEMS & PERIPHERALS

Lisp-Based Workstation Debuts From Symbolics ..71
Graphics Board for Mime Unveiled 72
Subsystems Released for Micros 82

OFFICE AUTOMATION

Workstation Line Targets 3278 Unit 83
Racal Telesystems Unveils Protocol Translators ...84

COMPUTER INDUSTRY

Tax Authorities Look to Software for Revenue 87
New England Beats Sun Belt in Salary Survey 87
Fujitsu to Buy TRW's Share in TFC Partnership ...88
Preliminary Ban Issued on Hubco MAI Upgrade ...92
Protectionism to Foster High Tech Seen Threat ...98
BEI Chief Found Guilty of Theft From Nixdorf 99
HP Group to Increase Business Micro Sales 100
Rolm Files Lawsuit Against Plessey 101

ADVERTISING INDEX 130

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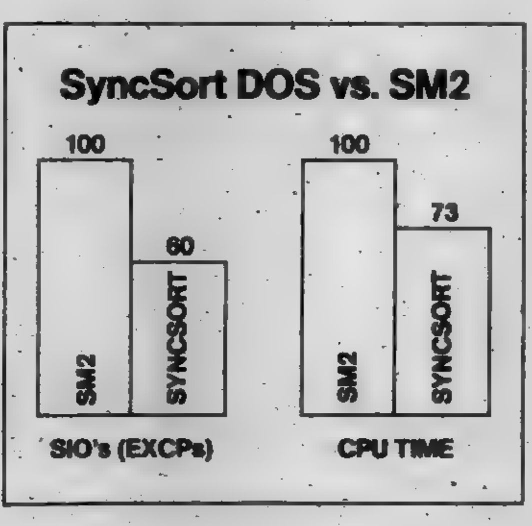

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Predictions of DPer Shortages Came True

20/20 HINDSIGHT

By Paul Gillin
CW Staff

Programmers who made career plans based on predictions that appeared in *Computerworld* three to four years ago made pretty safe bets. The forecasts are still generally valid, the people who made them said when they were contacted recently, even though their individual predictions were somewhat different.

Pundits who foretold a programmer shortage persisting into the next decade still stand by their predictions, although they said the recession has rendered them less dire. In October 1980, the National Science Foundation's (NSF) "Science and Engineering Education for the '80s and Beyond" projected that approximately 550,000 jobs for programmers, systems analysts and other computer professionals would open in the U.S. between 1978 and 1990. The supply of college graduates in those fields would be no more than 157,000 during those same years, the report predicted.

The availability of work has since led many students educated in other fields to enter computer work, according to Dr. Alphonse Buccino, deputy director for science education at the NSF and one of the report's authors. That, combined with the recessionary squeeze, has eased the shortages somewhat.

"The shortage is not quite as severe as the numbers indicate, but that doesn't mean there isn't a problem," Buccino maintained.

Software productivity tools have failed to alleviate the programmer shortfall, Buccino said. In fact, they may make it worse.

"It's like the jetliner, which not only met a need that was felt in 1958 but created its own demand," he said. "More and more individuals are finding applications."

Business has responded to some of the recommendations made in the 1980 report, Buccino said. Among those were suggestions that industry provide research facilities and offer sabbatical arrangements whereby industrial engineers and university faculty could exchange jobs to broaden their experience. The report also concluded that universities should allow faculty members more leeway to supplement their incomes.

"Private industry has taken an increased interest in educational institutions," Buccino said. In fact, the 14th annual report of the National Science Foundation is titled "University-Industry Research Relationships."

Application programmers will not be threatened by end-user-manipulated software, time-sharing and turnkey systems, said John K. Lady, chief of the Computer Services Division at the National Telecommunications and Information Administration in March 1979. Turnkeys will be oversold as solutions, Lady said at the time, and applications programmers will still be in demand for their specialized skills.

Application generators and high-level programming languages have transferred more development responsibility to end users in the intervening years. But Lady maintained that applications programmers are in no immediate danger.

"The job outlook for application programmers looks good for the rest of the decade," Lady said. "There is not yet any general-purpose software," that threatens specialized applications.

Time-sharing has become a valuable tool in specialized areas, Lady said, but it still poses no major threat to the general programmer. As for application development tools, their impact has been limited. "I haven't seen any programmer productivity tools that are very good," he said.

Lady now predicts that programmers will need to emphasize their analytical ability over coding skills. "They will work with new packages such as data base management systems, file-access utilities and report writers," he said. "Application programmers will still be needed to look at specific jobs and take advantage of all the tools that are available."

More Pessimistic Forecast

A less optimistic forecast was expressed in a Dec. 10, 1979 reader commentary. Michele Landon, then a technical supervisor of the Hartford Insurance Group and now manager of an application group at the University of Massachusetts at Amherst, asked, "Will we [programmers] go down in history as the profession that created and destroyed itself in 25 years?"

Landon said application generators and nonprocedural languages would create a trend that "will unfortunately but unavoidably eliminate programmers."

Perhaps the 25-year time frame was too short, Landon said recently, but programmers are still threatened by these tools. Rather than losing their jobs, she said, the programmer's role will change.

"Everyday application programmers will eventually lose a lot of their importance," she said. "Their role will be as consultants — teaching people how to use packages, minicomputers and micros."

Landon contradicted recent forecasts that predict that programming aids will actually increase the demand for new applications. Users will eventually take over most of their own development needs, she maintained. "Programmers still have to get more diversified. Those that are not technically oriented will have to learn to communicate."

N.Y. Recruiters Say Job Market Loosening Up

By Bob Johnson
CW New York Bureau

NEW YORK — If the New York metropolitan area is any barometer of economic conditions, then the back of the recession has been broken and the outlook for data processing positions in the near future is good.

DP personnel recruiters here report that positions in nearly all computer-related areas are becoming more plentiful as 1983 progresses. And salary offerings are increasing as well.

Although the DP job market in New York did not suffer as badly from the recession as did other areas of the country and other industries, the fact is that many positions that which would have been filled in better times were left open, according to William Borrelli, president of the recruiting firm William Harris Associates here.

The situation is changing, Borrelli maintained, adding that the DP job market is "loosening up." According to Borrelli, "Companies are coming to realize that they should fill those positions which were left vacant six months to a year ago. Prior to what is happening now, many firms maintained plans to hold back on new hiring unless it was extremely necessary. I have seen over the last three months companies now filling jobs that were open since the beginning of the last quarter of 1982."

Borrelli, who has been in the DP job market for 15 years, said he is witnessing "active interviewing and hiring" in positions that span all areas of DP. Specifically, he has detected a noticeable upswing in the number of placements and inquiries from DP technicians, especially from those outside the New York area. He attributed this interest to the poor economic situations that persist in other parts of the country.

"I've gotten a tremendous response from other parts of the U.S. DPers feel that because there is such a large concentration of users here, a proportionate amount of jobs will be available. And in some cases, it's beginning to happen again," he said.

Borrelli also pointed out that salaries at all levels of DP are on the increase. He said that in software support, for example, someone with about seven years of experience who is currently earning $42,000 can expect his market value to be worth in the $50,000-a-year range now.

Robert Half, president of Robert Half International, Inc., said there has been definite growth in the number of "orders" his company has taken for DP jobs within just the past two months.

Bonnie Kaplan, a placement manager for Robert Half in New York, said that although there has not been a "dramatic" change in the number of available jobs since 1982, there has certainly been an "upturn."

Kaplan noted that companies are beginning to replace vacated positions and are also expanding their DP operations as "more and multiple" positions become available.

"One positive indicator is the interview procedure," Kaplan maintained. She pointed out that clients are currently taking less time for the hiring process. "What took 3½ weeks to finalize in 1981 takes 2½ weeks now," she said.

Low Point

Steve Joffe, the manager for Source EDP here, said many New York-based companies are now at a "low point" in DP staffing because the metropolitan area was hit by the recession in the spring of 1982, a bit later than the rest of the country. Joffe said that the job market is indeed becoming stronger and that economic indicators, such as the steady positive actions in the stock market, are giving companies the confidence that recovery is "real."

This confidence, coupled with a need for good DPers, is evidently spurring companies to hire once again, Joffe noted. "We hit the worst, and we are now coming back. The worst time for us was the last quarter of 1982, but now things are turning around. I can't quantify it right now. It's just a feeling — but companies are definitely expressing a need for DPers again," he stated.

Opening fastest are positions in the highly technical areas, Joffe said. By and large, however, Source EDP here is seeing a "much greater diversity of positions" than it has in the recent past, he added. Management jobs will also open up strongly again, Joffe predicted, but these high-level spots traditionally take longer to open because they are usually related to a DP expansion situation.

Joffe also said that until recently, many DPers were reluctant to seek new jobs, even if they were dissatisfied with their present positions, because few companies were able to offer good DP positions during the recession. Now, Joffe is seeing an influx of both job applicants and openings in numbers that he described as having "never been so great." According to Joffe, "There won't be a running inflation of jobs, but it will be better and better."

Bruce Neuman, president of the recruiting firm Fairon-Rambeau, called the current job situation "tremendous." He said that companies are opening up jobs "like crazy," chiefly because of the stock market's five-month high and other positive economic indicators.

Financial Incentives Urged to Hike DP Output

By Tom Henkel
CW Staff

Financial incentive programs similar to those used to reward top corporate executives can boost productivity dramatically in the DP department, according to Dr. Howard A. Rubin, a computer science professor at City University of New York's Hunter College who also runs a productivity consulting business based in Stamford, Conn. Most effective are incentive programs that offer DPers at least $500 to $600 a year in bonuses.

When financial incentive programs are accompanied by other productivity tools, such as hardware and software enhancements, DPers can potentially produce seven times more work, he claimed.

Rubin, however, warned that while financial incentives can be beneficial, they cannot compensate for poor management or unpleasant working conditions.

Behavior modification is the key to motivating the DP staff, Rubin maintained. An incentive program that rewards the entire staff, typically twice a year, for their combined performance promotes a team effort that puts pressure on each employee to produce more. That approach is more effective than the competitive approach of rewarding only top producers, Rubin contended in a recent interview.

"You will have high achievers in every organization. This plan is aimed at the average and below-average employees," he explained.

Moreover, the researcher said, the financial incentive program also appears to help DP managers retain new entry-level employees, who traditionally job-hop to boost their salaries.

Ideally, employee bonuses should range between 2% and 10% of the employees' average salary, Rubin noted. However, they should not exceed 10% of the employees' salaries. Past the 10% mark, the incentive program becomes less advantageous to the company, he said.

Paying attention to the people costs in the DP department offers pay back that is higher than any productivity tool on the market, Rubin continued. Many firms make the mistake of buying hardware and software that are billed as productivity boosters. If managers fail to consider the staff's attitude as an element in the productivity equation, those products often fail to live up to their full potential, Rubin said.

Measuring Productivity

But measuring an employee's productivity is not an easy task. Improved productivity, Rubin explained, occurs when the DP department is providing better service to its customers — the in-house departments that depend on the DP department to provide information and services. The real measure of productivity entails meeting deadlines and providing quality software in a more cost-effective way, Rubin said.

Aside from cutting costs and improving service, incentives help managers understand what the information services department actually does.

"Measurement by itself does not supply the motivation for productivity improvement. By analogy, an overweight individual may weigh himself every day, but not take any action," Rubin said.

"I don't believe financial incentives alone can tap all 400%," Rubin said, referring to the percentage which he thinks employees are capable of increasing their performance if motivated properly.

How to Rate Productivity?

How can the information systems manager rate employee productivity? According to Dr. Howard A. Rubin, the best performance measurement technique is partly mathematical and partly common sense.

Productivity is a combination of lowering the unit cost of products (information services and applications in this case) and maintaining an acceptable quality level and delivery schedule, Rubin explained.

Rubin contended that DP employees should be rewarded according to how well they perform as a group. That translates into a bonus for each employee in the DP department equal to the group's performance times its improvement over last year.

The departmentwide performance rating can be quantified as a number between zero and one, Rubin said. For example, if the DP staff produced 75% of its work load within 10% of the company's standards for quality and timeliness, the employees would receive a zero rating. If they managed to produce 85% of their work within 10% of company standards, they would receive a .5 rating. The top rating would go to the DP staff that produces 95% of its work and still remains within the 10% standard.

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Large Users Plan to Bypass Phone Companies

(Continued from Page 1)

Commission predicted that it will take three to five years for bypass vendors to become credible competitors of the telephone company. One reason: skepticism among prospective users.

"A number of respondents expressed doubts about the ruggedness and reliability of proposed local bypass systems," the FCC said, while others contended that "much of the current rush to local bypass was the result of unwarranted claims."

Despite its stance on user skepticism, the status report listed some 40 corporate and institutional telecommunications users that have installed or plan to install bypass facilities. Twenty-five of those organizations have systems already in place or will begin construction within a year.

Moreover, the report pointed out that a relatively few business and institutional telecommunications users account for a relatively large share of telephone company revenues: "AT&T claims that 5% of its customers generate 63% of its revenues." An even more dramatic example is provided by New York Telephone Co.; "more than one-third" of New York Telephone's revenues are generated by one-third of 1% of its customers, all of whom are located in Manhattan.

It is probably not accidental that Merrill Lynch & Co., in collaboration with the Greater New York Port Authority and Western Union, Inc., is now building a fiber-optic-based bypass network connecting the lower Manhattan business district with several neighboring business districts and with a "teleport" on Staten Island, where a number of private and public satellite earth stations are under construction. The New York teleport network will have a 96-fiber backbone trunk able to carry 200M bits per second on each fiber.

New York is also the place where Manhattan Cable TV Co., in competition with the telephone company, has been transmitting two-way voice and data signals for several years among business locations.

According to Dr. Jerone Lucas, president of Telestrategies, Inc., a McLean, Va.-based consulting firm that follows bypass closely, about 10 other cities are now planning teleports, and two — Columbus, Ohio, and Dallas — have teleports under construction. Meanwhile, an Atlanta cable TV network is providing local distribution for Isacomm, Inc., a reseller of satellite communications services, and in Omaha, Neb., Cox Cable TV is doing likewise for MCI Communications Corp.

At least 10 of the nation's 30 largest cities now have two-way cable TV systems in place or under construction, Lucas said, noting that the operators in Nashville, Tenn., Portland, Ore., and Dallas are promoting their channels to telecommunications users.

Lucas believes several cities will have bypass facilities up and operating before the end of next year. Aside from cable TV, there will be data-only digital termination systems, voice-only celllular mobile radio, plus private microwave and optical fiber point-to-point links that handle both kinds of traffic, he predicted, adding that by the end of 1984, there should be enough systems and users "to make bypass credible."

Will New Access Charge Plan Encourage Users to Bypass?

By Phil Hirsch
CW Washington Bureau

One question raised by the Federal Communications Commission's (FCC) new access charge plan [CW, March 7] is whether it will encourage users to bypass their local telephone company networks. The question is pertinent because many business telecommunications users, especially the larger ones, are seriously considering bypass alternatives, and a number of bypass vendors have begun hawking their wares.

The FCC plan drastically alters the way end users of the long-distance telephone network pay for access to that network. This could have a significant impact on the future viability of bypass services.

However, the present version of the access charge plan is not necessarily the final one. The National Association of Regulatory Utility Commissions has already taken the decision to court, and others may do likewise.

What does the new access charge plan mean? Today, part of what each interstate carrier collects from a user is given to the local telephone company to reimburse it for providing access facilities — terminal equipment (if leased from the telephone company), inside and outside wiring and a portion of the switch that terminates the user's local loop.

Beginning next Jan. 1, however, the user will pay much of the charge for these facilities directly to the telephone company. Or, more accurately, he will pay most of the Non-Traffic-Sensitive (NTS) charges allocated to local telephone company-provided long-distance access facilities. In 1984, the total bill for these charges will be about $8.5 billion per month, or roughly $8.50 per line monthly, the FCC said.

Initially, business users will pay an additional monthly charge of at least $4 per line to reimburse local telephone companies for providing access to long-distance circuits. The remainder of the reimbursement will be paid in 1984 by the interstate carriers, but over the succeeding five years, it will be added gradually to the direct charge levied on the end user.

Analysis

Those hit hardest by the increase may be users with heavy traffic loads. Not only do they have more lines, but they also tend to employ dedicated rather than dial-up access circuits. Users of the former facilities are now paying far less than users of the latter for interstate network access, the FCC said, because the telephone industry's present cost allocation scheme, which was established by the carriers rather than the FCC assigned virtually all of the access costs to switched offerings such as Message Toll Service/Wide Area Telecommunications Service (MTS/Wats).

Under the FCC's new plan, however, all business users who lease lines from the phone company will pay a minimum flat rate charge of $4 per line per month (residential users will pay at least $2 per line per month).

All of this suggests that there will be growing interest in alternate facilities that bypass the local exchange network (and the $4 rate hike). However, the shift of local access charges from the interstate carriers to their customers may cause a compensating reduction in interstate message charges.

The FCC expects this to happen; it pointed out in the recent order that heavy users will find message rates "dramatically reduced," which it said will make bypass "a less desirable option."

Even if the decline in interstate rates does not completely offset the increase in local exchange rates, users will not necessarily migrate en masse to bypass services. For, as the FCC pointed out in a "Status Report on Near-Term Local Developments," users considering bypass weigh a number of factors before deciding.

AT&T Offers TDC Service For Voice, Data, Facsimile

WASHINGTON, D.C. — AT&T has begun offering wideband Terrestrial Digital Circuits Service (TDC), which was authorized by the Federal Communications Commission last week despite objections from phone company competitors.

TDC, a 1.5M bit/sec point-to-point service for high-volume business and government communications users, replaces the 1.5M bit/sec portion of Dataphone Digital Service (DDS). TDC circuits can carry voice, data and facsimile transmissions.

The new service "can be particularly useful to large business customers who have their own private-line telecommunications networks and who need a mixture of voice and data transmission channels," a spokesman for AT&T said.

"It also can be used to provide access lines to AT&T's high-speed switched digital service, which is used to provide video teleconferencing and data transmission."

The TDC tariff approved by the FCC last week establishes new rates for 1.5M bit/sec service, increasing rates for shorter circuits up to about 100 miles and lowering long-haul rates. For example, a short-haul customer that paid $2,180/mo for a 30-mile circuit will now be charged $2,855; a long-haul customer that paid $62,075/mo for an 800-mile circuit will pay $26,285.

AT&T had delayed the effective date of TDC (see earlier story on Page 18) because of objections from competitors, who are chiefly upset about a requirement of the TDC tariff that all terminals connected to TDC channels must utilize network channel terminating equipment (NCTE) obtainable solely from the phone company.

AT&T Agrees to License Videotex Patent

(Continued from Page 1)

the subject of a patent application filed by AT&T's Western Electric [CW, Feb. 21]. Ansi rules allow patented technology to be standardized, but only if the patent owner agrees to license the patent to others on reasonable terms.

AT&T had agreed in general to do this but had balked at making a written commitment until assured by the U.S. Patent Office that it had a valid patent claim, a process that would take several months.

Tom Hastings, chairman of X3L2, said his group had to have the commitment before May 21 or work on NAPLPS would be delayed. It now appears that X3L2 will be able to complete a draft NAPLPS standard by the end of May, its original objective. This draft will then have to be considered by higher level Ansi groups before being adopted, a process that will take several months more.

Not every one agrees that AT&T's refusal to state its licensing terms immediately and in writing was based on uncertainty about the patent claim. Some think American Bell, Inc., which is in charge of marketing AT&T's videotex products, was trying to frustrate competitors.

"AT&T knows that its comeptitors won't make a significant investment in NAPLPS until they are sure they won't have to pay an arm and a leg for use of the technology," Bill Frezza said last month. Frezza heads a team at General Instrument Corp.'s Jerrold Division, which is developing an NAPLPS-compatible terminal family.

Canada also has a big stake in NAPLPS, since the proposed Ansi standard is based largely on Telidon, a videotex display system developed and promoted by the Canadian government at a cost of several million dollars.

Storm Demolishes IBM 4341

Destroyed Data Center Up A Week Later

By Jeffry Beeler
CW West Coast Bureau

COMPTON, Calif. — A Japanese automaker temporarily lost one of its two U.S. data centers late last month when a roof collapsed during a fierce Pacific storm and smashed the firm's entire hardware configuration into scrap metal.

The cave-in sent 10,000 gallons of flood water and five tons of air-conditioning equipment crashing down on an IBM 4341-based system owned and operated by Mazda Motors Corp. of America.

Although it caused no deaths or injuries, the Feb. 27 disaster did bring to an abrupt standstill a data center that supplies all Mazda's central computing services in 31 states.

For roughly a week, the wrecked and rain-soaked installation remained totally idle while Mazda's end users in the field reverted to manual methods of doing their major applications.

But by March 3, just four days after the cave-in, the company had already begun transferring its shattered central computing operations to a makeshift data center situated just 60 feet from the site of last month's devastation. Four days later still, the firm had regained all its former information processing capabilities and had returned to business as usual, according to Mazda's vice-president of DP, Harry Linnell.

Credit for the automaker's speedy disaster recovery goes partly to a local specialty construction firm known as Computer Facilities, Inc., Linnell said. Between Feb. 28 and March 3, Computer Facilities transformed 1,500 square feet of Mazda's conventional business office space into a fully operational DP room, complete with raised floors, air conditioning and all the other physical prerequisites of modern computing.

Linnell also credits the rapid restoration of his company's information processing facilities to a Sherman Oaks, Calif.-based hardware dealer known as El Camino Resources Ltd. For more than 48 hours beginning on March 1, the El Camino dealer combed the entire continental U.S. in an effort to find replacements for the 16 major pieces of IBM hardware that were demolished during the Feb. 27 roof collapse.

By March 3, all the necessary replacement equipment had been found and bought, shipped from six major locations throughout the U.S. and arrived at Mazda's makeshift data center here in Southern California, Linnell said.

Backup Saved Data

A third factor contributing to Mazda's quick disaster recovery was the company's own policy of maintaining both on- and off-site backup copies of all its key files. Although all the firm's IBM 3330, 3350 and 3380 disk systems were soaked and flattened beyond repair, the automaker escaped the calamity without losing even a shred of its business data, Linnell said.

The reason is that Mazda routinely duplicates its critical files on backup disk packs and then stores the extra copies in a concrete vault housed in the same building as the data center. Both the vault and its contents survived the roof cave-in intact. "If we hadn't taken the precaution to create backups, I'd probably be out there now looking for another job," Linnell said.

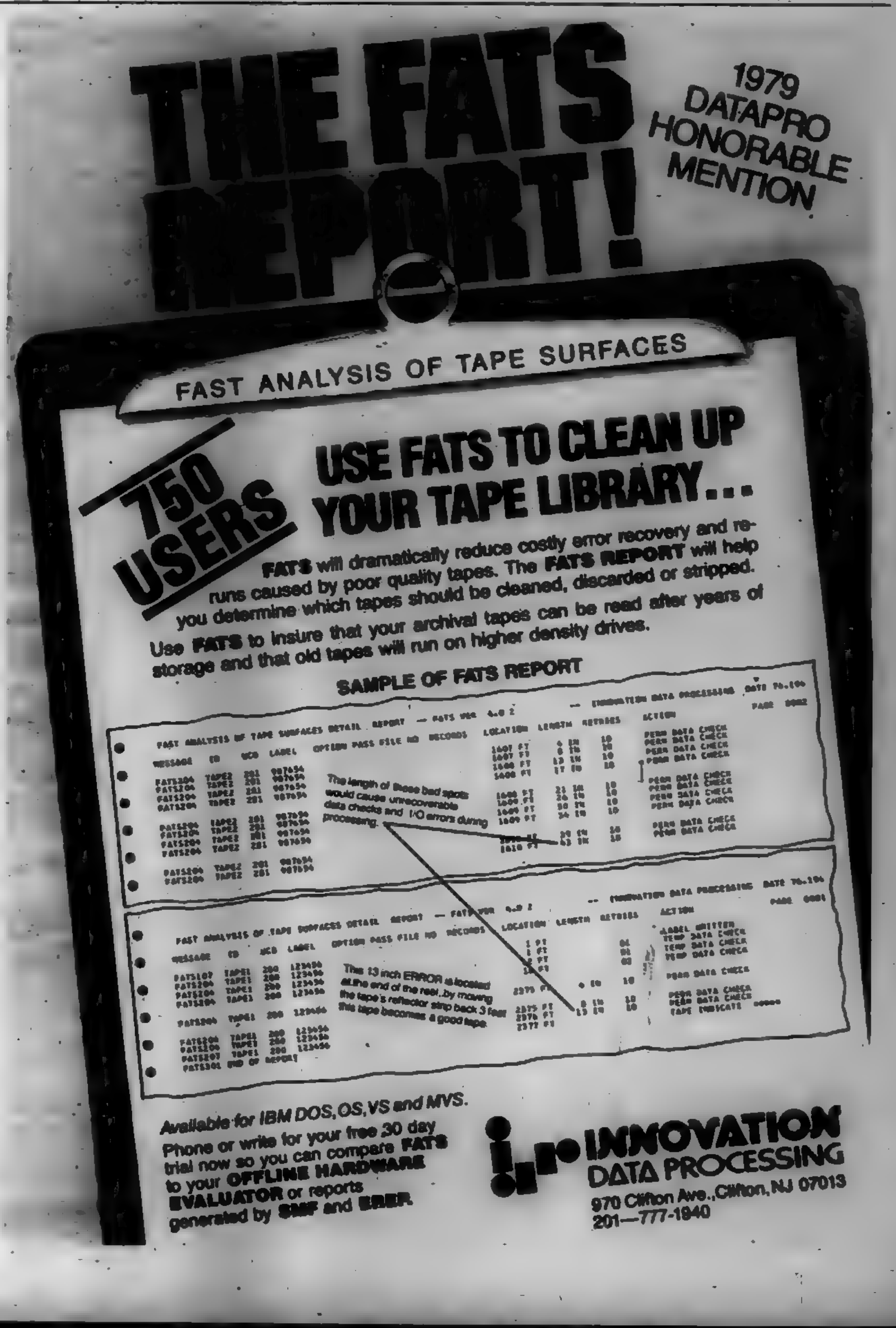
All in all, Mazda seems to have emerged from the recent destruction of its data center with comparatively few scars. During the week when its central computing facilities were entirely out of commission, the firm's manual backup procedures were reportedly able to maintain all the organization's key business activities at a near-normal level of performance.

"But if the interruption of our central processing operations had continued for longer than a week, we would probably have begun to see a slowdown in the delivery of new vehicles to our dealer showrooms," Linnell conceded.

Built around a 4M-byte IBM 4341-L2 running VSE, Mazda's West Coast data center here serves as the hub of a far-flung telecommunications network encompassing four parts depots, five ports and 400 dealers in 31 states. Like the automaker's other U.S. data center on the East Coast, the Los Angeles area installation controls inventory, allocates vehicles, monitors parts distribution and processes warranties for all the users within its assigned region.

For the most part, the western data center and its IBM 3705-based telecommunications network operate uneventfully. But late last month, serious trouble developed when a storm drain on the facility's roof became clogged with debris and buckled under the water's weight during one of Southern California's heaviest recorded rainfalls.

In addition to bombarding the hardware below with two 5,000-lb air-conditioning condensers and a tidal wave of accumulated rainfall, the cave-in left a 20-ft by 45-ft hole in the center's roof.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Desktop Mainframe Built With 32-Bit VLSI Chip Set

(Continued from Page 1)

Besides the 9300 introduction, NCR also announced it is adding a "specialized sales force" to its U.S. marketing organization that will deal exclusively with large organizations and institutions.

The 9300 reportedly can run all programs written for the company's I-Series systems. The miniature mainframe can also communicate with the company's recently introduced Decision Mate series of microcomputers through the firm's Decision Net local-area network, a spokesman said.

NCR attributed the 9300's 7½- by 17½- by 25¾-in. size in large part to the first-time use of its NCR/32 chip set. The dime-size central processor chip, which contains over 70,000 transistors, has the same electronics contained on 10 11-in. by 14-in. boards used in the firm's I-9020 series.

The three other boards comprising the chip set contain an address translation chip and two systems interface chips that would allow other manufacturers to integrate the chip set into their own systems.

In addition to reducing the system's size, the chip set is also responsible for making the system 10 times more reliable and requiring 90% less power than mainframes in the I-Series, the spokesman for NCR maintained. He also attributed the system's microinstruction execution time of 150 nsec and its virtual memory fetch cycle time of 600 nsec to the chip set.

At $24,235, the entry-level 9300 consists of the NCR/32 chip set, 1M byte of memory, a Link Level Communication Subsystem that supports seven asynchronous communications lines, four I/O subsystems for peripheral attachment, microcode and system utilities.

The bread box-sized NCR 9300 plugs into a standard 120V outlet, does not require heavy-duty wiring and needs no special air conditioning or humidity controls, NCR claimed.

Also included in the base price is the newly announced Interactive Transaction Executive (ITX) operating system, which NCR claimed provides a new way of linking transaction-based high- and low-order processing. The operating system permits industrial, retail and financial terminals to swap information with each other, according to the spokesman.

Because the 9300 is expected to play an important role in NCR's distributed data processing strategy, the vendor has equipped the mainframe with communications interfaces for IBM's Systems Network Architecture/Systems Data Link Control, IBM's Binary Synchronous Communications and X.25.

The company has developed a proprietary memory scrubber that scours the chip set's 4M bytes of processor memory every 16 seconds. The memory scrubber "virtually eliminates" the possibility of double-bit errors by correcting any transient single-bit errors automatically without involving the CPU, the spokesman said.

By adding an optional computational chip to the basic chip set, the 9300 might also be used for scientific applications, the company noted.

The 9300 can be leased for $950/mo on a three-year plan, the vendor said from 1700 S. Patterson Blvd., Dayton, Ohio 45479.

Commerce Report Says U.S. in Trouble

(Continued from Page 1)

country. Summarizing the findings of its study, which singled out nine separate industries, Commerce said that:

- High-technology industries are vital to the U.S. economy for a number of reasons, particularly in that they provide productivity improvements that are essential to a rising standard of living.
- National security depends upon the technology-intensive industries, both for sophisticated items that are essential to modern weapons superiority and for a strong and flexible industrial capability for future contingencies.
- The U.S. must rely on its strongest industrial sectors, for instance high technology, to meet increased competition in world markets.
- Over the last 12 years there has been a decline in the international market position of U.S. high-technology industries from a position of dominance to one of being strongly challenged. Market share for the high-technology group and for nearly all individual industries has fallen.
- If present trends continue, the U.S. can expect a further decline in the competitive position of U.S. high-technology industries.
- Foreign government industrial programs, particularly industry targeting, have adversely affected U.S. high-technology industries and will, if trends continue, place U.S. business at a disadvantage, even with an ideal environment for high technology within the U.S.
- The major technological challenge to the U.S. is from Japan. Now limited to a few high-technology sectors, this challenge can be expected to broaden in the future.

"The United States maintains an absolute lead in overall technology," the report noted.

The study added, however, that "there has been a decline relative to our major competitors in a significant number of U.S. high-technology industries."

Turning to the computer hardware and software, semiconductor, fiber optics and robotics industries in detail, Commerce reported that in a number of industry areas the U.S. has been surpassed or nearly equaled by the technological advances of Japan.

Development Risks

In discussing the environment for technological development, Commerce concluded that U.S. high-technology firms in some cases face higher capital costs and face more risks because they lack the government support found in other countries and because they have less favorable access to funds than their competitors in other countries such as France and Japan.

In terms of research and development spending, the report noted that, overall, the U.S. has larger outlays than West Germany, Japan and France.

But, according to Commerce, those nations are raising their R&D financing, and U.S. government spending increasingly goes for military projects, whereas most foreign government-sponsored R&D "focuses on areas of potential commercial significance."

The study also noted that those same competing nations are, on a percentage basis, increasing the numbers of scientific and technical personnel at a greater rate than the U.S, where the situation is worsening because of "a noticeable 'graying' of America's engineering work forces" and because of the fact that high private-sector salaries rob the universities of the faculty needed to train the next generation of high-technology workers.

Congressional Resolutions Mark Sharansky's Sixth Year in Prison

WASHINGTON, D.C. — Last Tuesday marked the sixth anniversary of the arrest and imprisonment of Anatoly Shcharansky, a Russian computer scientist and leader of a Moscow human rights movement who was charged with spying for the U.S.

The occasion was marked here by Congressional resolutions directing the White House and State Department to work toward Shcharansky's release and emmigration to join his wife in Israel. More than 200 congressmen and senators have co-sponsored the resolutions.

Arrested March 15, 1977 and accused of spying for the Central Intelligence Agency and with spreading anti-Soviet propaganda, Shcharansky was sentenced to 13 years in prison and hard labor. The guilty verdict was returned on what the resolutions termed "trumped up charges," despite a statement from President Carter denying that Shcharansky was an American agent.

Since then, according to information reaching the West from his family, the computer scientist's health has deteriorated. In addition he staged a hunger strike from September 24, 1982 until January 14 of this year protesting the Soviet authorities' refusal to allow him family visits.

The House resolution, which cites Shcharansky's "harsh treatment, including isolation, severe cold and inadequate food," mirrors the companion Senate measure in calling for the president and Secretary of State to press the Soviets to release Shcharansky and to deliver the resolutions to the Soviet ambassador.

Corrections

In "File-Aid, Abend-Aid Out" [CW, Feb. 21], it was incorrectly reported that Compuware Corp.'s File-Aid runs under DOS. The product is available only under OS.

The price listed for IO Corp.'s new interface, the IO 901A [CW Feb. 28], should have been listed as $3,995. Also, the IO 901A is interfacing a 2,400 bit/sec bisynchronous line to a 1,200 bit/sec asynchronous line, not 24K to 12K bit/sec as was published.

Prime to Skip NCC This Year

NATICK, Mass. — Prime Computer, Inc. will not be at the National Computer Conference when it opens May 16 in Anaheim, Calif. The company "took a real hard look at [its] trade show strategy and decided to stay home" from NCC, a spokeswoman explained last week.

Prime will instead concentrate its trade show efforts and money on more focused shows, such as those pertaining to office automation and computer-aided design and manufacturing, she said.

Prime denied that dropping out of NCC had anything to do with corporate budget tightening. "We'll spend as much as before, just in different areas," the spokeswoman said. "The generic trade show just isn't worth it."

The firms that dropped out of NCC last year included Hewlett-Packard Co., Pansophic Systems, Inc. and Chromatics, Inc.

Suit Could Imperil Future Of Voice Store-and-Forward

BOSTON — The future of voice store-and-forward systems made by Wang Laboratories, Inc., IBM and Rolm Corp. may be in jeopardy if a "test case" lawsuit filed by VMX, Inc. against Commterm, Inc. is successful.

The legal complaint asks that Commterm suspend marketing of its voice store-and-forward system because it violates VMX's newly awarded patent. The suit also asks that an assessment of damages be made to award VMX (formerly ECS Telecommunications, Inc.) an as yet undetermined sum of money. The sum is likely to be based on a "reasonable royalty," according to VMX's patent attorney, Jerry Mills of Baker, Miller, Mills & Murray, a Dallas law firm.

VMX and Commterm sources said the two firms are currently negotiating out of court. "If they don't come to an agreement, Commterm will go to court to protect its position," said Bob Murray, Commterm's director of marketing. "It is our hope that it can be settled without going to court."

If negotiations fail and VMX is successful in its legal action, Commterm's voice store-and-forward system could be forced off the market. But Murray maintained that Commterm's current users will not be penalized if this comes to pass.

While Mills had no comment about future action against manufacturers of voice store-and-forward systems, VMX Marketing Director Jeff Jenest said that if the suit against Commterm is successful, suits seeking to remove other systems from the market are likely. "You could call this a test case," Jenest said.

VMX filed the suit only 15 days after receiving broad patent rights on Feb. 1 to 51 individual design facets of its voice store-and-forward system. VMX filed for the patent in November 1979.

"There are 51 claims in the patent," according to Mills. "A claim is a one-sentence definition of what that patent covers. It's possible to sue on one claim or all 51. We're suing Commterm on all 51."

In related news, Commterm signed a marketing agreement with the UK telecommunications firm Plessey Company, Ltd. to provide a voice messaging system for Plessey's private branch exchange (PBX). Plessey has been sued by Rolm Corp. on copyright infringement and other charges (story on Page 101).

Commterm has a similar marketing agreement with Anaconda-Ericsson, and "we are close to announcing an OEM agreement with another major PBX manufacturer," a Commterm spokesman said.

RCA Customers to Get $28 Million Rebate

WASHINGTON, D.C. — Twenty-eight million dollars will shortly be distributed to RCA Global Communications, Inc.'s international telex and leased channel customers under a plan accepted by the Federal Communications Commission (FCC) earlier this month.

The commission decided in 1979 that Communications Satellite Corp. had charged RCA and other U.S. international record carriers (IRC) too much for service. It ruled that the resulting overcharges collected by the IRCs from their customers should be paid back to those customers.

However, objections from the biggest single user, the U.S. Department of Defense, delayed distribution of the overcharges due RCA customers.

The plan accepted by the FCC last week provides that 45% of the total will be paid to RCA's leased channel users and the remaining 55% to its telex customers. DOD will receive "over $3 million."

The disbursement will occur "within the next 60 days," a source at RCA said.

FCC Issues Interpretation Of Computer II Ruling

WASHINGTON, D.C. — Computer-based services that facilitate "basic" communications offerings can be provided directly by AT&T operating companies without violating the Second Computer Inquiry Decision, the Federal Communications Commission (FCC) ruled earlier this month. The ruling was the latest in a continuing series of interpretations of the "separate subsidiary" rule which, according to many critics, is gradually erasing the rule.

The latest Computer II interpretation arose from a complaint filed last year by Datapoint Corp. on AT&T's new Mechanized Credit Card Service (MCCS). The service enables credit card holders to make operatorless long-distance calls by punching their credit card numbers into Touch-Tone telephone keypads.

According to Datapoint, "MCCS is clearly an enhanced service" because it "requires information inputs and performs functions far beyond those required to establish a mere transmission path."

According to a recently released FCC statement, however, "MCCS . . . does not change the nature of the service, but merely facilitates its use."

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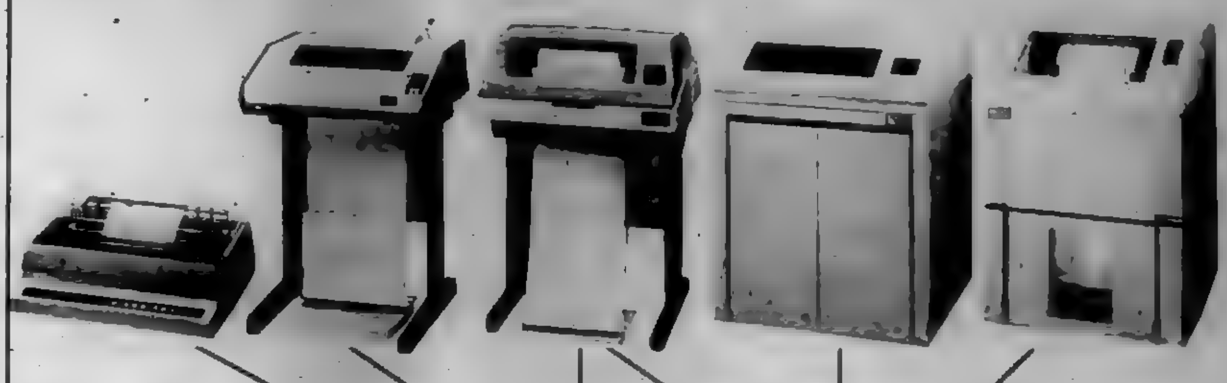

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3274 (type A), 3276	✓	✓	✓	✓			IPI-76
2780/3780 SYNC	✓	✓	✓	✓			CXI-10
3270 ASYNC	✓	✓	✓	✓			CXI-10
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VENDOR	SERVICE	DIGITAL/ ANALOG	COVERAGE AREA	NUMBER OF USERS	SPEEDS	MODES/ PROTOCOLS SUPPORTED	RATE ELEMENTS
AT&T	Dataphone Digital Service	Digital	400 Cities	Not Available	2,400 Bit/Sec 4,800 Bit/Sec 9,600 Bit/Sec 56K Bit/Sec	Synchronous, Full-Duplex, Half-Duplex	Mileage-Sensitive, Local Termination Charge, One-Time Installation Charge
United States Transmission Systems	Private Line	Analog	23 Cities	Not Available	Up to 9,600 Bit/Sec	Asynchronous, Synchronous, Half- and Full-Duplex	Mileage-Sensitive, One-Time Installation Charge
Tymnet, Inc.	Tymnet	Digital/Analog	280 Cities 36 Countries	Not Available	2,400 Bit/Sec 4,800 Bit/Sec 9,600 Bit/Sec	Asynchronous, Synchronous, X.25, IBM 3270 Binary Synchronous Communications	Host Interface Charge, Customer Account Charge, Character Transmission Charge, Terminal Interface Charge
GTE Telenet Communications Corp.	Telenet	Digital/Analog	250 Cities 40 Countries	800 Customer Organizations	110 to 1,200 Bit/Sec 2,400 Bit/Sec 4,800 Bit/Sec 9,600 Bit/Sec 56K Bit/Sec	Asynchronous, Synchronous, IBM 3270, 2780/3780, X.25, Half- and Full-Duplex, TWX, Telex	Monthly Charge, Installation Charge, Host Interface Charge, Character Transmission Charge
RCA	Cylix	Digital/Analog	300 Cities	107 Customer Organizations	4,800 Bit/Sec 9,600 Bit/Sec 56K Bit/Sec	Synchronous, Full-Duplex, Burroughs Corp. Polled Select, IBM 3270 Binary Synchronous Communications, IBM Synchronous Data Link Control	Character Transmission Charge, Monthly Charge, Installation Charge, Host Connection Charge
Compuserve	Network Services	Digital/Analog	200 Cities	Not Available	110 to 1,200 Bit/Sec	Asynchronous, Full-Duplex	Character Transmission Charge, Host Connection Charge, Monthly Charge, Installation Charge
Western Union	Private Line	Analog	47 Cities	Not Available	0 to 300 Bit/Sec 2,400 Bit/Sec 4,800 Bit/Sec 9,600 Bit/Sec	Synchronous, Full-Duplex	Mileage-Sensitive, Station Termination Charge, Line Conditioning Charge, "Pass-Through" Charge to Cities off the Network
American Satellite Co.	Specialized Network Services	Digital/Analog	27 Cities	250 Customer Organizations	9,600 Bit/Sec 56K Bit/Sec 1.5M Bit/Sec	Synchronous, Half- and Full-Duplex	Monthly Mileage Charge
Satellite Business Systems	Private Network Services	Digital/Analog	Nationwide Custom Networks	20 to 30	2,400 to 1.5M Bit/Sec	Depends on Network Configuration	Depends on Number of Earth Stations and User Locations
American Bell, Inc. Advanced Information Systems Division	AIS/Net 1000	Digital/Analog	17 Cities	Network Still in Beta Test	0 to 300 Bit/Sec 1,200 Bit/Sec 1,800 Bit/Sec 2,400 Bit/Sec 4,800 Bit/Sec 9,600 Bit/Sec		Host Interface Charge, Volume Transmission Charge, Monthly Charge, Installation Charge

A Sampling of Long-Distance Common Carriers With Data Transmission Services

Product Spotlight

One hundred long-distance common carriers were tariffed as of August 1982, according to the Federal Communications Commission (FCC). Space and time constraints make it impossible to chronicle all of them here.

Therefore, a representative sampling has been selected. It includes AT&T, which no story on common carriers can omit; value-added packet-switching networks; satellite carriers; and a couple of smaller private-line carriers.

The primary thrust of this Product Spotlight is on data transmission, and the firms listed were asked to describe their service with that in mind.

One thing to bear in mind is that common carriers serve metropolitan areas as much as they do specific cities. So when one claims to serve 100 cities, it probably does so through a base of 25 or fewer large, individual cities.

The companies detailed in the chart are:

•***AT&T.*** Obviously the dominant common carrier in the U.S., if not the world, AT&T considers its Dataphone Digital Service to be its "premium" long-haul data service.

195 Broadway, New York, N.Y. 10007.

•***United States Transmission Systems (USTS).*** USTS is a subsidiary of ITT and a good example of a smaller size common carrier. Its backbone network stretches from Dallas to New York with "spurs" in other areas.

2 Broadway, 16th Floor, New York, N.Y. 10004.

•***Tymnet, Inc.*** The Tymnet value-added, packet-switching network is well-known for its ability to translate protocols and facilitate remote computing. It features high-, medium- and low-density cities, with prices being lowest in the first.

2710 Orchard Pkwy., San Jose, Calif. 95134.

•***GTE Telenet Communications Corp.*** Telenet is another value-added, packet-switching network with features closely paralleling Tymnet. The two networks are closely identified with each other but offer different pricing schemes.

8229 Boone Blvd., Vienna, Va. 22180

•***RCA Corp.*** The RCA Cylix Communications network differs from Tymnet and Telenet by its extensive use of satellite technology. The network includes earth stations in 30 cities.

800 Ridge Lake Blvd., Memphis, Tenn. 38119.

•***Compuserve.*** Perhaps best known for its time-sharing services, Compuserve also offers its Network Services, a value-added, packet-switched network. Its pricing scheme is similar to Tymnet's.

5000 Arlington Centre Blvd., P.O. Box 20212, Columbus, Ohio 43220.

•***Western Union Telegraph Co.*** Among its many offerings, Western Union provides private-line service to 47 "on net" cities. However, service is also provided (with an accompanying "pass-through" charge) to "off net" cities through other common carriers.

One Lake St., Upper Saddle River, N.J. 07458.

•***American Satellite Co.*** The Specialized Network Services Division stresses its pricing advantages over other common carriers for long-haul data transmission. The company owns 20% of the Western Union Westar satellite system.

1801 Research Blvd., Rockville, Md. 20850.

•***Satellite Business Systems.*** Through its private network services, SBS offers large-scale dedicated networks for very large (approximately 25) users. Other grades of service are available for lower volume users.

8283 Greensboro Drive, McLean, Va. 22102.

•***American Bell, Inc.*** Net 1000 is billed as an intelligent, packet-switching network that will allow on-line processing and protocol conversion. Formerly known as Advanced Communications Service (ACS), it is still being beta tested.

4 Wood Hollow Road, Parsippany, N.J. 07054.

CW Chart

Host of Carriers Challenging AT&T for Market

Product Spotlight

'More carriers accessing AT&T's network also means more carriers for end users to deal with. For example, if a user wanted to access Western Union from Nashville, Tenn., it would first have to go through the local BOC. At the point of Western Union termination, another BOC would be required to move the data from there to its ultimate destination. Beyond that, the user would have to deal with a modem manufacturer in order to obtain the necessary modems.'

(Continued from Page 1)

service, to GTE Telenet Communications Corp., which operates a value-added, packet-switching network, to satellite companies such as American Satellite Co.

Because the marketplace for the services these companies offer is so large and diverse, the fight may end in a standoff, according to Dr. Joseph Sciulli, president of the consulting firm Telecommunications Techniques Corp., based in Gaithersburg, Md.

"Somehow these things have to coexist and find their particular place in the system, rather than being the one thing that's going to take over and dominate the world," Sciulli commented. "All of these things have a place."

He called local distribution the most important problem currently facing the common carrier market. Alan Baughcum, director of telecommunications research for Charles River Associates, Inc. in Cambridge, Mass., agreed.

Baughcum said quality and cost of connection are the two primary problems facing carriers who want to interconnect with local loops. "There is the whole question of whether or not AT&T is going to have preferential treatment from the Bell operating companies," he noted. "The concern on the part of service providers is that their competitors not be given preferential treatment."

The Bell operating companies must provide equal interconnection access on an unbundled tariff basis to other common carriers over a two-year period starting Sept. 1, 1984 and ending Sept. 1, 1986.

Large users can bypass the local loop dilemma by taking advantage of services such as those offered by Satellite Business Systems, which provides digital end-to-end links between customer premises, he said.

Digital termination systems (DTS) will also bypass the local loops when they become available. "DTS could come on pretty soon, within the next year or two," Baughcum declared.

Dr. James Jewett, president of Telco Research Corp. in Nashville, Tenn., pointed out that more carriers accessing AT&T's network also means more carriers with which end users must deal. For example, if a user wanted to access Western Union from Nashville, Tenn., it would have to go first through the local Bell operating company. At the point of Western Union termination, another Bell operating company would be required to move the data from there to its ultimate destination. Beyond that, the user would have to deal with a modem manufacturer in order to obtain the necessary modems.

"Right there that's four vendors — two [Bell operating companies], Western Union and a modem manufacturer," Jewett said, "just to get a link between two points."

He claimed that wideband offerings like AT&T's Dataphone Digital Service, which provide data at T1 rates of 1.5M bit/sec, are the wave of the future. "I think T1 is clearly the evolving strategy for both data and voice people," the Telco Research president stated.

However, Bell will have to weigh its T1 options carefully, he added. If AT&T makes the price of T1 services too low, companies will be able to break the wide bandwidth into 24 voice channels — each of which could carry up to 56K bits of data — and then resell channel capacity, Jewett said. Those 56K bit/sec streams could also be multiplexed down into other lower speed channels (story below).

If, on the other hand, AT&T charges too much for T1, it will create a very favorable market for the satellite carriers because "satellites can compete with T1 very very well," Jewett said.

Concerning Bell's competition, Sciulli alluded to MCI Communications Corp. as a mostly voice-oriented common carrier that is making a serious move into long-haul data. "MCI is going to put in a lot of fiber and they basically bought out the Hughes satellite in one fell swoop," he said. "They're going to spend a billion dollars building wideband facilities. When you have fiber and satellites together, you have wideband covered over all distances."

AT&T

Dataphone Digital Service

- **Monthly private-line service.**
- **Multiply prices five times for 56K bit/sec service.**
- **For termination charges, add $198 for 2,400 bit/sec service, $516 for 4,800 bit/sec service, $706 for 9,600 bit/sec service and $1,016 for 56K bit/sec service.**

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Tymnet

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  - **— Synchronous monthly charge (for example, X.25, IBM Binary Synchronous Communications and 3270) depends on specific line speed and interface. Monthly charges per interface begin at $1,180; the one-time installation charge per interface begins at $1,000 for services from 2,400 to 4,800 bit/sec. Service at 56K bit/sec is on a special quotation basis for monthly charge per interface; the one-time installation charge is $1,000.**
- **Host front-end software (required for some host processors), $400.**
- **Character transmission charges range between five cents for the first 60,000 kilocharacters to one cent for anything over 200,000 kilocharacters.**
- **Terminal interface charges: Asynchronous 110 to 1,200 bit/sec Public Access Ports charged on hourly basis. Character transmission charges also apply unless otherwise stated for all forms of terminal interface. Hourly rate range: $2 to $4.25 with peak-time surcharges. Private Access Ports available in medium- and high-density cities for between $225/mo and $525/mo with one-time installation charge of $900.**
- **Dedicated Terminal Interfaces: Monthly charge of $1,000 and one-time installation charge of $1,000 for eight terminals with speeds from 110 to 1,200 bit/sec; monthly charge of $2,700 and one-time installation charge of $2,000 for 128 terminals at 110 to 1,200 bit/sec.**
- **Network connections for dedicated terminal interfaces range between $500 and $1,000 monthly and include a one-time installation charge of $1,000.**

CW Chart

Three Representative Pricing Schemes

They Divvy Up Bandwidth for Cash

Move to Wideband Brings Resale Carriers

By Bruce Hoard
CW Staff

One side effect of the move to wideband communications is the emergence of the resale common carrier. Usually with profit motive aforethought, but sometimes unintentionally, these companies are divvying up bandwidth for cash.

Resale carriers buy in bulk from another high-volume carrier high-speed links such as T1 or 1.5M bit/sec, multiplex them down into multiple, slower speed links and resell them to smaller users who cannot afford to buy bulk digital transmission.

According to Dr. Joseph Sciulli, president of Telecommunications Corp., the resale scene can be a favorable one for small users. "If they have that guy in between called the resale carrier, who will unbundle it for them, break it down, do the multiplexing and transmission, terminations and local distribution, [a smaller user] may be able to buy service more cheaply than he could if he went directly to Bell," Sciulli noted.

He added that the ideal place for a resale carrier is in an area where there are many small businesses that are interested in purchasing broken-down bandwidth.

However, not all resale common carriers are offering premeditated services. As Sciulli put it, "People are starting to treat capacity like a condominium; you buy a piece and you have a share of the total risk. You're going to see more and more of that kind of thing."

Less Favorable Side

Dr. James Jewett, president of Telco Research Corp., discussed another, but less favorable, side of the resale scene. He said some resellers who deal in wide-area coverage make a lot of money on the way they measure the beginning and termination of a call. He claimed that resold Wats substitutes are more economical than other resale offerings because people can more readily compare resold Wats prices with normal Wats prices.

"There is a great deal of deception done, particularly with the small resalers and the wide-area coverage," Jewett declared.

This unpleasant situation is particularly applicable to data callers performing such tasks as dial-up polling for point-of-sale inquiries, he added.

So how can people protect themselves? "They basically can't," he replied.

Alan Baughcum, director of Telecommunications Research with Charles River Associates, Inc., said one thing to consider about resale common carriers is their ability to provide quality of service in conjunction with their low prices. Because resellers are so heavily dependent on pricing in order to sell their products, they are also vulnerable to price responses from AT&T.

"Part of the question is how long are these resalers going to be in business," he commented.

To Respond to Emergency Calls

Los Angeles Police to Launch $42 Million System

By Robert Batt
CW West Coast Bureau

LOS ANGELES — After almost 15 years of planning, the nation's third largest city next month will launch what is expected to be one of the biggest police command and control systems in the world.

The $42 million Emergency Command Control Communications System (ECCCS) took 10 years to be approved and another 4½ years to build. It will be fully operative next month, 14 months behind schedule.

The system was designed to cut down substantially on the Los Angeles Police Department (LAPD) response times to the three million calls for help it receives each year. Crime rates in the city continue to increase, although at a diminishing rate compared with previous years.

"Under our current manual system, it takes two to three minutes on average to respond to an emergency call and send police officers to the scene of a possible crime. Using ECCCS, we will be able to cut this time down to 30 seconds," claimed David Burney, an LAPD captain and the system's program manager.

Under the system, the LAPD's two data centers will be merged into one. Telephone calls currently received at the LAPD's San Fernando Valley communications facility in Van Ness will be transferred to the Los Angeles data center, which will act as the central terminal for all calls for help. The 100 people working in Van Ness will move to the Los Angeles data center, but no computer equipment is involved in the transfer.

"The transfer will be transparent to the public and there will be no disruption of service," Burney promised.

The new system is based around four Digital Equipment Corp. PDP-11/70 and two PDP-11/34 minis, six PDP-11/03 micros, 143 programmable terminals, 855 mobile digital terminals and 3600 portable radios. The four PDP-11/70s provide ECCCS' primary data processing capability. Two are designated as communications processors and two as main system processors.

Fortran, HOL and ALC are the main languages used.

The DP segment of the system includes 11.8M bytes of main memory, eight disk controllers and 10 disk drives.

The new project's design was not without its problems. The LAPD wanted to adopt a systems approach to implementing ECCCS and chose a local systems firm, System Development Corp. (SDC), rather than an equipment manufacturer, as prime contractor for the project.

The project was scheduled to be completed within 3½ years. "There was fierce competition for the project, and SDC brought its time line down from an initial 50 months to 42 months in order to get the project, although I think they knew full well they couldn't meet the deadline," Burney said. The baseline design, which should have taken just four months, actually took 18 months.

Never Caught Up

Moreover, "there were a lot of problems at the beginning in defining the system and translating it into computer specification, and once behind, we were never able to make up for lost time," Burney added.

SDC refused to comment on the delays, citing contractual obligations as the reason for remaining tight-lipped about the affair.

To house the new system, the LAPD built a central dispatch center that holds 60 consoles and 300 employees. In addition to improving response times to citizen calls for service, ECCCS is expected to give better protection to the city's 6,900 police officers and help dispatch LAPD forces during both routine and emergency conditions. By doing so, the system is intended to help save lives, improve the coordination of resources and provide for more cost-effective operations.

Court Stays Comsat Ruling

WASHINGTON, D.C. — The circuit court of appeals here has stayed implementation of a recent Federal Communications Commission (FCC) decision allowing Communication Satellite Corp. (Comsat) to offer its services directly to end users. A tariff covering the new Comsat services was to have gone into effect at the end of last month.

The court acted on petitions submitted by several international record carriers (IRC), which insist the FCC ruling discriminates against them. The IRCs, which currently have to go through Comsat earth stations, want to access international satellite facilities directly.

It will take at least three months, according to a court spokesman, for the court to decide whether the FCC order should be changed. The stay will remain in effect in the meantime.

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THE INDUSTRY'S MARKET SUPPORT CENTER

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EEC Approaches IBM to Settle Antitrust Action

By Rex Malik
Special to CW‡

The legal battle between IBM and the European Economic Community (EEC) may be drawing to a close. The EEC's European Commission has given IBM proposals for the settlement of its antitrust complaint, according to a recent report in the British weekly *Computing*.

The European Commission, the civil service arm of the 10-nation EEC, will neither confirm nor deny that it has sent the proposals to IBM. Under EEC law and procedures, such proposals are private until agreement and a legal decision are reached.

Nevertheless, European sources indicate that the first proposal requires IBM to make channel-to-controller interface information — the so-called 370-compatible instruction set — available to anyone who wants it within 30 days of the announcement of a new IBM product in Europe.

IBM will be able to make its disclosure conditional on the requirement that the company requesting it not sell outside the EEC a product based on the interface data until IBM makes its product announcement outside the EEC.

This is largely academic, because products in the range covered are usually first announced in the U.S.

In addition, IBM will be able to charge a small price, reputedly 1% of the value of the product, if another vendor introduces a product that utilizes the interface information.

The second proposal reportedly involves IBM's pricing practices for main memory. The European Commission wants IBM to offer CPUs with and without memory and to provide fair pricing for the memory.

The Aim of the Proposal

The aim of the proposal seems to be to prevent IBM from offering purchasers an unfair inducement to buy IBM memory by pricing it substantially lower when it is bought as part of a system than when it is separately priced or bought as add-on memory.

These proposals cover IBM's 370, 4300 and 30 series mainframes. It is unlikely that IBM will be bound by these proposals in the case of some future large system series that uses a different instruction set. However, many IBM watchers feel that the vendor will comply with these proposals on currently unannounced systems rather than face the same investigation again.

The memory pricing proposal was supposedly a surprise to IBM, which reportedly considered that issue dead. The interface proposal, however, was not totally unexpected [CW, Feb. 28].

IBM has until April to respond to the European Commission's proposals. The consensus among industry observers is that the vendor will agree to both proposals rather than face a hearing before the European Court of Justice, which would probably generate unfavorable publicity.

The commission's original objections to IBM's alleged practices were made as a result of inquiries prompted by complaints from U.S. companies including Memorex Corp., National Advanced Systems, Inc. and Amdahl Corp. These complaints were compared by many to the issues raised in the U.S. vs. IBM antitrust suit, which was dismissed last year.

The Commission originally confronted IBM with four complaints. They were concerned with the unbundling of systems software and with IBM's System Installation Productivity Option tapes. IBM has apparently changed its practices in these areas, although there is some question on whether the EEC complaint had anything to do with such change of practice.

Case Homework To Go Paperless

CLEVELAND — Students at Case Institute of Technology at Case Western Reserve University will submit paperless homework this fall as part of a research project designed to streamline the information flow between professors and students.

Eight hundred to 1,000 freshmen and sophomores on the Case campus will use about 75 Digital Equipment Corp. Professional 350 personal computers. The microprocessors at the college will be linked to a Digital Equipment Corp. VAX-11/730 supermini via a Xerox Corp. Ethernet local-area network.

According to Donald E. Schuele, vice-dean of the institute, science and engineering students will use the computers to do homework assignments, and the faculty will use them to assign problems and record grades.

Fifty of the computers will be installed in a laboratory for students to use on a rotating schedule 16 hours per day, six or seven days a week. Others will be placed in six-person dormitory suites.

Residents of the suites can lease a computer jointly for about $1,000 a year for four years, with an option to buy it for about $6,600, Schuele said.

Students have shown a great deal of enthusiasm for the program so far. "The hardest people to convince are probably the faculty," Schuele maintained.

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For application information, CW21 write to or call: Cynthia Johnson, Corporate Liaison, Wang Institute of Graduate Studies, School of Information Technology, Tyng Road, Tyngsboro, MA 01879, (617) 649-9731.

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Bell Labs Exec Cites OA Needs

Lack of Managerial Support Systems Lamented

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — One largely uncharted territory of office automation — managerial support systems — will stubbornly resist the incursion of automation until there are radical changes in systems design and implementation, according to a Bell Laboratories executive.

Joseph L. Laferrera Jr., executive director of Bell Labs' Management Information and Administrative Systems Division, said in his keynote address at the Federal Office Systems Expo here that "with all the recent hype in office systems . . . it is moving rather slowly at the managerial level." In his March 15 address, Laferrera discussed the conclusions reached by Bell Labs after surveying many of the approximately 100 office systems now available and after implementing a prototype system at Bell Labs.

Most current systems are "very heavily word processing-oriented" and "more nearly suit the needs of the clerical and support staffs than they suit the needs of the manager." They also suffer, he said, from little integration of voice, data and video, from a lack of integration with decision support systems and from incompatibility with other systems.

Moreover, they do not resolve networking issues, do not "fit" into office environments, pay "relatively little attention" to security and present no clear future direction or strategy.

The answer to these problems at some organizations is to deploy personal computers for managers, Laferrera noted. But this is "grasping" for a quick solution and is more of "a Band-Aid when open-heart surgery is really called for." The problem with personal computers, he explained, is that they generally lack interfaces with corporate mainframes, where 99% of the important data is stored.

Some of the findings of Laferrera's department, based on implementing a prototype managerial support system at the highest levels of Bell Labs, were:

- Understanding office sociology is as important as understanding technology. "The rituals, mores and the culture determine the systems by which the office functions," he said, adding that his experience showed secretaries cannot be removed from the office information loop without a disaster.
- "Managers are simply not a tolerant lot." The system must be functioning close to 100% of the time and have almost instantaneous response time or it will not be used. "Managers simply don't understand and are not willing to learn how files end up in computer heaven," he observed.
- Office systems need rules just as all offices have understood operating procedures. These types of rules "don't exist in the automated systems today," he said.
- System flexibility is absolutely vital. People will adjust to individual managers, he said, but systems generally do not — "they either come in vanilla or vanilla." Systems must be adjustable to the needs of each user, he said.
- Aesthetics are important. "The office is typically a reflection of the manager . . . Good systems blend in," according to Laferrera, who said managers typically say aesthetics are not important, "but they don't mean it."

He concluded from the Bell Labs experiment that managers must participate in the information age. Leaders must "show personal involvement and commitment" to automation. "The survival of the manager is threatened unless he or she plugs into what is undoubtably the inevitable," he added.

Laferrera also warned that managerial automation cannot be cost justified in the usual meaning of the term, but can be justified on the basis of long-term benefits to the manager. He noted there are unresolved technical issues of automation that persuade some organizations to delay automation. Calling this unwise, Laferrera said "Technical problems are always solved."

He said managerial participation in systems implementation must be well planned and supported by the organization and by the vendor. He noted that people are uncomfortable with automation because it offers no clear destination, merely an identifiable direction.

In summary, Laferrera stated, "The question is not whether managers need to be participants in the information age; the real question is, can they afford to be spectators?"

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People, Not Tech, Seen Making MIS Winners

By Bob Johnson
CW New York Bureau

NEW ORLEANS — People, not technology, will make the difference between DP winners and losers in company management information systems (MIS) organizations, according to a speaker at the Life Office Management Association (Loma) 1983 Systems Forum held here last week.

Brandt R. Allen, a University of Virginia professor and computer industry lecturer, told insurance industry DPers that computer personnel today make up the biggest part of most companies' applications systems areas and they represent the major portion of DP budgetary expenditures.

Because effective information processing in the future will depend on people rather than new technology, Allen reasoned, savvy DPers will have to plan their MIS organizations with this fact in mind. "A typical order entry system in a large organization in 1982-83 is likely to have a cost breakdown made up of about 31% system hardware and software, about 22% communications, 1% cooling and energy costs and 46% personnel," Allen maintained.

He claimed that not only are personnel costs high now, they are expected to rise. In many companies, Allen noted, the DP personnel cost figures are closer to 50% and even 80%, and some Japanese companies report people costs to be near 85%.

Illustrating the importance of personnel, Allen said that considering the lower costs of hardware and the rising costs of DPers, the average company's cost for computer time per hour is about the same as that of a programmer's. By 1990, the average programmer's salary could probably buy an IBM 3033 CPU.

The speaker stressed that MIS organizations must plan to find better solutions and technologies so that these people, who make up the bulk of DP costs, can be used less. He stated that a key measure for MIS to strive for is the ability to do the job with "fewer heads".

End of an Era

Allen told conference attendees that DP is reaching an end of an era, pointing out that although computer hardware is cheap, the cost of computing is rising. He stated that this growth rate can account for some of the increase, but personnel is a major expenditure. "I am now working with companies which expect their DP budgets to increase to three times their amount in 1986 and 1987," Allen said.

Computer personnel will become even more of a problem because more people will be needed to work on the current backlog of applications the industry now faces, Allen said. The speaker claimed that his experience with Fortune 500 companies reveals that there is as much as a three-year backlog of applications in these firms.

Along with the problem of applications backlog, rising DP personnel costs will stem from what Allen referred to as "badly needed" productivity developments. "There is currently little prospect for the development of productivity tools in DP. There is virtually no software that can keep pace with what the industry needs," he said.

The professor predicted that the industry will not get these kinds of tools by using the programming languages of today. He said that 80% of the big user companies have most of their applications coded in Cobol and they simply do not support the productivity improvements that are required.

CW Photo by B. Johnson

'There is virtually no software that can keep pace with what the industry needs,' Brandt R. Allen told the Loma conference last week.

"Cobol won't go away, but I hope by 1990 it will be considered a dead language. The future of DP does not belong to these languages. Many of the applications now in use date back to the IBM 360 CPU line. They are not competitive. They are creaky, brittle, dangerous and expensive to maintain. They reflect a way of doing business that is 25 years old," Allen said.

Another issue for MIS to be concerned with is that of a "serious shortage" of qualified people to do the DP job. Allen said that by 1990 there will be close to one million job positions in programming, but the job's traditionally high turnover rate, the predicted drop in the number of people entering the work force (25% drop in the next 10 years) and young people's decreasing aptitude for programming-type work will fuel this shortage.

Local Net Seen Key Item In Communications Plan

By Bob Johnson
CW New York Bureau

NEW ORLEANS — A "tidal wave of user dissatisfaction that will pale the common complaints of today" will be heard throughout an organization if DPers do not plan effectively for data communications.

That was what Dixon Doll, president of the DMW Group, Inc., told insurance industry information systems executives at the 1983 Systems Forum of the Life Office Management Association (Loma) here last week. Doll said that if a company expects to keep up with the rapidly changing telecommunications industry, a "master information technology plan" is necessary to translate the technology into business benefits.

The key to effective planning for the new technologies, according to the speaker, is in knowing what the DPer's particular business and user needs are, then finding the combination of vendors to meet these needs.

Doll maintained that an "electronic delivery mechanism" must be planned so that all business enterprises can be effective users. A "systematic" and well-conceived network of technologies such as local-area networks and private branch exchanges is essential if a company's telecommunications in the next decade is to serve its needs, he said.

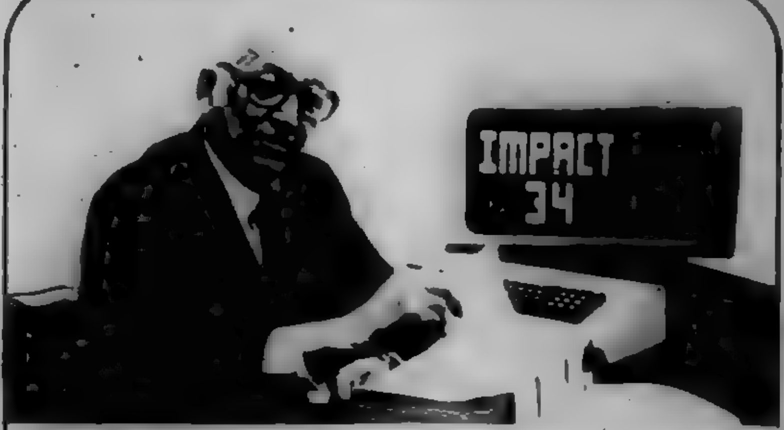
A major part of the electronic delivery system to be planned for by the DP manager, according to Doll, is "end-to-end office communications." He pointed out that in order to establish such a system, these managers must deal with up to 15 different companies and vendors, including communications operating companies, local facilities, interchange carriers and so on. This fact, combined with the changes that will occur in 1984 because of the AT&T divestitutre, makes it even more crucial to plan ahead.

The key aspect of this plan, Doll noted, is the local-area network. He advocated that it be an "open" network incorporating a mixture of vendor workstations, personal computers, telephones and communications that can all be plugged directly into it. This is the only way a high level of business communications can be accomplished effectively in the future, Doll claimed.

"When selecting a [local-area network], you must look at all of the possible alternatives. The world of the future should allow for users in one building to exchange information with users in other buildings as easily as it is to exchange with each other," he said.

In planning for communications, the DP manager should think of the project in pure telecommunications terms and then address the areas of information network architecture, office automation and so on. After that, "complimentary" requirements such as data management and applications deveopment can be worked out, Doll said.

"Use all of your previous information and work interactively with senior management executives to determine a prioritized list of strategic telecommunications projects and programs with the highest payback for individual enterprises," he advised.



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Relationship No Longer Adversarial

Users Group Proposals Often Adopted by NCR

By Susan Blakeney
CW Staff

For Charles Yahn, being a member of the Mid-Atlantic NCR Users Group has been a positive experience for both himself and his employer.

"I think the users group has helped me grow and manage better," confided Yahn, the controller of United Associated Grocers, Inc. in Robesonia, Pa. "My association with NCR [Corp.] users from here and Europe has really widened my perspective . . . it's been very beneficial for my personal growth and for my company's."

Yahn has seen the Federation of NCR Users Groups — comprised of 27 NCR user-groups — grow to an organization with 1,800 members since its inception in 1970. "NCR really listens to us," Yahn said. "We went through a tough period when NCR products needed a lot of interfaces for users. The group was very vocal and adversary then. That's changed somewhat now, but a lot's come out of the group."

Yahn's only reservation about the users group is that its annual convention is getting too large. "I'm amazed at the size of these conventions. It's getting too big to manage ourselves. I think we'll have to go to an outside agency."

The Federation of NCR Users Groups is the governing body of the 27 separate special interest and regionalized NCR users group. It is staffed by one full-time person who coordinates NCR user activities and produces the NCR users group newsletters. The vendor itself employs two full-time people to act as liaisons to the multiple users groups and helps out with the federation's administrative chores.

With the exception of the two NCR administrators, the users group takes care of itself in terms of operations and finance. It generates its own annual budget of roughly $124,000 from its conventions and seminars.

Joe Ternavan, president of Bank Information Processing, Inc. in Bloomingdale, Ill., is chairman of the federation. According to Ternavan, the users group enjoys a very solid and productive relationship with the vendor. "For example, we submit about 300 software proposals a year. Of those, 40% are usually accepted," he noted.

"They [NCR] also currently sponsor four of the special committees we've got going now," which include advisory groups on software, publications, education and communications.

Rosna Pamas, data processing manager of Mammoth Mountain Ski Area in Mammoth Lakes, Calif., is editor of the quarterly Federation publication called *Sitebytes*. A member of the Northern California NCR Retailers Users Group for seven years, Pamas lamented that this local group is "slowly dying because it includes too many people with too many different needs — a mix of large users and small users.

"You have to tailor them [users groups] specifically to people's needs — banking, retailing [and so on].

"Also, users groups fold because when you first form them you have a lot of complaints. Once you solve these problems, they tend to fall apart," she commented.

To counter this situation, Pamas wants to organize a local retailers group because of her location. "We're three hours away from the nearest big city [Reno, Nev.]. Groups need to be both specific and convenient to be effective."

On the whole, however, Pamas said she feels positively about her affiliation with the users group. "I feel users groups are a great idea if you can find the right group.

"I find the meetings I can get to very useful, and everyone I've talked to has, too . . . I established a lot of great contacts. If you know someone who can help you solve your problems, it's so much better than calling the vendor's toll-free service number," she concluded.

The Federation of NCR Users can be reached through Mail Station SDC-2, Dayton, Ohio 45479.

Nucon '83 Set Next Month

KANSAS CITY, Mo. — "Information Management: The Bottom Line" will be the theme of Nucon: '83, the annual conference of the Federation of NCR Users Groups that will be held here April 24-27.

The keynote address, "Right Place, Right Time," will be given by Ty Boyd, a broadcaster and sales consultant.

The registration fee until April 1 is $365; after April 1, it is $440. Forms and more information are available from Nucon: '83 Central Service Office, Box 152, Dayton, Ohio 45401.

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'Politics' Not a Dirty Word, Consultant Says

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — Problems involving company politics account for the vast majority of failures in systems development projects, according to the head of a local DP consulting firm.

For many, "politics" has become a dirty word synonymous with Machiavellian machinations. But the popular conception of politics as inherently corrupt or evil is wrong, consultant Robert Block said here recently during a seminar sponsored by the Association for Systems Management.

The truth of the matter is that politics is little more than the familiar process by which distinct groups of corporate employees interact with each other, Block said.

During the course of an ordinary workday, Block noted, managers of systems development projects are called upon to deal with a wide assortment of non-DP personnel — end users, vendors, upper management and auditors, to name just a few.

The resulting interactions with these diverse groups are primarily political and, if the interactions are somehow disrupted, systems development projects can often go awry, Block said during the seminar, which dealt with microcomputers in big business.

Like it or not, politics pervades just about every facet of corporate life, and project managers who refuse to take part in their companies' political goings-on do so at their own risk, Block warned.

"You can't afford not to play the political game," the president of Robert Block Associates, Inc. said. "Not playing the game is itself a political move, and it's not a particularly good one."

The problem with engaging in company politics is that most of the computing personnel who are promoted to the position of project manager come from the technical ranks. Thus, such individuals are frequently ill-equipped to deal with anything political, Block said.

To increase their political savvy, managers of systems development efforts first must realize that company politics is basically a six-step process that can be learned eventually. The six steps include:

- Definition of systems goals.
- Evaluation of a corporate systems department's assets and liabilities.
- Understanding the environment of an intended system's users.
- Identification of a development project's potential pitfalls.
- Formulation of possible solutions to those problems.
- Implementation of the solutions and appraisal of the results.

In the first step, project managers should seek to distinguish between a proposed system's critical features and the ones that are desirable, but unnecessary, Block said.

In the third step, project managers would be well advised to try to understand their companies' organization and procedures, both formal and informal.

They also need to understand the responsibilities and motivations of the major corporate "players" with whom they will have to interact during a systems implementation effort, Block added.

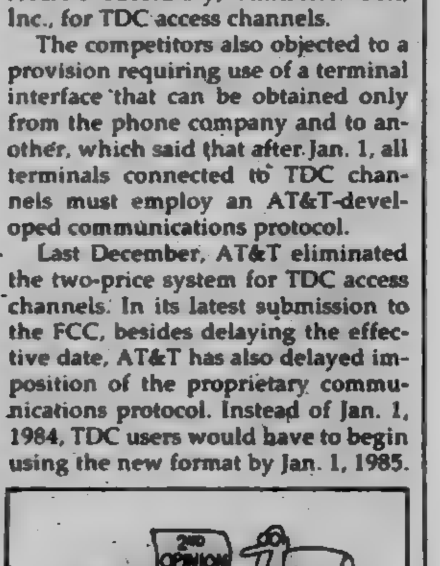
AT&T Delays TDC Service

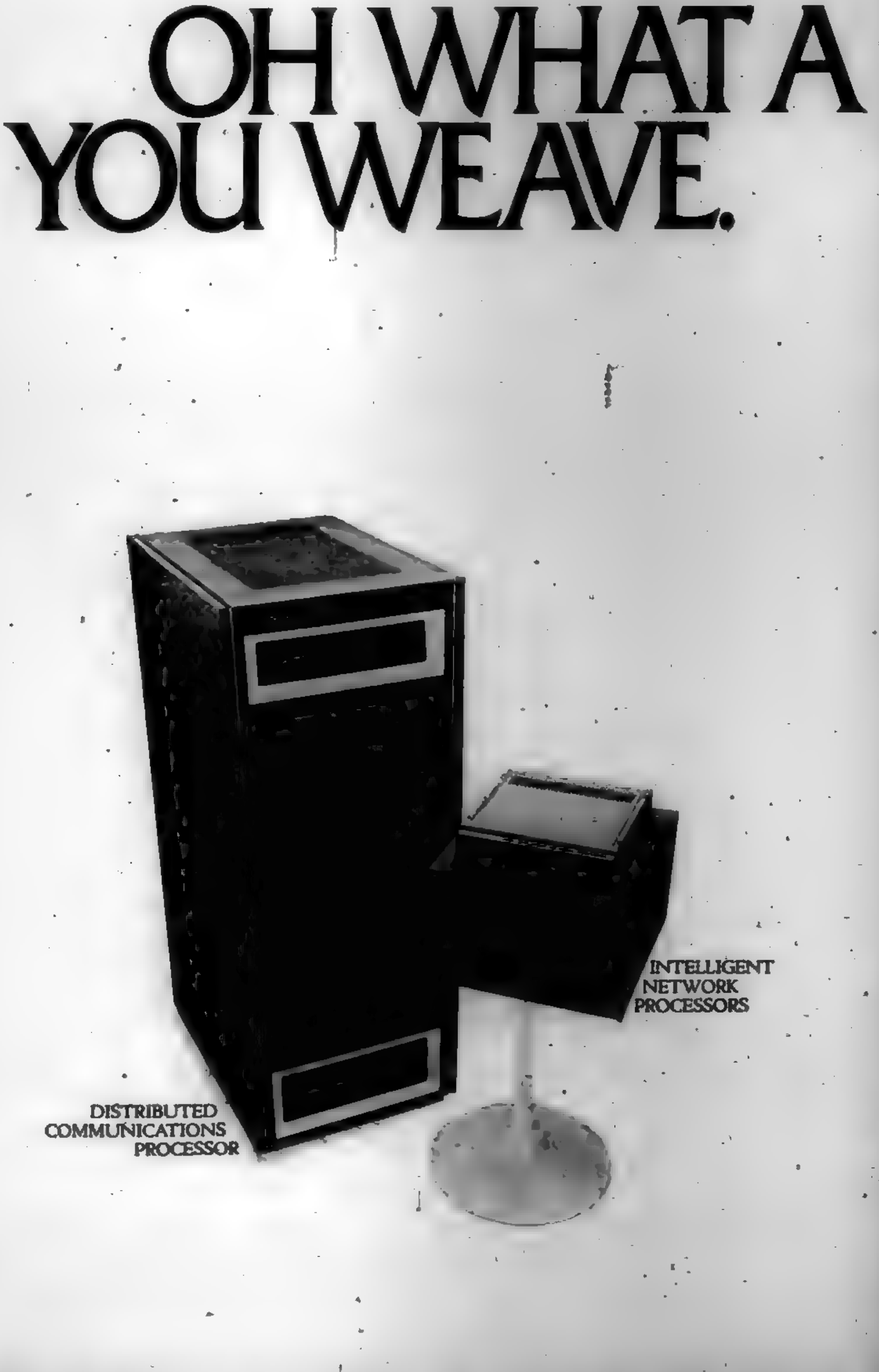
WASHINGTON, D.C. — AT&T has delayed the effective date of its Terrestrial Digital Circuits (TDC) service and has modified a controversial provision of its tariff. However, the moves are not expected to satisfy competitors, which means further delay is possible.

TDC, a point-to-point dedicated digital private-line service, is intended to be a replacement for 1.544M bit/sec Dataphone Digital Service. When the original tariff was submitted to the Federal Communications Commission (FCC) several months ago, competitors complained that they would have to pay more than AT&T's subsidiary, American Bell, Inc., for TDC access channels.

The competitors also objected to a provision requiring use of a terminal interface that can be obtained only from the phone company and to another, which said that after Jan. 1, all terminals connected to TDC channels must employ an AT&T-developed communications protocol.

Last December, AT&T eliminated the two-price system for TDC access channels. In its latest submission to the FCC, besides delaying the effective date, AT&T has also delayed imposition of the proprietary communications protocol. Instead of Jan. 1, 1984, TDC users would have to begin using the new format by Jan. 1, 1985.

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Three Steps to Effective Management Offered

CW Photo by J. Beeler

'Feedback about results is the breakfast of champions,' Dr. Kenneth Blanchard said recently.

By Jeffry Beeler

CW West Coast Bureau

SAN FRANCISCO — Information systems managers could improve their employees' motivation and thus boost their departments' output if they would follow just three simple steps, according to author and management consultant Dr. Kenneth Blanchard.

The three keys to increased management effectiveness include clearly defined job goals, praise and reprimand, Blanchard said during a recent seminar sponsored by the Association for Systems Management.

For a systems department to function smoothly, DP managers and their subordinates first must agree on precisely what their goals are.

"If you don't have goals, you're not a manager. You're just mucking around," the head of Escondido, Calif.-based Blanchard Training and Development, Inc. said.

Systems managers and their staffs also must define mutually agreeable standards for acceptable employee performance, Blanchard said during the seminar, which dealt with the topic of microcomputers in big business.

A second component of effective systems management is praising employees for a job well done. "The key to personnel development is catching people in the act of doing something right," the author of the best-selling management guide, *The One-Minute Manager*, said.

To be effective, praise has to be timely. A pat on the back loses much of its intended impact if it is awarded for praiseworthy performance that occurred a month earlier, Blanchard noted.

Praise should also be specific, Blanchard said. When complimenting employees for a job well done, managers should make sure to cite particular deeds or accomplishments.

The third component of improved systems management is effective reprimanding. Like praise, reprimands need to be both timely and specific, but they should also be reserved exclusively for employees who are already winners.

Never punish subordinates who are still learning to be effective. "Punishing people who aren't yet winners only makes them feel more insecure," Blanchard said. "Punishment works only for correcting problems in attitude, not for problems in performance."

Reprimands and praise are the key ingredients of effective feedback, which Blanchard described as the most powerful known motivator of human beings.

"Feedback about results is the breakfast of champions," Blanchard said.

Aicpa Schedules Micro Meet

CHICAGO — The American Institute of Certified Public Accountants (Aicpa) will hold its annual Microcomputer Conference May 15-18 at the Hyatt Regency O'Hare here.

General session topics to be covered include "Introduction to Microcomputers," "Microcomputer Hardware and Software Selection," "How to Get Started" and "Micro Pleasures and Pitfalls."

The conference is organized according to three levels. An introductory session program costs $150, the advanced program costs $250 and a combined session fee is $350. Registration fees include sessions, conference materials, continental breakfasts, luncheons and coffee breaks. Hotel accommodations are not included.

More information is available from Aicpa's Meetings Department, 1211 Ave. of the Americas, New York, N.Y. 10036.

Newsletter Devoted To IBM System/34

JACKSON, Miss. — "Tips and Techniques," a monthly journal devoted to the IBM System/34, was recently announced by Britz Publishing, Inc. The newsletter's primary focus is on system design and programming in RPG-II language.

Each issue of "Tips and Techniques" contains 10 to 15 tips on program-coding techniques, data manipulation and system operations, along with hints on disk space, library space and printer operations.

Annual subscription to the newsletter is $50. A sample issue can be obtained free of charge through Tips and Techniques, 1814 Capital Towers, Jackson, Miss. 39201.

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Amdahl, Branscomb To Address Ifip '83 In Paris Sept. 19-23

PARIS — The International Federation for Information Processing has released a list of speakers for the 9th World Computer Congress (Ifip '83), which will be held here Sept. 19-23.

Thirteen U.S. computer scientists are among the 42 people who have accepted Ifip invitations to speak at the conference. They include Dr. Gene M. Amdahl, chairman of the board of Trilogy, Ltd., who will discuss architectural designs for high-performance systems; Dr. Lewis M. Branscomb, IBM vice-president and chief scientist, who will address the problems associated with designing user-friendly systems; and Gordon E. Moore, chairman of the board at Intel Corp., who will discuss the evolution of the microprocessor.

Other scheduled speakers include Tohru Moto-Oka and Kazuhiro Fuchi of the Department of Electrical Engineering at the University of Tokyo, who will discuss the architectures of fifth-generation computers; Prof. J.D. Nicoud of the Ecole Polytechnique Federale in Lausanne, France, who will address the expectations of standardization; and Dr. G.K. Gupta, a member of the Department of Computer Science at Australia's Monash University, who will speak on computing in developing countries in Asia.

Subjects to be discussed are grouped into 10 areas: Computer Hardware and Architecture, Computer Software, Theoretical Foundations of Information Processing, Computer Networks and Communications, Data Base and Information Systems, Application Systems, Office Information Systems, Microprocessor Applications, Social and Economic Implications and Computers in Everyday Life.

More information is available from Philip Doran, chairman of the marketing committee of the U.S. Committee for Ifip '83, 25 E. 86th St., New York, N.Y. 10028.

Grants Available for Ifip '83

ARLINGTON, Va. — The National Science Foundation will provide funding to send American computer scientists to the 9th World Computer Congress Sept. 19-23 in Paris.

The grants, which will be awarded by the American Federation of Information Processing Societies (Afips), are available to computer scientists who have either already made significant contributions to computing or who show potential for making significant contributions, Afips said.

The grants can range up to $1,050 (basically the cost of round-trip airfare). Those who wish to apply for a grant must send Afips a letter by April 15 outlining approximate dates of travel, point of departure, planned participation in the conference, expected benefits to be gained from the conference, other sources of support for the trip, a brief biography and a statement of willingness to provide a postconference report to Afips within 30 days after returning from the conference.

Applications should be addressed to John Gilbert, Afips, 1815 N. Lynn St., Arlington, Va. 22209.

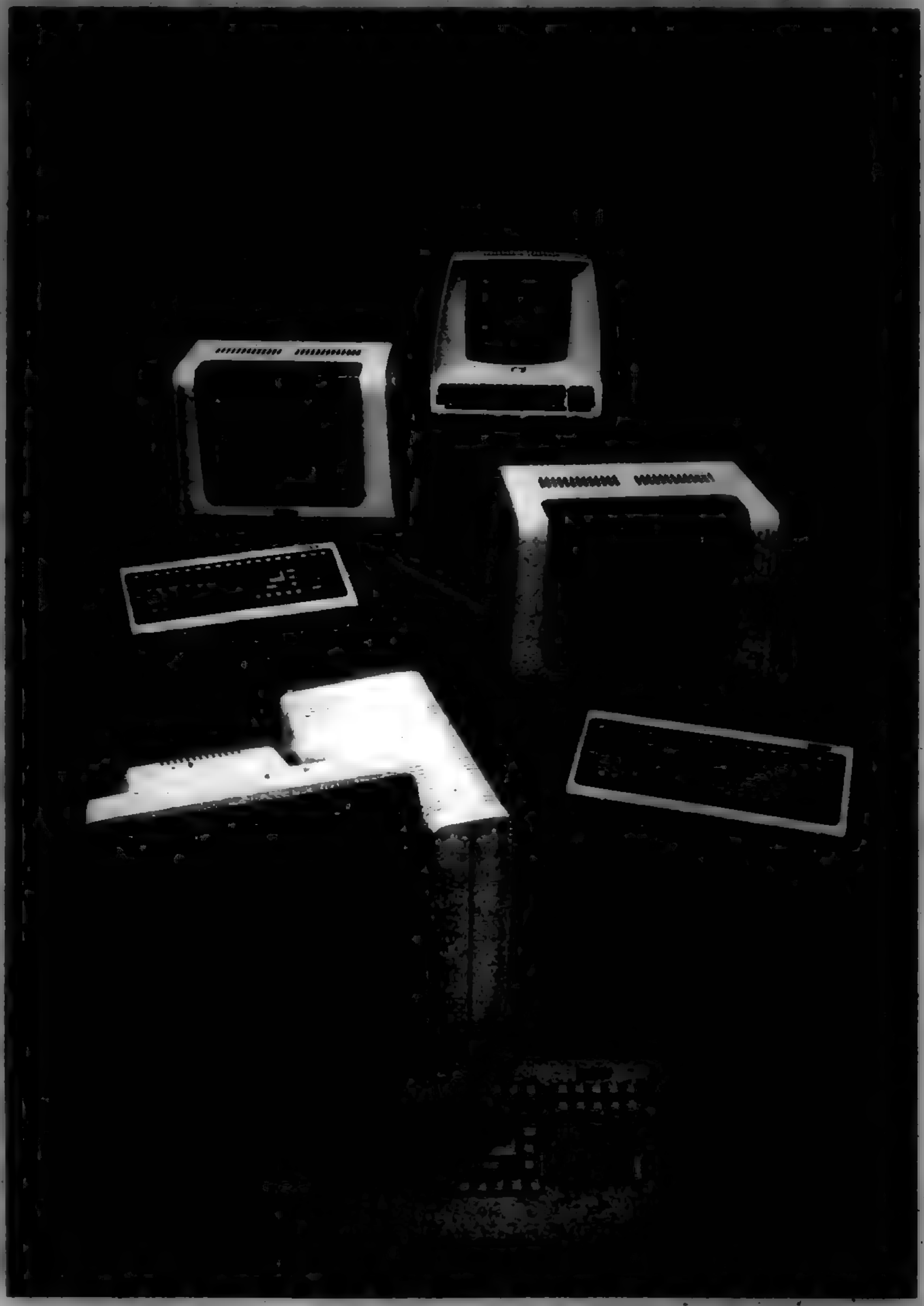
Set of Standards Out for Designers

ESTILL SPRINGS, Tenn. — A four-volume set of software design standards for software designers, managers and quality assurance departments is available from Associated Technology Co.

The set covers documentation practices and standards for programming in Cobol, Fortran and Basic.

It is useful in establishing internal programming and documentation practices, a company spokesman explained.

The set costs $45 from Associated Technology, Rt. 2, Box 448, Estill Springs, Tenn. 37330.



DPers Told 'Tight Shop' No Longer Enough

By Bob Johnson
CW New York Bureau

STAMFORD, Conn. — DP managers cannot remain stuck in the large systems world, but must maintain overall DP control and strike a balance between end users and new technologies if they expect to offer their companies effective information processing, a research company executive said here in a recent interview.

Mark Ludwig, president of Techtran, a subsidiary of the Gartner Group, which supplies information to IBM systems users, said that it is no longer enough for management information systems (MIS) executives simply to operate a "tight DP shop." Instead, they must become the controlling center of a company's entire information processing function.

The executive maintained that a potential "threat" faces the MIS department — it could lose its functional day-to-day responsibilities and its manager could become just a manager of a big DP utility. He cautioned that DPers must be aware of DP work done in their organizations without DP department intervention.

One evident and major threat to Data Processing control is telecommunications, Ludwig noted.

"Information processing no longer has the luxury of separating telecommunications and DP. The technologies are merging rapidly," he said. "DP may be forced to take a secondary role to telecommunications if it doesn't grab the lead now," he said.

To illustrate his point, Ludwig said that users now regard private branch exchanges as local-area network controllers and that companies with centrally configured computers are now looking at AT&T as the only viable alternative to IBM.

The change in user status within the industry must also be faced, according to Ludwig. "If one looks at the trends of the last five years in organizations, one would note that along with the proliferation of minicomputers and microcomputers, a shift of power is moving toward the end user. In the 1960s, in the mainframe era, a company like IBM could establish account control within a company. But now, with smaller systems making their way in, it is no longer sufficient to remain only in control of the central computer.

"Companies like Wang [Laboratories, Inc.] and Digital Equipment Corp. are also establishing control and bringing computer power to those outside of MIS. MIS cannot continue to cling to the central resource and ignore the end user," he warned.

Compatibility Key

Ludwig said that the technological advancements and improvements that communications and small systems bring are fine if they facilitate good information flow throughout a company. However, he said that there is a definite danger if myriad systems and technologies are scattered through a firm without compatibility.

"It is essential that MIS play a part in the combination of technologies. If you allow everyone in a company who has a little money to go ahead and buy their own little system, what you will wind up with is too many personalized systems.

"If this is the case and users are faced with incompatible systems, the company will find itself spending money on information tools so tied to one person that anyone new who tried to come in and use it would have to start from scratch. There wouldn't be any real contiguous, integrated information network at all," he observed.

There are certain paths MIS should take in jockeying for DP control, Ludwig noted. He said that the MIS department should perceive itself as the center of all information tools and that DPers should look at the move toward end-user computing as a trend that will give them an opportunity to coordinate information processing tools. He claimed that this is the time for DPers to establish a balance between end users and his area.

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Software Engineering Costs Topic of April DPMA Meet

LOS ANGELES — "Software Engineering Economics" will be the theme of the Data Processing Management Association's (DPMA) Educational Foundation seminar here April 18-19 and in San Francisco April 21-22.

Dr. Barry W. Boehm, chief engineer of TRW, Inc.'s Software and Information Systems Division, will discuss management planning and control, the development of a long-range software productivity program and effective life cycle cost estimating.

The two-day seminar costs $445 for DPMA members, $475 for others and $410 each for teams of three or more. More information is available from DPMA, Department SEE, Box 3608, Torrance, Calif. 90510.

Slated for May 2-4

Young to Speak at AIM Conference

WASHINGTON, D.C. — Atlanta's Mayor Andrew Young will be a featured speaker when the Associated Information Managers (AIM) holds its second annual conference will be based on the theme "Managing in an Information-Competitive World Economy."

Other featured speakers will include Desmond Hudson, president of Northern Telecom, Inc., and Richard S. Beal, special assistant to the president and director of the U.S. Office of Planning and Evaluation.

Some issues to be addressed include selecting the best software packages for an organization, impact and potential of personal computers in the office and designing professional/manager workstations.

The registration fee for AIM members is $300 before April 1 and $350 after that date. The fee for nonmembers is $400 before April 1 and $450 after that date.

AIM is located at 316 Pennsylvania Ave. S.E., Washington, D.C. 20003.

Applefest Set For San Francisco, Boston, Anaheim

CHESTNUT HILL, Mass. — Applefest, the annual conference and exhibition showcasing Apple Computer, Inc. and compatible products, is slated to take place in Anaheim, Calif., April 15-17; in Boston, May 13-15; and in San Francisco, Oct. 28-30. This event is being jointly sponsored by Apple and Northeast Expositions, Inc.

The Apple shows feature over 300 displays and booths, in addition to seminars, panel discussions, workshops and software spotlights, according to sponsors.

Tickets for Applefest cost between $8 and $48, depending on conference selection. Further details are available from Northeast Expositions, 826 Boylston, St., Chestnut Hill, Mass. 02167.

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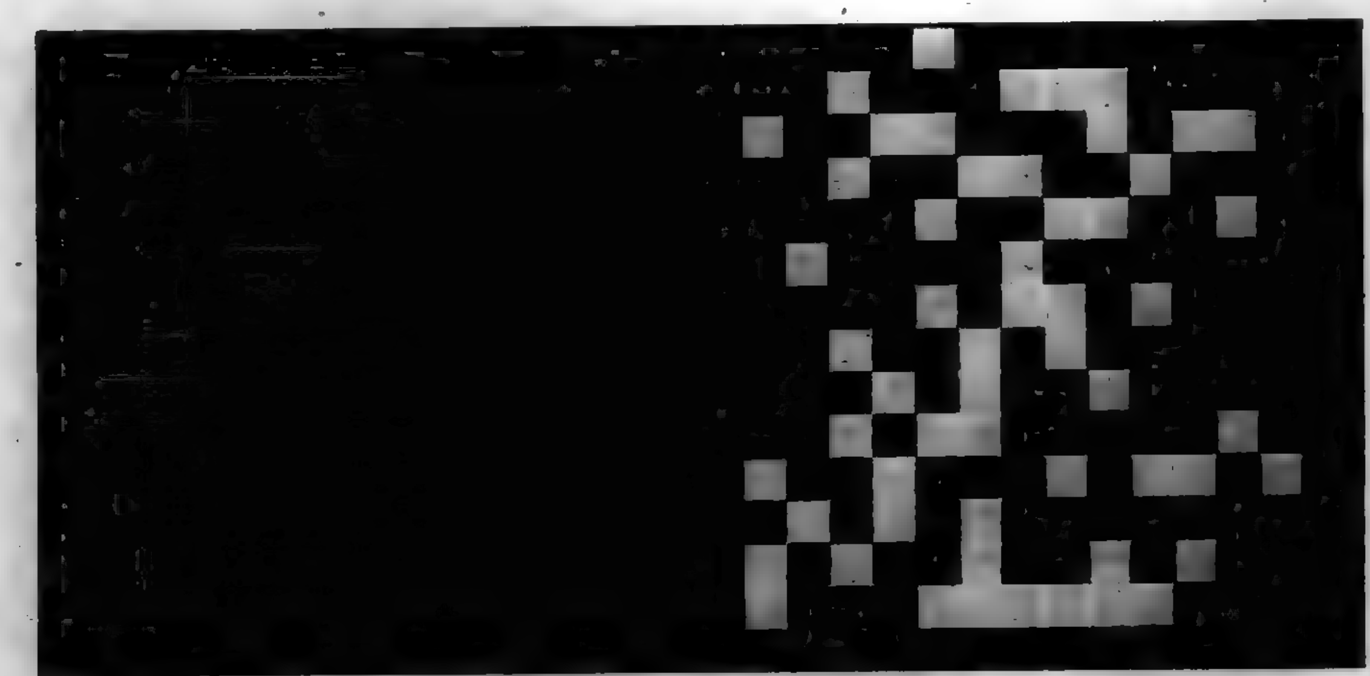

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Managers on the Move

GEORGE F. BORDER has been appointed senior vice-president of Corporate Information Resources for the Federal Home Loan Mortgage Corp., located in Washington, D.C. He will be responsible for the management of data processing, communications and office automation functions of the corporation, created by Congress in 1970 to develop and promote an active secondary mortgage market in residential loans.

Border formerly worked for Christian Broadcasting Network, Inc., as executive vice-president of finance and administration. Prior to that, he was director of information systems for the Copperweld Corp. and a manager of data processing for the Wheeling Pittsburgh Steel Corp. He served in the U.S. Air Force for 23 years.

Border has a bachelor's degree from Southwestern State, Okla., and a master's degree from George Washington University, Washington, D.C.

•••

KENNETH L. SCHARF has been appointed director of management information systems for Fisher Camuto Corp., located in Stamford, Conn.

Before joining Fisher Camuto, Scharf served as data processing manager at Hitachi Metals American for five years. Before that he was with Cornell Medical Center as manager of computer services at the hospital for special surgery.

Scharf holds an MBA degree from Fordham University and a BBA degree in Accounting and Data Processing from Pace University.

•••

PETER P. BLOZIS has been promoted to senior corporate director of information services and SHARON L. WHEELUS has been named corporate director of corporate systems in the Information Services Department of Harte-Hanks Communications, Inc. in San Antonio, Texas.

Prior to joining the company, Blozis was vice-president of the Information Services Division for H.J. Wilson, Inc. He joined Harte-Hanks in April 1981 as corporate director of information services.

Blozis earned both a bachelor's degree and a master's degree in computer science from Purdue University, Ind., and an MBA degree from the University of Rochester, N.Y.

Before joining Harte-Hanks, Wheelus was a senior analyst/programmer for Central Processing Center. She joined Harte-Hanks in July 1977 as an analyst/programmer, later serving as senior analyst/programmer and supervisor of corporate systems.

Wheelus is working on a bachelor's degree in accounting from the University of Texas at San Antonio.

George F. Border

Kenneth L. Scharf

Peter P. Blozis

Sharon L. Wheelus

RTUA Summer Conference To Focus on Automation

ST. LOUIS — "Automation: The Key to Information Processing Productivity" is the theme of the 1983 Recognition Technologies Users Association (RTUA) Summer Conference, which will take place here July 17-20.

Thomas Kamp, vice-chairman of business and technology at Control Data Corp., will keynote the RTUA conference.

Other speakers include Bill Moore, president and chief executive officer of Recognition Equipment, Inc; Bill Carter, vice-president and general manager of CAM-I; Capt. Grace Murray Hopper, U.S. Navy Reserves; and Robert Deffeyes, president and chief executive officer of Graham Magnetics, Inc.

Conference registration is $280 for member companies and $350 for nonmember companies; admittance to the exhibition only is free. Further details are available from RTUA through P.O. Box 2016, Manchester Center, Vt. 05255.

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Bank Goes In-House to Cut Processing Costs

LOWELL, Mass. — A thrift institution here has cut paper processing costs and boosted response time by switching to an in-house system with customized software.

The Lowell Five Cent Savings Bank is an approximately $200 million bank whose earnings consistently rank among the top 10% of Massachusetts mutual savings banks. One of the first such Massachusetts banks to use a computer service bureau in 1972, the bank last year decided it needed to gain control over its processing costs and service support, according to Robert Caruso, assistant vice-president of the bank.

"We were just one bank out of 50 to 100 using the Service Management Computer Corp. [in Boston], and we were getting a canned package as it existed," Caruso explained. "We felt it would be more cost-effective to go in-house." Other problems cited by Caruso included a need for software to handle simple interest loans and a poor response time during the bank's busiest time periods.

Meeting Various Needs

"From the beginning, we knew that the applications package we selected would have to not only meet our transaction processing needs, but also allow on-line management and financial reporting," he added.

Although the bank had built a computer room in 1978 and was using NCR Corp. 270 teleterminals, it did not have its own DP department. Because it was new to computing, management decided to buy a package to avoid having to hire "five to 10 to 15 programmers like some of the larger banks," Caruso said. Instead, the Lowell Five hired a DP manager to work with consultants from Atlantic Data Services (ADS) of Quincy, Mass., a consulting and software development company specializing in banking applications.

ADS worked up a complete request for proposal, including technical specifications such as VSE, Cobol and compatibility with the bank's NCR Corp. 270 teleterminals. ADS President Robert Howe explained that most bank applications are written in assembler, and the Lowell Five needed Cobol. Consultants from ADS narrowed a field of 15 to 20 prospective packages down to three, and the Lowell Five decided to purchase an IBM OS package developed by the former New York Bank for Savings.

Even though the package provided 90% of the banking features needed, it presented three problems. It did not have an integrated general ledger system; it had to be modified to comply with state banking policy and; and it required a major conversion to run in a DOS/VSE CICS environment, Howe said. The conversion process took 12 months, during which time ADS developed new proprietary software that the bank needed to compete, such as the general ledger package and a simple interest loan package. The system also includes an IBM processor control program, on-line history, up-to-the-minute transaction activity by branch, an on-line memo of each account and several levels of security and cash control.

Caruso estimated that 300 enhancements were made to the package prior to going on-line in June. The bank is in the process of training a bank employee to handle future programming needs.

The bank went to IBM for its hardware because it felt the industry giant had "the best support, prices and maintenance to meet our needs," Caruso said. The Lowell Five chose the 4331 system, with 1M byte of memory, mainly for its cost benefits, even though the firm knew it would have to modify its software to run on the machine, Howe said.

"As far as the branch operations were concerned, the most immediate benefit was great response time. Also, the information available on this system is tremendous," Caruso said.

As an example, he outlined the manual paper shuffle formerly used to follow an inquiry into a loan account. "We now have a complete online account history and can provide an immediate response to an inquiry. As a result, we are providing customers with better service."

Caruso admitted initial employee resistance was strong, but noted the bank was able to "get over that hump" via a policy of instituting major change from the top to the bottom rather than the from the bottom to the top. Plus, the bank decided to stay with its NCR teleterminals, thereby lessening the impact of the transition for employees.

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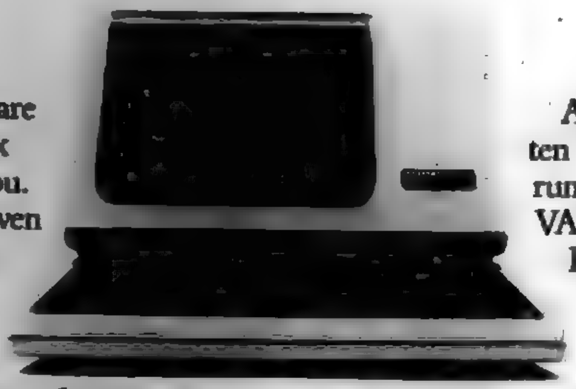

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Changes From IBM to NCR

Shipper Sails With System Upgrade

NEW YORK — To reap the expected benefits of its $320 million capital investment program, a Greek shipping company has upgraded its information management system with a system that reportedly allows it to track better its worldwide operations and reduce significantly its communications costs.

Because its DP abilities were limited by the capacity of its IBM System/3 and System/34, Hellenic Lines Ltd. purchased two NCR Corp. 8555 MP computers running under the VRX operating system to go along with a customized data base system. The new system is expected to cut the company's $25 million a year container leasing and damage costs by 10% and to expand its DP capabilities.

"We think the system also will be less labor-intensive, even though our volume is climbing," management information systems director Zeljko Gregov said. "It is expected to reduce cargo rating and billing errors, improve our service capabilities and our image with shippers and streamline port operations. But more importantly, it will give management up-to-date data that it can use to make sound booking and voyage decisions."

Gregov said the new system is a distributive one, requiring users to enter and verify their own data and accept responsibility for the output. Currently, staffers and booking agents use 69 NCR 796-501 CRT terminals and 33 NCR 6440 printers to access the data base.

Before it had the NCR system, Hellenic relied on the System/3 to print manifests and the System/34 to track its container vessels. "Limited capacity made the System/3 little more than a printing press that produced detailed charge summaries," Gregov said.

"For container tracking, information was received by telex and entered by keypunch operators. At best, this gave us data two to three weeks behind container movement."

In trying to decide from which vendor to buy its DP equipment, Gregov said it came down to selecting either IBM or NCR. After taking all the variables into account, Gregov decided to go with NCR because of its Total data base system and Tranpro software.

"Total is much less complex and costly than the alternatives we examined," Gregov asserted. "Because it provides an integrated system, Total allows us to update the entire system with just one record update. It also makes it easy to maintain programs already written. I didn't want my staff to spend 50% of its time rewriting programs," he said.

To appreciate what the data base has meant to Hellenic, Gregov asserted that one must know something about the advantages, costs and of containerized shipping.

Dual Advantages

Hellenic is converting three of its existing cargo ships to hold up to 1,200 containers each. As Gregov explains it, the ability to carry containers offers advantages to both shipping lines and their customers. One of the advantages to shippers is that they can load containers at their own factories or warehouses and seal them. The containers can then be transported by either truck, train or ship to their final destinations. Cargo in containers is also easier and faster to load than loose cargo, reducing carrier handling expenses as well as port loading and unloading time.

However, such benefits can only be realized if certain information problems, such as documentation, are solved. "Without customs documentation, a ship isn't allowed to enter port," Gregov noted. "We used to have difficulty getting shippers' bills of lading and preparing, processing and transmitting documents to meet these demands. With our new system, the documentation is always ready in advance," he added.

While the system has provided its benefits, bringing it up has not been free of problems. One of those problems has been obtaining telephone lines in some overseas locations.

"In the U.S., telecommunications are excellent and we've had few problems. In Europe and the Middle East, however, we had to fight to get lines. Anyone considering an on-line, international network should start trying to obtain lines at least a year in advance," Gregov counseled.

Gregov noted that long-distance phone lines — not DP equipment — represent the biggest system expense. "Telex was costing us $3 million annually," he pointed out. "By transferring 41% of telex traffic to our message switching system, we will pay for the lines. Everything above that is profit."

DBMS Newsletter To Debut in May

CHERRY HILL, N.J. — "Data Base Product Reports," a newsletter on data base management systems (DBMS), will be published beginning in May by Management Information Corp.

The newsletter will contain evaluations and analyses of DBMS implemented on mainframes, microcomputers and minicomputers. The publication will also contain a description of DBMS, a section on what to look for in a DBMS package, a list of available software systems and a monthly evaluation of new products.

Annual subscription orders received before May cost $195; after May, a one-year subscription will cost $225.

More information is available from the vendor at 140 Barclay Center, Cherry Hill, N.J. 08034.

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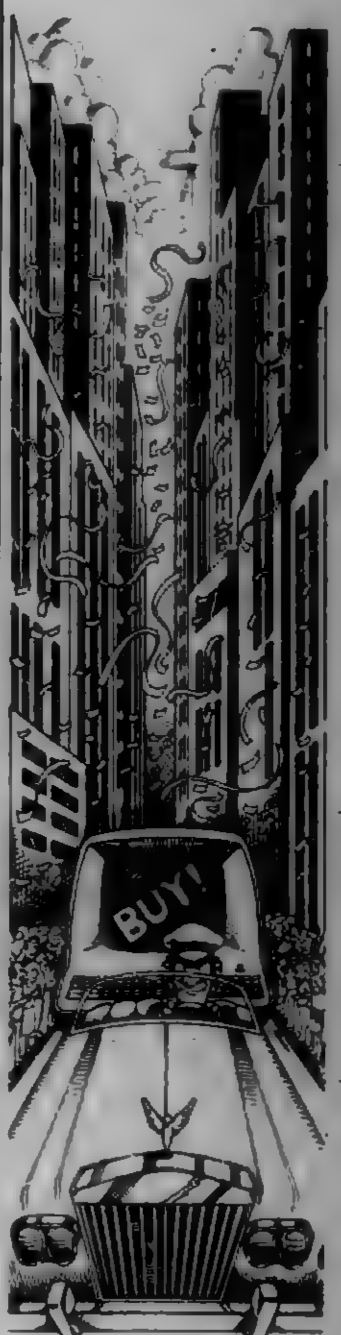

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Firm Solves Space Problem With Dasd Tool

DENVILLE, N.J. — When a manufacturing firm here began to run out of room for additional disk drives, it decided the only solution was software that could manage its direct access storage device (Dasd) usage.

The result has been more efficient control of usage of Dasd resources, as well as the development of standards for this usage, Computer Operations Manager Paul Ashford reported.

Over the last four years, International Paper has exchanged 32 IBM 3330s for an installation of 110 IBM 3350s. "We were in such a rush to meet the demands of the data center that we were willing to ignore possibly inefficient or illegal uses of our equipment," Ashford said. "It became common for us to run Dasd nightly and shut down production to run a compress on the packs to create enough contiguous space," he continued.

The problem became even more severe as the data center continued to grow. The short-term solution of pack compression no longer helped, nor did the addition of more packs.

"To give you an idea of how severe our space problem was, we even ran out of floor space for any more packs," Ashford said.

Search for Alternatives

This created an unpleasant situation for the computer operations manager. Users were unhappy because they had trouble logging on, and management was unhappy with the high rerun costs and dissatisfied users. It was at this point that Ashford and his staff began looking for alternative ways of managing their Dasd environment.

"Our first step was to initiate a program which would tell us how our packs were being used," he said. "We could then plan a project which would help control this usage," the computer operations manager said.

Ashford looked at several software products, but decided on Pac/Master from CGA Software Products Group, Inc. because it met the firm's established criteria and fit into its overall Dasd management plan.

With Pac/Master in place, he was able to obtain a detailed report on how his disks were being utilized.

"We started by examining the disks to understand current usage techniques. We found that our disks were being used in any convenient way by any programmer who felt that he needed a disk file. Files were grossly over-allocated, poorly blocked and worst of all, many disk resident files were never even used," Ashford said.

When presented with evidence of how its Dasd resources were being used, the firm's management decided to attack the problem of Dasd management head-on. "After instructing our staff on the proper use of Dasd, we set standards and issued warning to our users during the first two weeks," Ashford explained. "The third week we enforced them.

"We explained to our users that we would provide the Dasd space they were crying for, but they were going to have to live by the standards we established," he continued. Under this arrangement, International Paper has been able to control its disk space to the point of achieving 40% or more free space pool, he reported.

These gains led to further tuning of the software. "We wanted to retain access to low-activity sequential files while storing them on a lower cost medium and releasing expensive disk space," Ashford explained.

The data center found that its current computer capabilities would enable them to do this. "We started using the Movet function of Pac/Master, which stacks cataloged sequential files on tape with proper recataloging while scratching the original disk file," he maintained.

Recovering Tracks

After the first enforcement of a standard using the Movet function, Ashford said his group was able to recover 240,000 tracks. Subsequent enforcements have re-claimed an additional 80,000 tracks.

"One user had reached the point of using 94,000 tracks by the time we instituted the Movet function," he maintained.

"One month after Movet was in place, this single user's disk requirements dropped to only 30,000 tracks. Since that time, his disk requirements have dropped to only 16,000 tracks. This is only over the course of six months," he said.

In addition, Ashford is able to examine the user's record of track usage from PAC/Master's history file and feed this information into an SAS Institute, Inc. Statistical Analysis System program.

"This flexibility allows me to analyze very specific user information as it relates to disk usage," the manager maintained.

With its Dasd management now under control, International Paper ironically now has the available floor space for more machines if it wants them. "Because we've drastically reduced our disk requirements, we've sent a number of spindles back," he explained.

"Besides keeping our hardware costs down by not buying any more machines, we've been able to reduce our hardware budget by eliminating any unnecessary disks," the computer operations manager continued.

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Agency Lists Models' Assets

Mini Helps Shape Fashion Success

By Jim Bartimo
CW Staff

NEW YORK — Most computer users are accustomed to dealing with a lot of figures, but booking agents at the nation's largest modeling agency deal with some 245 more familiar figures — those of the nation's top 170 female and 75 male models.

At Ford Models, Inc., the speed with which a model is booked to do an ad and an accurate record of his or her physical attributes have been identified as two important factors for success.

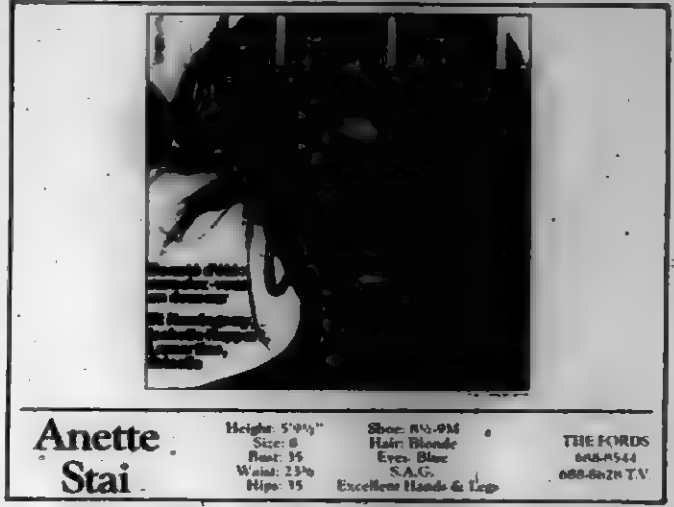
Who's Free

An Ultimate Corp. system comprised of a Honeywell, Inc. Level 6 minicomputer enhanced with a Pick & Associates, Inc. operating system "helps booking agents get charts on the models in front of them very quickly and helps them find who's free and who's not," the agency's president, Jerry Ford, said in a recent interview.

"We're in a business where people call up and ask, 'Is Christy Brinkley free?' or 'Is Cheryl Tiegs free?' Under the old system, it could take two hours to find who's free. Charts were always getting mislaid under someone's elbow," he said.

Now, "more than one person can look at the same chart, and the booking agents can handle two clients at a time," Ford said.

While scheduling has been improved, a more interesting application has also been automated. Under the old system, the models' physical attributes were rated on paper charts with descriptive notations such as "excellent legs."



Anette Stai

Height: 5'9½"
Size: 8
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Hips: 35

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The vital statistics of 170 female and 75 male models are maintained on-line at Ford Models, Inc., where 32 agents can easily get at it for bookings. Also included in the data base are the activities at which each model excels and the model's schedule.

The model's measurements were also noted, along with activities in which the model excelled, such as hiking, skating or skiing.

Booking Agents

All of this information — necessary when a client calls for a model who can perform certain physical activities for a specific type of advertisement — has been put into a data base that 32 booking agents can call up at any time on their own terminals.

"We have their characteristics rated from 0 to 9," Ford said. "Instead of rating legs, for instance, as 'very good,' the new system would say '7.' "

Or as one Ford employee put it, "It works like a travel agency, but instead of seat selection, we have body parts."

Ford started his modeling agency in 1946 and has wanted to install a computer system for the last 20 years.

"I had to wait for the cost to come down," he said. "Even at this point, no other agency can afford a system like this, and it will take a few years to know if it's cost-justified."

According to Ford, with software and enhancements, the system will end up costing the agency $175,000.

Industry Follower

Ford has been following the computer industry closely to identify ways to improve his agency. Before installing the Honeywell system, he programmed some elementary booking software on his Radio Shack TRS-80 at home.

Now, spoiled by the 250M bytes on the Honeywell system and specially designed order entry software from The Courage Group of New York, Ford is able to use a home terminal to dial into the agency's data base system.

The year-old system's response time tends to slow down from 4 to 4:30 in the afternoon — a daily peak use period when clients book models for the following morning.

Annual peak periods are March, April, August and September when spring, summer, fall and Chistmas ads are shot, according to Ford.

He said that when the system was installed, booking agents exhibited the usual user resistance. Now, however, "I don't think one person would let me take it away from them and make them go back to paper and pencil," Ford said.

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Iris to Publish DEC Directory

WARWICK, R.I. — The Independent RSTS Users Society (Irus) has announced plans to publish a directory of Digital Equipment Corp. users and vendors. Scheduled to go to press June 1, the directory reportedly will be a source of hard information regarding who is out there and who uses what equipment and software.

It also will include listings of vendors, software and services.

Although intended primarily for Irus members and available to them at no charge, the directory will be made available to nonmembers for a yet undetermined price.

More information on the directory is available from Irus, Suite 4, 3657 Post Road, Warwick, R.I. 02886.

With Other Academic Institutions

Second System Lets College Share Software

CLARKSVILLE, Tenn. — Having successfully launched its computer science program with a 32-bit system four years ago, Austin Peay State University is about to add a second 32-bit system so it can share software programs with other academic institutions.

Austin Peay purchased its first Digital Equipment Corp. VAX-11/780 in 1979 to handle academic applications such as student programming and research. The system complemented the school's 14-year-old, secondhand IBM 360, which was dedicated to administrative applications. With the second VAX-11 now scheduled to take over the 360's administrative applications, the school has been able to add more terminals for administrative applications.

"Information needed by various administrative departments can be entered on-site by the person needing the information. This eliminates a computer center staff member punching in information, thus eliminating greater chance of error," noted Charles Wall, director of computer services.

Wall added that if errors do occur, they can be corrected more efficiently because users' corrections will be carried throughout the system.

DEC is donating six graphics terminals to the university to go along with the new VAX-11. They will be used to create charts and graphs for subjects as wide-ranging as chemistry, biology, marketing and psychology, Wall said.

The growing number of new applications has forced the university to increase significantly its number of terminals. "We started out at zero terminals, then acquired 15 to use with the IBM 360. We now have more than 80 terminals on campus for use by students, faculty and staff," Wall said.

Shares Software

Besides being an administrative boon, the second VAX-11 machine's ability to share software with other schools will be helpful to Austin Peay students as well, according to Wall. "They will have more than a dozen computer languages available because schools are buying programs to complement but not unnecessarily duplicate one another," he explained.

Austin Peay officials claim their school's decision to go with the VAX-11/780 four years ago, which was the first VAX-11 system installed in Tennessee, has influenced the State Board of Regents to recommend that other state universities and community colleges install VAX-11 systems as well.

Replacing the 360 with the second VAX-11/780 is not without its installation problems, however. According to Wall, the process involves more than just unplugging one computer and plugging in another. Wall will have to incorporate an improved cooling system, increase the number of programs and retrain his computer staff to maintain properly the new system.

Data Dictionary, DBMS Guides Out From QED

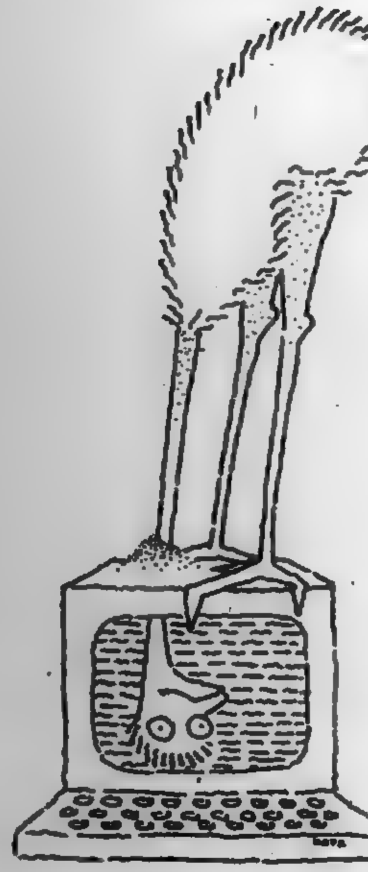
WELLESLEY, Mass. — QED Information Sciences, Inc. has published a data dictionary evaluation guide and a data base management systems (DBMS) evaluation guide.

"Information Resource/Data Dictionary Systems," by Henry Lefkovits, Edgar Sibley and Sandra Lefkovits, presents an in-depth description of the current uses and features of today's data dictionary systems.

Systems described in detail include the following: IBM's DB/DC Dictionary; MSP, Inc.'s Data Manager; Cullinet Software, Inc.'s IDD; Applied Data Research, Inc.'s Data Dictionary; University Computing Co.'s UCC 10; and Haverly Systems, Inc.'s DCS.

"Data Base Management Systems for the Eighties" by Shaku Atre treats the following: IBM's IMS/VS and SQL/DS; Cincom Systems, Inc.'s Total; Software AG of North America, Inc.'s Adabas; Intel Systems Corp.'s System 2000/20; Applied Data Research's Datacom/DM; Computer Corp. of America's Model 204; and Cullinet Software's IDMS.

Each report costs $95. QED Information Sciences can be reached through P.O. Box 181, 180 Linden St., Wellesley, Mass. 02181.



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Free-Lance Programmers Issue Newsletter

VIENNA, Va. — The National Association of Free-Lance Programmers (NAFLP) has begun publishing "Software Market Letter," a monthly newsletter for its members.

The newsletter is intended to provide free-lance programmers with software marketing information and advice, including the type of software in demand, how and where to sell programs and how to obtain free-lance programming contracts.

Included in each issue is a directory of software buyers as well as "informative and tutorial articles," such as how to sell software directly, how to save on expenses and taxes and how to reduce business liabilities.

The annual cost of a membership in NAFLP, which includes subscription to the newsletter, is $48. The association can be reached at Box 813P, Vienna, Va. 22180.

Cray Research's Loftis To Keynote AWC Meet

ANAHEIM, Calif. — Margret Loftis, vice-president of software development for Cray Research, Inc., will keynote the Association for Women in Computing's (AWC) second annual national conference here May 15. Loftis led development of the first Cray operating system delivered to the National Center for Atmospheric Research at Boulder, Colo.

The theme for the conference will be "Women Emerging in the Information Age." Open to the public, it costs $30, but there is a $5 discount before April 15.

More information about the conference is available from Kathy Bruce, 1317 Church St., San Francisco, Calif. 94114.

Schools, Wang to Offer Summer Tech Classes

Summer classes are being offered by the Eastern and Western Institute in Computer Science through the Wang Institute in Tyngsboro, Mass., and the University of Santa Clara and Stanford University in California.

Classes at the Wang Institute include compiler construction, managing and engineering software, interactive computer graphics, data models and user interfaces, software management decisions and implementation of relational systems.

The University of Santa Clara is offering a course in data base management; both the Wang Institute and the University of Santa Clara are offering courses in operating systems and software engineering principles.

Courses at Stanford include data base management systems, distributed systems, compiler construction/programming language translation, theory and practice of expert systems and code optimization and generation.

The four-day classes run from May through August. Enrollment for most classes is $850.

More information on the Massachusetts classes is available from the Wang Institute of Graduate Studies, Tyng Road, Tyngsboro, Mass. 01879; information on western classes is available from the Western Institute in Computer Science, P.O. Box 1238, Magalia, Calif. 95954.

Guide Lists Education For WP

WILLOW GROVE, Pa. — The International Information/Word Processing Association (IWP) has published an enlarged and updated version of its *Reference Guide to Information/Word Processing Education.*

Included in the publication are sections covering sample word processing curricula, methods of integrating word processing into present courses, notes on professional writing, sources of federal funding for information/word processing equipment, institutions offering word processing education and a word processing supervision/management curriculum.

The 160-page reference guide costs $10 plus $2.50 postage and handling from 1015 N. York Road, Willow Grove, Pa. 19090.

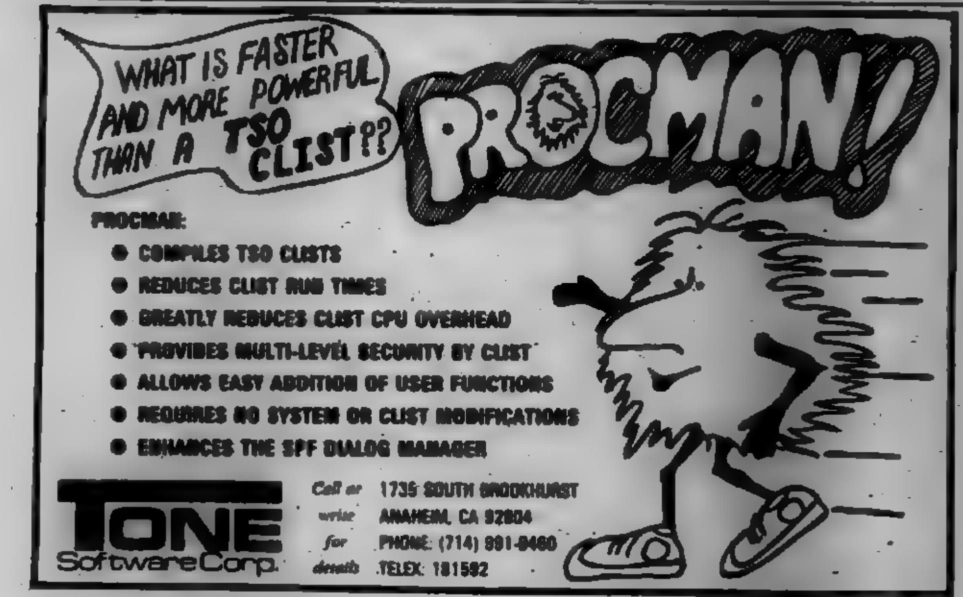
Unix Course Video-Based

CHICAGO — The Computer Technology Group of Telemedia, Inc. has announced a video-based training course on Bell Laboratories' Unix.

Called "Unix Fundamentals," the course's 15 video modules cover topics including communicating with the system, communicating with other users, files, 'ed,' pathnames, directory commands, commands, I/O, command lines, file access permissions, file name generation and advanced 'ed.'

Over 30 of the most frequently used commands are explained and illustrated, according to a spokesman. Screen examples are shown, followed by hands-on exercises.

The package of 15 modules costs $5,250 from Telemedia, 310 S. Michigan Ave., Chicago, Ill. 60604.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TeleVideo's full line of 8- and 16-bit microcomputers is in stock at DJC. Both single- and multi-user systems feature dedicated CPU and RAM for each station, resulting in true distributed parallel processing, even for separate applications. These CP/M-based systems, including the new 803, open the broadest selection of application software to your business.

TeleVideo also offers a variety of mainframe access protocol emulation, combining remote distributed processing to IBM hosts with locally executed CP/M applications.

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Send for DJC's terminal comparison chart, as seen in Computer Decisions.

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Application Development Tool Speeds Sales Forecasting for Electronics Firm

CANOGA PARK, Calif. — The electronics firm's management systems staff bore the full brunt of procedures that eight years ago were far from fully automated. Each month, the staff faced the task of manually recording, consolidating and verifying the sales forecast figures for seven separate divisions. After the forecasts, the staff had to repeat the process with actuals.

This effort took on heroic proportions considering the size of Hughes Aircraft Co., a high-technology electronics firm, and the volume of data involved. In 1981, annual sales totaled $3.1 billion with a payroll of $1.3 billion for 60,000 employees worldwide.

"Before we automated our procedures," recalled Leno Petteys, management systems specialist in charge of financial applications, "the consolidation of sales figures for seven divisions was a massive effort. We had to work all the figures up on spreadsheets, then telephone the data to corporate [headquarters], where they would manually consolidate all the numbers. Since there wasn't time to use the mail, data verification had to be done on the phone as well.

"It finally became obvious: We had to computerize,"

Chosen for Flexibility

The DP staff began developing a relational data base management system using Cortex Corp.'s Inform applications development system. According to Richard Allen, the data base analyst who wrote Hughes' first Inform programs, the development tool was selected because it was able to use table data bases to build data relationships. It also had the flexibility offered by global variables and the self-contained language that made for ease of use.

Allen said these features have withstood the test of time and have been coupled with a number of enhancements that make the tool an appropriate data management software system.

As Inform was being developed at the time Hughes began using it, Allen's department was able to receive enhancements tailored to its individual needs. Included in those enhancements, he said, are a greater ease in working between users, a processing capability that allows data to be written directly to the end of a file and the ability to perform a direct-access table search that eliminates the need for expensive sequential processing.

Inform also allows the creation of command files that enable nontechnical personnel to perform DP functions.

Hughes' personnel has since been able to build its own table of financial data that an Inform program can quickly access, verify and consoldiate with other related tables, Allen said. The task of writing programs was simplified by Allen's option to use global variables — information that can be stored outside a data base and used whenever a given processing situation requires it.

Allen said it is Inform's ability to use tables to create a relational operating environment that makes it so powerful, while Petteys stressed its ease of use, saying it is "simpler than Basic.

"It doesn't require any training; it's that easy to use," Petteys said. "In fact, I have only two or three people here who know the Inform commands. Our early programs, which are seven years old now, are basically self-driven. And the new procedures we have automated can be easily handled by nontechnical personnel."

Guide Details CAD/CAM

ARLINGTON, Texas — The Office of Continuing Education of the University of Texas here is offering a matrix of about 190 computer-aided design and manufacturing (CAD/CAM) system attributes from approximately 40 vendors.

The 400-page *CAD/CAM Presentation Resource Guide* covers CAD/CAM graphics systems, group technology, computer-aided process planning, numerical control, manufacturing management systems, robotics and automated storage and retrieval systems, the university said.

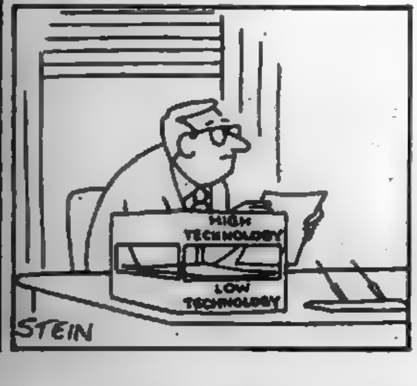
The publication costs $125 and can be obtained by writing to the Office of Continuing Education, University of Texas, P.O. Box 13635, Arlington, Texas 76013.

Micro Course Gets '83 Training Award

CHICAGO — Arthur Andersen & Co.'s "Introduction to Microcomputers/Using Microcomputers in the Business Environment" course received the first Exemplary Training Program for 1983 award at the recent Association for Educational Communications and Technology convention.

The consulting firm's two-day training program is periodically conducted in major cities around the country as well as in-house.

Further details on the program can be obtained from Arthur Andersen at 69 W. Washington St., Chicago, Ill. 60602.



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Records Manager Supports Utility's Growth

MIAMI — In the utility industry, an effective records management system can not only help improve productivity, but can keep overall costs down.

Take, for example, Florida Power & Light Co. (FPL) here. FPL deals with a staggering amount of paperwork because of its complex accounting procedures and reporting duties resulting from stringent government regulations. The utility, which has 473 work sites and serves 2.2 million customers, must often produce and retrieve these records instantaneously.

"We have a lot of people who, because of the many regulations, have to handle a lot of paper. We often find roughly 20% to 30% of a department's paperwork can be thrown away. It's mainly duplicate copies, information type copies," Dennis Morgan, FPL's manager of corporate records services, explained. "Another 20% to 25% we can consign to low-cost storage areas."

FPL hopes to make jobs less labor-intensive "by providing information in the fastest way possible," Morgan said. "I foresee the time when many people working with information will have their own terminals at their desks where they can key in and get the data right off the CRT rather than run all over the department looking for it."

To reach that point, however, "you have to first establish the data base, establish retentions, film the records, index them properly and fit them into the system for quick, accurate retrieval."

For FPL, 1978 was the year to begin attacking its paper problem (it still sees itself in the "early stages of [the] process"). After determining the feasibility of a records retention program and the cost benefits of a corporate, centralized micrographics facility, FPL turned to Florida Computer, Inc. (FCI) here, a software development firm.

Consultations resulted in a software system that interfaces with FPL's 3M Corp. 16mm reader-printers, a Digital Equipment Corp. PDP-11/44 minicomputer and VT100 CRT terminals for computer-assisted retrieval and duplication of microfilmed documents. FPL had acquired DEC equipment primarily because DEC offered local service for both hardware and the digital software, Eugene Sands, senior records analyst, explained.

FCI's software includes a data entry subsystem, query language and report writer. Since the software also works with fiche retrieval units, requires no hardware modifications and is compatible with most DEC operating systems as well as 3M and Kodak Corp. equipment, the package offered a great degree of flexibility, according to FCI President John H. Wright.

In an attempt to unify the FPL records system, Morgan is directing a five-year records plan including a uniform filing system, relative index, retention schedule and vital records programs for the entire company.

Rather than trying to "retrofit" the millions of microfilmed company records, Morgan's initial objective is to establish new department records systems that will handle the normal 10% to 15% annual record growth rate. One key area of activity is the nuclear division, which makes the most rigorous records demands on the utility.

The state's three operating nuclear power plants now have more than two million records filmed and indexed with an annual increase of 25% in 1980. Another million await microfilming at a plant under construction.

Approximately two 16mm cartridge rolls of 2,500 frames each, along with the 3M automatic page search units, are being used weekly for filming at the three operating plants. This allows for microfilming of about 5,000 pieces of paper per week per plant.

FPL is just beginning to move into the computer output microfiche capabilities provided in the FCI software as a backup to the on-line computer-assisted retrieval.

Catalog Describes Micro Software Uses

CHICAGO — The Software Division of Semiconductor Specialists, Inc. has published a free catalog describing systems and applications software for microcomputers.

The catalog includes a classification and description of available products and a listing by operating systems and formats. Included is software for Digital Research, Inc. CP/M and CP/M-86 and for the IBM PC-DOS operating systems.

Copies are available from Semiconductor Specialists, P.O. Box 66125, O'Hare International Airport, Chicago, Ill. 60666.

"Improve performance, save time, cut costs by developing on-line applications with CYX"

Norfolk and Western Railway's CYX-based Norfolk Coal Inventory System works out the complex logistics of preparing and routing coal orders, helping the NW to break monthly coal dumping records.

By using CYX to build the Fully Integrated Reservation System for Travel (FIRST), Tymshare, Inc. cut months out of their production schedule — time that would have been spent developing their own untested transaction processing system.

Union Carbide's new Material Acquisitions Data Processing System is relying on CYX to economically distribute transaction processing capabilities to chemical plants across the country.

And what CYX did for these companies, it can do for you. Almost any on-line application — from materials management to interbank funds transfer — can be developed more efficiently on CYX.

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System Manages Growing Accounts

Builder Puts Credit Collection Faith in Software

SEATTLE — When annual sales at Northwest Builders Hardware jumped from $300,000 to $8 million, the firm's officials decided it was time to look for a computer system to manage credit collections and accounts payable functions.

A wholesaler of building supplies for large contractors that construct high-rise buildings, schools and multihousing projects, Northwest Builders wanted a system that would help it collect outstanding debts and allow it to format its own accounting reports. It also wanted a system that would enable it to prepare quickly bids for large materials contracts.

Operating on the theory that strong software is more important than hardware, Northwest Builders purchased a specialized system developed by TOM Software, Inc. and designed to operate on Wang Laboratories, Inc. hardware. Northwest Builders' configuration consists of a Wang 2200 MVP processor with 384K bytes of main memory, 83.8M bytes of disk storage, a 300 line/min printer, three matrix printers and a daisywheel printer. The firm recently added two remote job entry terminals to the system.

The software includes TOM's Distributor Business Management System, the firm's Data 3500 word processing package and its Record Management System package. The distributor system is comprised of modules for accounts receivable, order entry, sales analysis, bills of materials, costing, inventory control, accounts payable, purchase orders, general ledger and fixed assets accounting.

Before buying a system, Northwest Builders developed an outline of the features it wanted. According to Northwest Builders Vice-President Bob Hubbs, the system configured by TOM software met the firm's needs and offered additional flexibility and word processing features.

Word Processing Features

The word processing features were particularly useful in securing a $300,000 Saudi Arabian contract. "Our bid packet, with itemized quotations and other materials, was 40 pages. And we went through nearly 50 revisions as they requested changes. With every change, our customer wanted five bound documents," Hubbs said.

"Because it was set up on our computer system, we were able to respond overnight. Delivery time was critical to our customer, and we were awarded the contract even though our prices were not necessarily low all the way through," Hubbs maintained.

The system has also improved Northwest Builders' ability to take advantage of discounts available by paying early on some purchases. Hubbs explained that when items are entered into the system, the date on which a discount offer expires is also entered, making it easier to spot those accounts.

The accounting system also allows Northwest Builders to develop specialized accounting files. For example, Hubbs said, balance sheets can be designed with varying column widths and headings to accommodate detailed accounts, according to Hubbs.

"We didn't have to make our balance sheet conform to someone elses' idea of how we should run our business," Hubbs said.

"For a small business to have a workable and meaningful computer installation, you need someone who speaks for the ownership of the company and can make independent decisions," Hubbs continued. "That doesn't mean they have to manage all the input, but they have to serve as coordinator of the program and take an interest, as well as understand what the system is doing and how it does it.

"The computer installation is worth the investment of management and commitment. Installation of the right software and hardware system is probably the key to the future of your company," Hubbs concluded.

AIM Releases 1982 Survey On Data Centers

CHICAGO — The Association of Information Managers for Financial Institutions (AIM) has released the 1982 "Thrift Institution Automation Survey." The 300-page survey describes 536 data centers serving thrift institutions nationwide.

The survey includes hardware, software, staffing and applications information about in-house data centers and independent service bureaus that provide on-line deposit and lending services.

Seven cross-references categorize the survey alphabetically, geographically and by number of accounts received. Manufacturers and models of CPUs, automated teller machines and minicomputers are also categorized, a spokesman said.

The survey costs $50 for AIM members and $200 for nonmembers. AIM is a division of Financial Managers Society for Savings Institutions, Inc., 111 E. Wacker Drive, Chicago, Ill. 60601.

Administrator Named for Ansi

NEW YORK — Joan Gardulski has been named program administrator for the Information Processing Systems Department of the American National Standards Institute (Ansi).

Gardulski will administer the secretariats of a number of subcommittees of the International Standards Organization (ISO), a major international body. Ansi is the U.S. member of ISO.

Gardulski will be responsible for four subcommittees of ISO Technical Committee 97, Information Processing Systems: programming languages, flexible magnetic media, instrumentation tape and representation of data elements.

In addition, she assumes responsibility for a subcommittee on data elements and interchange formats of ISO Technical Committee 154, Documents and Data Elements in Administration, Commerce and Industry. She will also provide staff support to Ansi's Information Systems Standards Board.

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Firm Builds Up Profits With In-House System

EL SEGUNDO, Calif. — The need was apparent — to provide timely and accurate computer printouts on commercial building projects to branch offices and to computerize operations throughout the home office.

But the question for Continental Development Corp. rested in what means should be chosen to accomplish these ends: in-house computer or service bureau?

According to Charles Robbins, controller for the commercial building development firm, the San Francisco office needed to access special computer reports on projects and property management from the home office here.

The service bureau concept gained initial favor, according to Robbins. But after carefully researching methods of automating his office and seeing "at least a dozen" other vendors before making his final package selection, Robbins recommended that the building development firm buy a Basic Four System 410 from Basic Four Information Systems Division of Management Assistance, Inc. (MAI).

Combination of Support

"What MAI/Basic Four offered was a combination of hardware and software support that I just didn't find offered by other computer manufacturers," Robbins said.

"In the beginning, I pushed for a service bureau, but the MAI presentation was very impressive and I changed my mind," Robbins continued.

In addition to its use in project management, the Basic Four minicomputer system is used in property management, word processing and general accounting applications including check preparation, according to Robbins.

End-of-the-month financial statements that formerly took two weeks to prepare manually now take a day, and project managers can immediately access information on job costs, information that used to take two or three days to obtain, according to Robbins. And the reports are generated more accurately than before, the controller maintained.

Installed 18 months ago at a cost of about $85,000, the system includes four CRT display terminals, 120K bytes of main memory, a high-speed 58M-byte fixed disk drive, a magnetic tape cartridge drive and a bidirectional printer.

Chose Four Modules

Continental chose four of the software modules that are developed and distributed by MAI Applications Software Corp., including general ledger, property management, job cost and accounts payable.

The company has seven people trained to use the systems. Robbins, who has a terminal on his desk, maintained, "I'd worked with a computer before, but it was primarily through a service bureau, not with a terminal on my desk.

"The system is easy to use and the application software prompts you through what needs to be done by giving the operator simple commands," he added.

Robbins said the primary benefit of his in-house system has been enhanced project control, resulting in an "appreciable" improvement in the firm's profits. The increased profit potential, he said, "easily covers the cost of conversion many times over."

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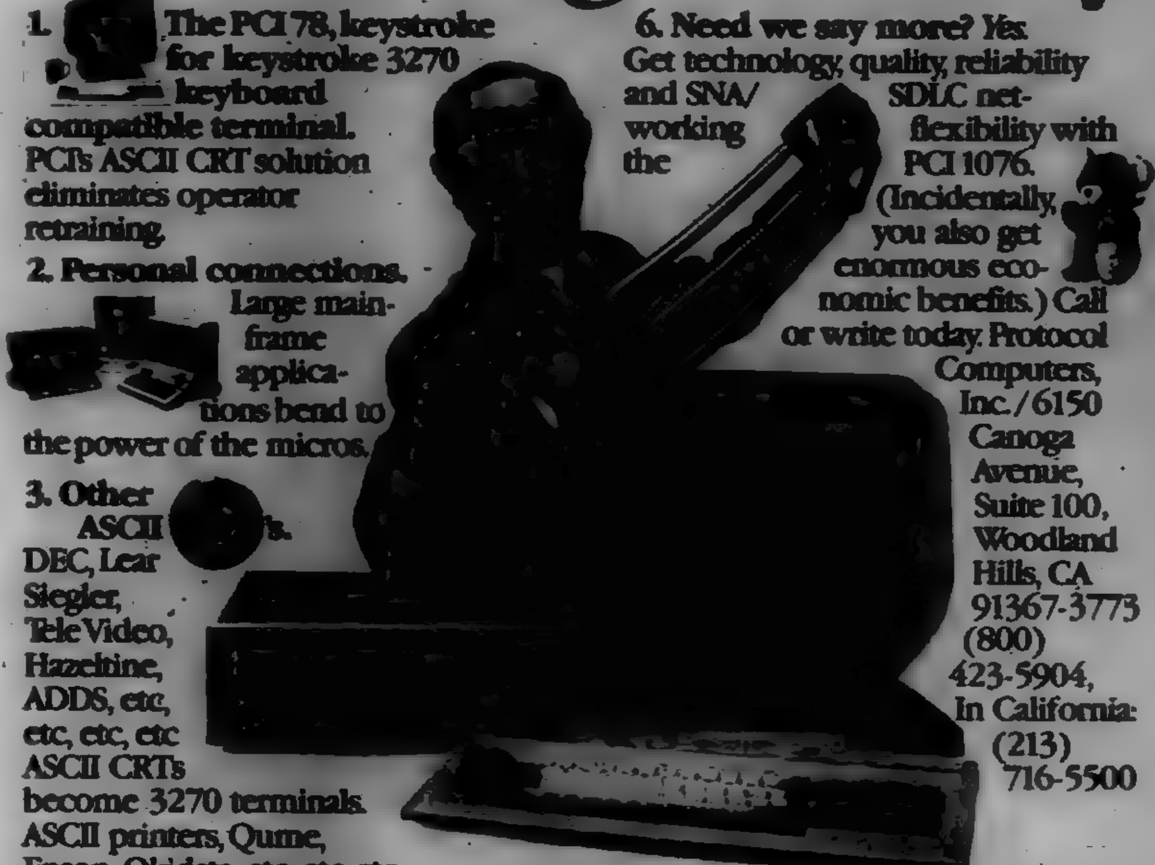

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Manufacturer Cleans Up With MRP System

CHICAGO — Selfix, Inc. is in a sticky business. The manufacturer of self-stick kitchen and bathroom items claims it owes most of its success to an automated materials planning package, which brought the firm from a batch-oriented environment to an on-line system.

Selfix makes about 450 items, ranging from soap dishes to toothbrush holders. Under the direction of Gene Schwarz, vice-president of manufacturing, Selfix has spent the past 10 years developing the materials requirements planning (MRP) system that controls the entire manufacturing process, except for production scheduling. Schwarz said the MRP system has allowed Selfix to handle a twentyfold increase in sales without having to increase manufacturing personnel.

Until April 1982, the MRP software ran in a batch mode on an IBM 370/125 mainframe. Schwarz said Selfix decided that in order to provide better control and speed up operations, the MRP — as well as other applications such as order entry, accounts receivable, accounts payable, sales statistics and payroll disbursement — had to be put on-line.

Schwarz explained Selfix wanted a system that could be expanded to accommodate expected company growth. The system also had to be portable — meaning Selfix wanted to use the Chicago system as the basis of a similar system at its sister manufacturing facility in England.

Schwarz said Selfix looked at the possibility of upgrading the 370/125, but decided the 3370 line did not meet its requirements. Instead, the firm decided to purchase a Wang Laboratories, Inc. VS 100 32-bit processor. The VS 100, which is configured for redundancy, features 512K bytes of main memory, two 300M-byte and two 80M-byte disk drives, two 600 line/min printers and 10 workstations, according to Ross Gosnell, management information systems manager.

Major Conversion Needed

"A major conversion was required, of course, but it was made relatively easy through a conversion package designed for converting Cobol and RPG programs on a mass basis," Gosnell recalled. "Our staff consists of only two programmer analysts who are dedicated to developing application programs for our user departments." Gosnell added that the firm was able to convert to the Wang system without having to hire a more expensive systems programmer.

At the same time it installed the VS 100 at its Chicago plant, Selfix also installed a Wang VS 80 processor in its UK manufacturing plant. That three-workstation system is equipped with two 80M-byte disk drives and is capable of executing all applications developed on the Chicago VS 100, Gosnell said.

Selfix has developed 750 programs and 225 procedures for integrated on-line applications such as order entry. The company purchased its accounts payable, accounts receivable, general ledger and asset depreciation packages from Minicomputer Busiess Applications, Inc.

The firm's MRP software is still operating in a batch mode on the Wang system; however, the MRP master files are on-line. The firm is currently developing a fully on-line MRP system that is scheduled to be functional by mid-'83, Gosnell said.

The on-line MRP system will include 2,000 bills of material containing 17,500 components and raw materials, 5,500 stock status masters representing finished goods, work in process, raw materials and a materials cost package, Gosnell said.

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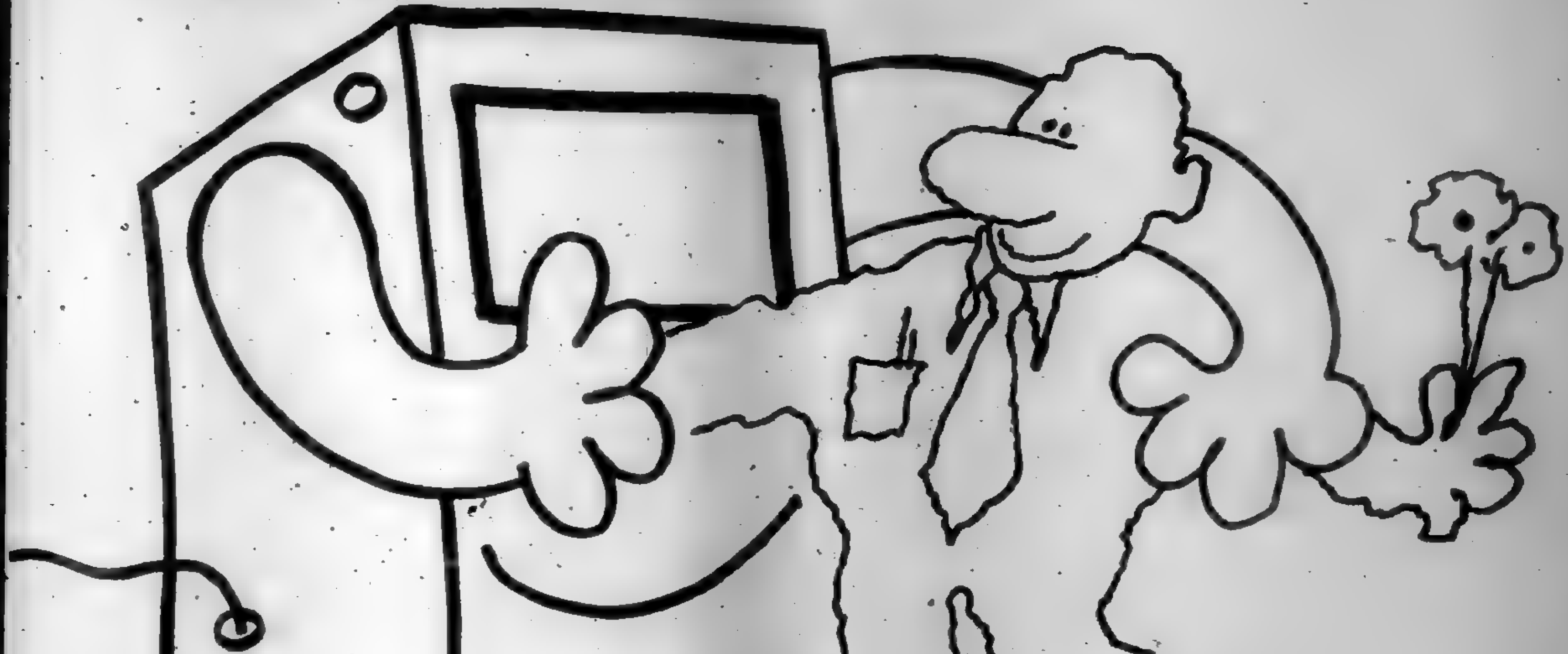

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Week of April 3

April 5-7, Chicago — **Computerized Office Equipment Expo.** Contact: Cahners Exposition Group, 1350 E. Touhy Ave., P.O. Box 5060, Des Plaines, Ill. 60018.

April 5-7, Chicago — **Structured Testing.** Contact: Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

April 6-8, San Francisco — **Structured Analysis and Design.** Contact: Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

April 7, Palo Alto, Calif. — **California Computer Show.** Contact: Norm DeNardi Enterprises, Suite 204, 289 S. San Antonio Road, Los Altos, Calif. 94022.

Week of April 10

April 11-13, Dallas — **Systems Network Architecture and Implementation.** Contact: Communications Solutions, 992 Saratoga-Sunnyvale Road, San Jose, Calif. 95129.

April 11-13, Washington, D.C. — **Effective Data Systems Development.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

April 11-13, Los Angeles — **Structured Very Large-Scale Integration Design.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

April 11-13, Washington, D.C. — **Capacity Planning.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

April 11-14, Philadelphia — **National Micrographics Association (NMA) Conference and Exposition.** Contact: NMA, 8719 Colesville Road, Silver Spring, Md. 20910.

April 11-14, Tokyo — **Intergraphics '83.** Contact: World Computer Graphics Association, Inc., Suite 399, 2033 M St. N.W., Washington, D.C. 20036.

April 11-15, Santa Clara, Calif. — **SMP Maintenance Workshop.** Contact: Amdahl Education Center, 1250 E. Arques Ave., M/S 302, Sunnyvale, Calif. 94086.

April 11-15, Columbus, Md. — **MVS Measurement and Tuning.** Contact: Amdahl Education Center, 1250 E. Arques Ave., M/S 302, Sunnyvale, Calif. 94086.

April 11-15, Atlanta — **Structured Systems Design/Structured Requirements Definition.** Contact: Gayle Giesecke, Ken Orr & Associates, Inc., 1725 Gage Blvd., Topeka, Kan. 66604.

April 11-15, Chicago — **CICS Macro-Level Programming.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016.

April 11-15, Boston — **CICS Command-Level Programming.** Contact: QED Information Sciences, Inc., QED Plaza, P.O. Box 181, Wellesley, Mass. 02181.

April 11-15, Seattle — **Auditing in the Contemporary Computer Environment.** Contact: Marge Umlor, Electronic Data Processing Auditors Foundation, 373 S. Schmale Road, Carol Stream, Ill. 60187.

April 11-15, Washington, D.C. — **CICS/VS Command-Level Programming.** Contact: Applied Technology Associates, Inc., Suite 1418, 1710 Goodridge Drive, McLean, Va. 22102.

April 11-15, New York — **Data Base Management System.** Contact: Workshop Coordinator, Software House, 1105 Massachusetts Ave., Cambridge, Mass. 02138.

April 11-15, New York — **Vsam File Management and Programming.** Contact: Rosa Roseto, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036.

April 11-15, Piscataway, N.J. — **CICS/VS Command-Level Applications Programming.** Contact: Rosa Roseto, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036.

Week of April 17

April 18-20, Tampa, Fla. — **Network Communications Protocols.** Contact: Center for Advanced Professional Education, Inc., 11928 N. Earlham, Orange, Calif. 92696.

April 18-21, St. Paul, Minn. — **Project Management.** Contact: Bill Schoonmaker, Brandon Systems Institute, 4720 Montgomery Lane, Bethesda, Md. 20814.

April 21-22, Washington, D.C. — **Software: A Legal Briefing for DP Professionals.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

Week of April 24

April 25-26, Cincinnati — **Software: A Legal Briefing for DP Professionals.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

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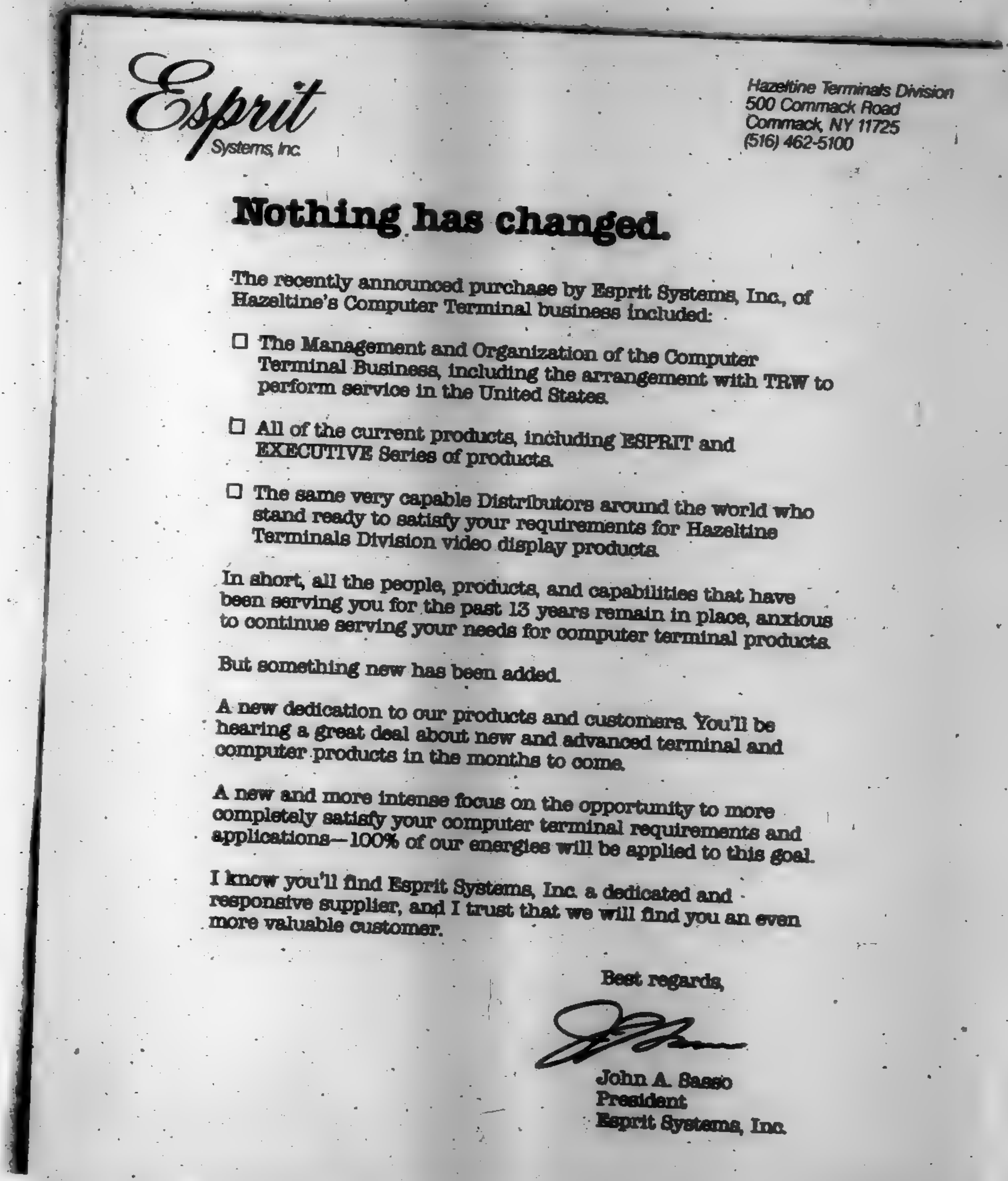

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I know you'll find Esprit Systems, Inc. a dedicated and responsive supplier, and I trust that we will find you an even more valuable customer.

Best regards,

John A. Sasso
President
Esprit Systems, Inc.

EDITORIAL

Bucking a Trend

Budget fever struck DP with a vengeance in two northeastern states recently. Ironically, however, the proposed budgets would have very different results.

In New Hampshire, newly elected Gov. John H. Sununu, an avowed fiscal conservative, proposed that the state dismantle its central DP facility this summer and distribute processing power to the individual state departments [CW, March 14]. The governor argues that DP is a bureaucratic liability whose functions could be handled more efficiently at the local level.

In New Jersey, meanwhile, Gov. Thomas Kean proposed a very different solution to what he called an "outdated and inefficient method of processing information." Kean wants to spend $20 million to modernize the state's decentralized computer system, to enhance communications between New Jersey's five major data centers and to establish a central Office of Office Automation [CW, March 14]. Kean's request states that New Jersey's current DP structure is expensive because departments are paying to maintain redundant data.

Which state has the inside line on DP efficiency? That question can only be answered by time.

The trend in DP today — obviously endorsed by New Jersey's Kean — is toward integration of computing systems. Communications compatibility is high on the DP manager's wish list, as is the desire to retain central authority in an environment that is feeling pressure to decentralize from microcomputer-smitten end users.

Sununu has elected to buck that trend. Why? One New Hampshire user said the move to fragment DP grew out of an independent study that found that users were critical of the power concentrated in the state's central DP department.

That should set off a warning bell in the mind of any DP manager who has wrestled with end-user resentment. While it is true that distributed computing offers autonomy, it also offers distributed headaches. Will end users find they can operate a DP facility more efficiently than a trained staff? Or will they find themselves calling those same professionals to solve their problems at the local level?

In New Hampshire, data processing has been made a showcase by a conservative governor who wants to wield a visible budget-chopping ax. But we question whether users there will find the alternatives to a central DP facility less expensive or less frustrating.

It will be interesting to check back a year from now to see if New Hampshire, in bucking a trend, has actually set one of its own.

DATA PAST

Five Years Ago
March 20, 1978

FLUSHING, N.Y. — A former student at Queens College admitted awarding himself unearned Phi Beta Kappa status in 1975 by tampering with the school's computerized grade records system.

Also examined was "hard, irrefutable evidence" that grades were changed for 12 to 15 other students by the same person.

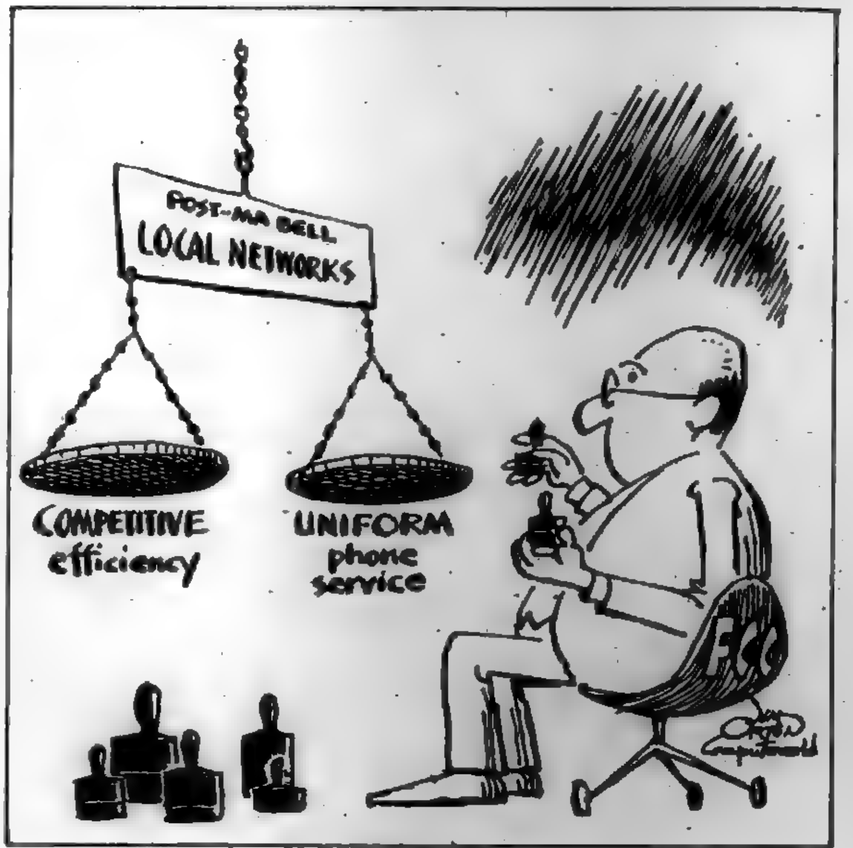
The grade changes, allegedly made between 1974 and 1977, were not discovered until January 1978, during a routine manual audit by faculty members.

Ten Years Ago
March 21, 1973

WHITE PLAINS, N.Y. — IBM unveiled the long-expected 370/115 as an entry-level machine — to the "virtual memory" 370 series — for use of IBM System/3s and smaller 360 models.

A new disk device — the 3340 direct access storage facility — and the 3203 printer were released concurrently with the 115.

The product announcements were in keeping with efforts to facilitate moving into the 370s with little or no reprogramming of existing applications, an IBM spokesman said.



Balancing Act

LETTERS

'No Mystery, No Magic'

The In Depth article "Data Is Money" [CW, Feb. 14], while excellent in many respects, unfortunately generates considerable semantic and conceptual confusion.

Central to this confusion is the article's failure to make clear that "money," that is, the money supply, is the sum of currency and demand deposit account (DDA) balances. The latter, comprising checking accounts, is referred to as "bank money." Commercial banks can create only bank money, not currency money. I think these distinctions will clear up the article's confusion about the bank's disk tracks being the focus of an account's "money."

A bank maintains some handy currency reserves in its vault, or till, and more with the Federal Reserve Bank. Call the combined proportion of DDA balances kept in reserves by each bank in the system r. Then $1-r$ of any given deposit to a DDA will be lent out and become another DDA deposit somewhere of which $1-r$ will be lent out and so on.

It can easily be shown that this geometric progression leads to the creation of $1/r$ more dollars of DDA deposits — that is, bank money — from the original dollar deposit which, in effect, is a dollar of currency money taken out of circulation and put in reserves.

For example, if commercial banks maintain 20% reserves at the Federal Reserve Bank and 2% in the till, $r=.22$, and the multiplier $1/.22=4.55$. Then, for each new $1 deposited in a DDA, the system of commercial banks will ultimately create $4.55 in new bank money. If no reserves are required ($r=0$), a theoretically infinite amount of bank money could be created, whereas if 100% reserves are required ($r=1$), no new bank money can be created. Clearly, bank money creation is simply a leveraging of currency money reserves.

The bank's disk field *amount* in customer DDA account records stores a customer's bank money balance, that is, the amount of currency money that the bank is obligated to give him if he insists. That currency money is located in the bank's till in the basement — not on disk tracks.

Inasmuch as the probability of all the bank's customers insisting on conversion of their bank money balances into currency money at the same time is very, very low, the bank maintains correspondingly low currency money reserves against the sum of all the bank money balances recorded on disk. But if anybody does want his "money" — currency money — he'll find it in the basement — not on disk! No mystery. No magic.

The illusion promoted by the article is an example of an old epistemological problem, namely, the problem of confusing representations of reality with reality itself. All that is ever "on" disk are physical states of matter electromagnetically oriented to represent characters invented and patterned by man to represent realities external to the disk. Representations of account credit balances must tie back somewhere to the reality of acceptable physical stores of value: currency.

To maintain worldwide validity of electromagnetic representations of millions of electronically implemented financial transactions is a monumental problem.

It will never be satisfactorily resolved, however, unless the underlying economics and epistemology are appreciated.

Stephen E. Seadler
President
Uniconsult
New York, N.Y.

LECHT ON SCIENCE/Charles P. Lecht

A Robot for Baby, a Hologram for Dad

In my opinion, the computer system (under which rubric I include communications subsystems) exceeds in importance anything yet invented by man. As a vehicle for the delivery of artificial intelligence, it has the power to alter our perception of reality — perhaps I should say the scope of our reality — by acting upon its wellspring: the human mind. Indeed, it seems to represent one of those rare quantum leaps in our evolutionary history that has forced the human mind to transcend its apparent limits simply to keep pace with the product of its own creative ruminations.

From the mere delivery of numbers otherwise impractical to obtain to the creation of holographic imagery indistinguishable from the underlying real stuff, the computer system improves upon our natural cognitive powers of logic, computation, association and memory in ways no less impressive than the ways in which our physical abilities were altered by engines.

In fact, there is no reason not to label modern computer systems "artificial intelligence engines." Their multiplicative and extensional effects upon our biologically based minds closely parallel those exercised upon our natural physical prowess and staying power by artificial strength delivery systems like the engine. And the engine's amplification of our ability to lift, move, pull, push and otherwise massage physical reality has immeasurably improved our chances for survival.

There was a time when people yearned to have engines all to themselves, after years of having been compelled either to share them with others or simply to make do without them altogether. Sooner or later, everyone who was anyone acquired (at least) one; many got some, some got many, and a few even wound up with quite a few. Engines evolved from trivial contraptions into magnificent multipliers of human strength as this process of dissemination continued to unfold.

Daily Operation

Nowadays, we have so many engines that we can scarcely avoid having to operate one each and every day, be we man, woman, child or laboratory rat. Access to engines has even trickled down to the paradisiacal crawl space of babydom. It is wholly unremarkable to find the modern moppet operating some simple species of engine, perhaps in the guise of a toy, before he has attained the statutory right to blow out his first, solitary birthday candle.

Setting aside the earliest, essentially experimental breed of engines, the distribution of the power introduced into our daily environments by engines started in earnest after the American Civil War. Evolving from crude motors barely capable of supporting the needs of a single person into nuclear turbines with the capacity to deliver enormous power to a multitude of other engines whose operation, in turn, they fueled, today's engines, and the technology from which they spring, provide us with the means to bring significant, almost intimidating, artificial strength to nearly everyone.

This marks the end of an evolutionary cycle wherein artificial strength progressed from virtual nonexistence to ubiquity, created in that part of man's consciousness that defines need and propelled inexorably forward by his dazzling ingenuity.

Driven by technological refinements and quantum improvements, and pulled along by the dynamics of market demand, this entire creative/distributive cycle prefigured what was to happen to computer systems technology as a vehicle for the propagation/diffusion of artificial intelligence (as opposed to strength) that has occurred from 1950 to the present day. Both have hewn closely to the path of Hegelian dialectics over the course of their maturation. Granted, the time frames are different and engine technology is further along in its development than computer technology, but the parallel is too compelling to be dismissed as mere coincidence.

Artificial Intelligence Technology

The entire, overall mix of artificial strength delivery systems, encompassing everything from microstrength to macroutilities, is being echoed and matched by products emerging from artificial intelligence systems technology. In both instances, improvements in cable- (including wire) and broadcast-triggered syntheses of once-discrete system entities are enabling the creation of networks of devices that can communicate their collective powers to everyone, everywhere. Amplifiers both of strength and of intellect have massive potential to augment our natural stuff, increasing our capacity to cope with life on spaceship Earth.

It is well worth noting, however, that the rate at which our physical strength is being amplified has slowed in comparison to the rate of expansion of our intellect. That the cost of Motorola, Inc.'s 68000 chip is such that one could hardly buy a decent screwdriver for the same money dramatizes this point. But in the interplay of things, each of these evolutionary processes will lead to qualitative benefits in the other. And nowhere could the truth of this thesis be more manifest than in devices that wed magnified strength to artificial intelligence: that is, in robots.

Robots are surely a part of our future. From self-watering, earth-searching, internal season-controlling flowerpots (embodying the paradox of the green thumb that functions without recourse or allusion to the human hand) to self-propelled, map-reading lawn mowers, robots will now enter our lives in a benignant invasion to free us from onerous chores and otherwise insulate us from the threat of physical or intellectual burnout. They can certainly be expected to help us redirect our energies from the struggle merely to stay alive to the problem of devising ways in which to make our lives more nearly worth living.

Of course, the skeptics, cynics and Luddites among us are likely to resist the inevitability of robots, preferring to dwell upon the "traditional" themes of dehumanization and enslavement that have characterized every robot-ridden cautionary tale tossed off in the salad days of the science-fiction literary genre. But, just as the heretofore separate develop-

(Continued on Page 48)

HUMAN CONNECTION/Jack Stone

Cyberphobia: Not a Routine Systems Problem

This is the second article in a series, "DPers and the Psycho-Computer Syndrome," coauthored with Joanne Barker.

One item missing from Harold and Elizabeth Guarnieri's article "The Psycho-Computer Syndrome" in *Computerworld Extra!*, for Nov. 17, 1982, is a large label with words printed in bold, black letters stamped on its front page that says: Warning!! Computer Industry Leaders Have Determined That Mishandling Cyberphobiac Users Is Injurious to An Organization's Health.

The caveat is necessary because the major theme of the article is that there is a "recognizable motivational pattern [Psycho-Computer Syndrome] with eight stages that always emerge during the training of a first-time user," mainly due to the fact that so many users, the authors allege, suffer from "cyberphobia" — fear of computers.

The authors suggest that during the course of computerization, information systems managers should look in user departments for symptoms of the syndrome, because then the information systems managers will be able to "guide [the] staff to accept and appreciate the system [they] know will generate departmental and companywide benefits."

Do you believe that the typical DP manager, without intensive training and experience in industrial psychology, is capable of recognizing some of the stages during training — "ego-status disintegration," "hostility/challenge," the "search for equilibrium" or "ego-status integration"? More to the point, even with the training, do you believe that most DP managers can function effectively as practicing psychologists? I believe the answer to both questions is a resounding "No!"

Oversimplified Approach

It appears to me that the authors oversimplified both the statement of the problem and the approach to its solution. This is unfortunate because the topic is certainly important.

One mistake in the article is the suggestion that cyberphobia is just another routine systems problem that can be described in a straightforward way and addressed with a comprehensive training program.

Comments such as "Your staff will let you know when they are ready to accept computerization as their new office routine" and "The first sign of their readiness is a request to establish new routines ... Respond to their first signal by giving them a scheduling pad" are so superficial that the reader can, I believe, be misled, perhaps dangerously so.

Wrong Impression

Another problem with the article is that one can get from it the wrong impression that there are an awful lot of nuts running loose in user departments, and many of these people are entering our terminal training programs.

Balderdash! Even granting that a number of systems have their problems, many more are successful systems that have reached required stability and performance. This would not have been possible without a high level of user cooperation and acceptance of the technology, with or without quality user training.

Of course, there are many users with valid and natural concerns, fears and apprehensions about automation, all of which are understandable. But to attribute incapacitating phobias to a large segment of the user population is, I think, grossly inaccurate and quite unfair.

Absurd Conclusion

The same kind of logic applied to the computer center leads to a similar conclusion. DPers are not generally known as talk-show personalities, but rather as people who focus a great deal more attention on computer interaction than on human interaction.

But it is absurd to dub the typical DPer an "anthropophobiac" — my neologism for one with a neurotic fear of people.

It is equally ridiculous to offer users eight diagnostics for checking the psychological states of DPers for the purpose of weaning them away from the machine microcosm into the user universe.

Letters to Stone should be addressed to him at Box 270, 1377 K St. N.W., Washington, D.C. 20005.

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READER COMMENTARY /James J. Marcellino and John M. Conley‡

Negotiate Contract Clauses at the Beginning

Trial lawyers are often heard saying that there are two things you cannot change in a case — the judge or the facts. That is basically true. Although on occasion you can change the judge, the judge usually is assigned to the case either at random or as a result of sitting in a particular court. When it comes to the facts, all the trial lawyer can do is present what happened in the best possible light for his client, using every available means within the law and the professional code of ethics.

In the vast majority of computer-related cases, the contract itself is the significant "fact" because the contract determines the standard by which the parties' performance will be measured and in large part, determines the consequences of any breach.

Unfortunately, parties to computer-related contracts frequently fail to consider contract provisions that may be important if the contractual relationship runs into trouble. When the contractual relationship founders, a trial lawyer must step in to counsel his client on how to proceed. However, at that point, the die may be cast and the options limited. What a trial lawyer prefers is that the parties to a contract negotiate at the time of the formation of the contract about what will happen if a default or breach occurs.

Sometimes Reluctant

The parties are sometimes reluctant to negotiate contract terms relating to what happens if all goes wrong. Although negotiations on those terms might prove difficult or embarrassing, breach or default provisions, or their absence, may have a significant impact on the outcome of the dispute or litigation. The parties might do well to remember that people successfully negotiate antenuptial agreements.

Specifically, what would a trial lawyer want parties to a computer-related contract to negotiate? While each contract provision should be carefully tailored to the circumstances of the parties' relationship, the following are widely used clauses:

- Integration clause. Integration clauses simply provide that the agreement is what it purports to be, namely, the entire agreement between or among the parties.

By reducing their promises and understandings to writing, the parties bring into play certain important rules of law. Particularly, they bring into play the principle that the interpretation of the contract should be confined to the written agreement because the writing was intended by the parties to represent the agreement. Providing there is no ambiguity, the contract then becomes the best and only evidence of the agreement between the parties. The integration clause also will have the effect of barring the introduction of oral evidence of representations and statements not contained in the writing.

- Safe harbor provision. Cases arise where one of the parties will argue in defense that a contract is unconscionable in light of all the material facts surrounding its execution and, thus, unenforceable. To rebut that argument, the contract might provide that, for example, the customer acknowledges that he has read the agreement in question, understands it, has had the opportunity to seek advice of counsel and agrees to be bound by its terms and conditions.

- Variation by contract of time for bringing action. As a general rule, a provision dealing with the time within which a party can bring legal action on the contract is valid and binding so long as the contract provision is not unreasonably short and there is no statutory law to the contrary. The courts have recognized that the plaintiff should be given sufficient opportunity to investigate the claim and prepare for the controversy. Accordingly, the permissible time period will vary depending on the circumstances and subject matter of the contract.

- Governing law and forum. Subject to certain limitations, the parties to a contract have the power to designate the law to be applied. Generally, where the parties have expressed a specific intent with respect to the governing law, courts will uphold the parties' choice as long as the contract is not contrary to public policy of the designated state and as long as that state has some substantial relation to the circumstances of the contract and its performance. It is less clear whether a contract stipulation by which the parties consent to the jurisdiction of a particular court is enforceable. However, the parties to a contract should consider what their preferences are and whether such a provision would be enforceable under the circumstances.

- Appointment of agent for ser-

(Continued on Page 48)

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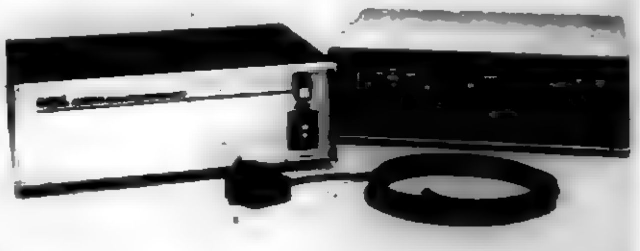

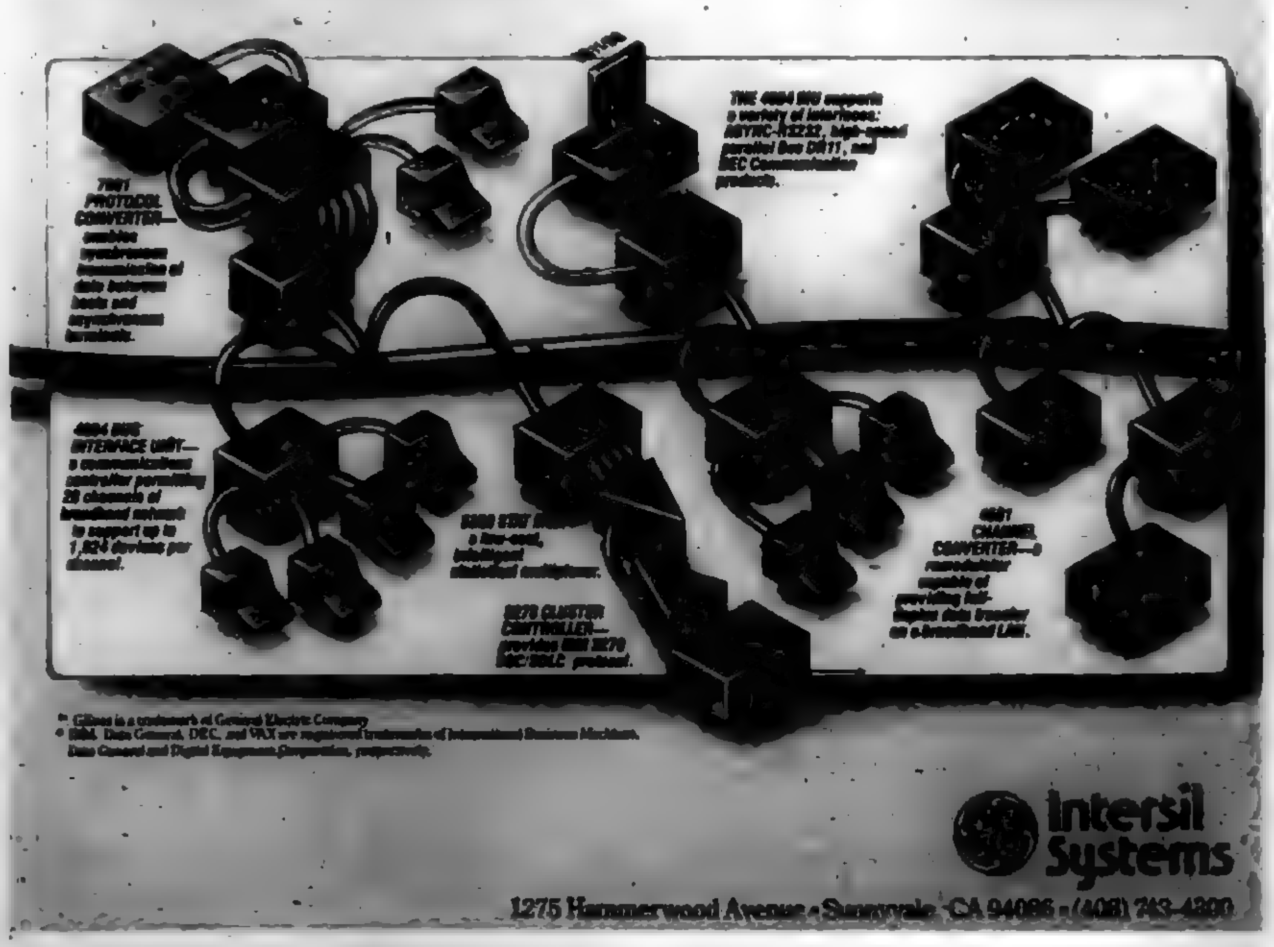

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READER COMMENTARY/Leslie Srager‡

Prepare Before You Negotiate a DP Contract

In negotiating contracts, the first question one considers is "Why negotiate?" We have all heard or uttered the usual cliches — "It's such a simple matter; why do we need a full contract?" and "I negotiated a contract once and all it did was stay in my desk drawer. We never looked at it." All of those are good excuses, but bad reasons.

While it is true that by and large, your best recourse is a company or individual with principles and a good reputation and most contracts do simply remain in file drawers, you need a contract for those occasions when something goes wrong. For example, many people thought OPM Leasing Services, Inc. or Itel Corp. were solid companies, and look what happened to them.

What happens when the salesman you treasure or the vice-president you dealt with leaves, dies or retires? There is simply no substitute for a contract that clearly and specifically sets out the responsibilities, requirements, obligations and recourses of each party.

This is particularly true in the computer area, where much of the work done is in new, imaginative circumstances using complex equipment and little-understood, rapidly changing technology.

The process of negotiating is very interesting; when well thought-out, it is a microcosm of business itself. There are several day seminars and many books written solely on the art of negotiating. This article covers only the tip of the iceberg.

Preparation Is Key

I believe the most important element in negotiating any contract is preparation. The second most important element in negotiating a contract is preparation and the third most important element is preparation.

He who prevails in negotiation is the one who knows the facts best, has his ultimate goal well in mind and has thought through to the best of his ability the issues and possible compromises so that he may achieve his ultimate goal. In significant contracts, this involves a major amount of time, but it is well worth it.

No one person can do it all. There should be a leader of the negotiating team, but that leader must complement his weaknesses by properly choosing the team and by listening to the team.

An Example

For example, we had a major negotiation with Pacific Telephone & Telegraph Co. (PT&T). It was for a contract that was to extend over a minimum of three years, during which our company was to acquire a large computer for the use of PT&T, place it in our facility in Sunnyvale, Calif., run it under our operating system, place on it our software, have our people operate it and set up a private network to connect it to other offices of PT&T throughout California — obviously, a major undertaking.

The contract ran over 100 pages, took several months to negotiate and was basically still in effect seven years later. The team we had consisted of our top technical man, the salesman on the PT&T account and me. That was a small team, but it was effective.

Each member of the team knew his role and each made contributions in areas in which the others were deficient. The salesman contributed history, identified particular PT&T needs, gave us background on the PT&T negotiators and played a large role in establishing a good rapport between the two teams. The technical man told us what we could and could not do technically and was in a position to establish what were for us reasonable tests with respect to installation, uptime, crashes, response time and the like. I evaluated the legal problems, did a lot of drafting and helped to evaluate the business problems. We had one principal spokesman. That was a good, well-rounded team.

While I've used a large contract as an illustration, the needs I noted apply to small contracts as well. Obviously, the hours spent in preparation should be substantially reduced and you do not need a full team.

In negotiations, the vendor has considerable advantages over the user. He knows his costs — the user does not. He knows precisely his limitations — the user does not. And most important, the vendor knows his weaknesses — the user does not.

User's Advantage

The user's big advantage is it is doing the paying, and all vendors have one thing in common — they want the sale. Users must keep in check those departments that simply must have a product or service. The user has to be sure it will get the needed product or service at a fair price and

(Continued on Page 46)

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Prepare Before You Negotiate a DP Contract

(Continued from Page 45)

when and where it is wanted.

In my opinion, a key element in negotiations is to have an experienced, single-minded group doing the negotiating. Negotiating is a discipline just like law, accounting or writing a computer program: It requires experience, knowledge, endurance and preparation. If possible, the group should not include the people who have the crushing need for the product or service. A vendor looks for openings that it can exploit, and the best opening is finding the buyer's "hot button" and pushing it.

On the vendor's side, it is difficult if the salesman whose commission is at stake does the negotiating. The salesman can play a very useful and important role, but I do not think he should be one of the principal negotiators.

User Point of View

Let's take a plain-vanilla timesharing contract from the user point of view. The vendor has a fancy printed contract that, it explains, thousands of others have signed. But why should you? Why should the vendor have a dollar limit on its liability? Why should the vendor be allowed to cut you off the system with no warning if for some reason you happen to be late in your payment? There are many other issues that could be of great significance to you.

Do not take anything for granted. For example, vendors say "Oh don't worry. We never cut customers off unless they are delinquent for 90 days." That's a perfect opening for you to say "Well, if you always do it, then why not put it in the agreement?" A typical user ploy is to hint at other companies willing to provide the service or product on better terms.

But a negotiation is not a war. You must live together later. State your positions, but always try to be (or at least appear to be) reasonable. State reasons for your positions, but do not be hostile. Use a phrase like "this is a breakpoint" sparingly. If you use it often, it loses its effect. Try to establish a rapport.

Be on guard against "salami" negotiating, that is, slicing an issue at a time because each isolated issue does not seem too important. Try to get the other side to state its problems and collect all of them, except perhaps the most fundamental. Then you know the universe with which you are dealing and you can see the horse trading you can do. You can also see how bad the problems are and whether they are raising issues you had not anticipated and for which you have no backup positions.

When you want to install a new system and the software you were promised by your friendly vendor does not appear and your boss asks you how you are going to recover some of the lost costs or profits, you are going to want to look at the contract and it is going to have to set out the obligations and liabilities of the vendor. If you don't have this, you're just swinging out there all alone.

Srager is a partner in the law firm of Rogers & Wells, Greenwich, Conn.

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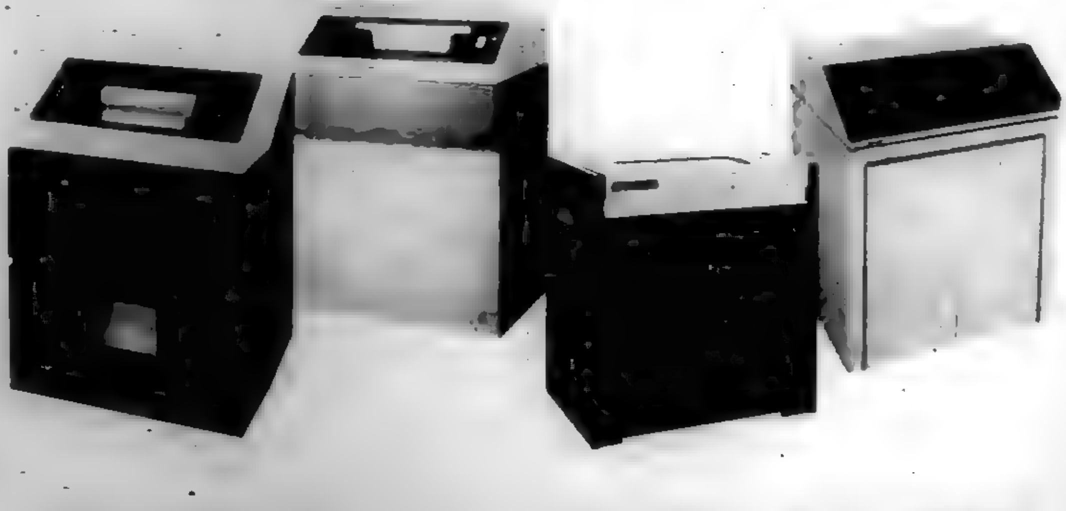

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LETTERS

'Work Made for Hire'

Roland K. Bowns' reader commentary "Who Owns Software Written Under Contract?" [CW, Feb. 7] suggests that having a commissioned author sign a provision that the software is a "work made for hire" will vest title in that software in the employer.

My understanding of the copyright law is that under Section 101, a "work made for hire" is either a work prepared by an employee within the scope of his employment or a work specially ordered or commissioned for use as a contribution to a collective work, as a part of a motion picture or other audio/visual work, as a translation, as a supplementary work, as a compilation, as an instructional text, as a test, as answer material for a test or as an atlas, if the parties expressly agree in a written instrument signed by them that the work shall be considered a "work made for hire."

In the situation in which an employer requests commissioned software for general application not falling within one of the above categories specified in the statute, it is doubtful that a mere agreement will convert the software into a "work made for hire."

The Senate Committee Report states: "The basic problem is how to draw a statutory line between those works written on special order or commission that should be considered as 'works made for hire' and those that should not. The definition now provided by the bill represents a compromise which, in effect, spells out those specific categories of commissioned works that can be considered 'works made for hire' under certain circumstances." This seems to imply that the software cannot be considered "works made for hire" if it does not fall within one of the specific categories.

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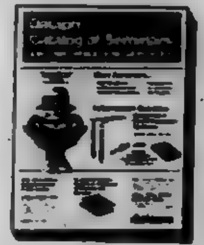

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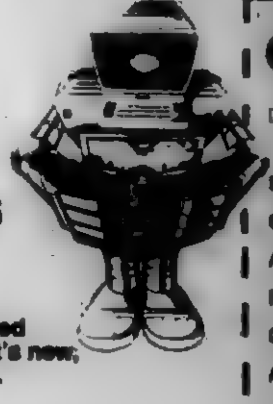

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A Robot for Every Baby, A Hologram for Every Dad

(Continued from Page 41)

ment of engines and computer systems technologies has palpably contributed to the general welfare, the ultimate synthesis of these two great currents in the form of human-subordinated robots can only do the same, perhaps more than twice as well!

Better Off

When each and every one of us has at least one robot, we'll all be a lot better off (if for no other reason than that our magnificent Samson-cum-Einstein contraptions will keep our cool for us when our natural circuitry has succumbed to sensory overload)!

And when there are finally enough of them to go around and robot-sharing has become a part of the dusty past, they will find their way, even as engines did and computers are now doing, into the hands of our children. And there resides, as it always has, the collective aspiration of our race.

It should not be too long now before each baby has at least one robot within a year of birth and everyone older, more than one. When this happens, it will end an Hegelian phase of the evolutionary cycle in robotics; future robotics will manifest increases in quality and number rather than in basic innovation.

With engines, computers and robots as integral to our perceived "natural" milieu as water and air, each of us shall have been translated into a human component in a flexible, nonthreatening network of organic and inorganic material expression.

I suppose there will always be someone to argue that we would be better off, and somehow more properly human, without this interdependency. It could, in my view, be as sensibly asserted that we would be better off enduring the surgeon's knife without anesthesia.

Suppose we had all this technology, and things were really improving for us: What would be the next technological breakthrough to rank in positive impact upon our lives with the computer? I believe the answer to that question is holography.

The key to holography's importance to humanity and its quest for peace, and that which elevates it beyond the plane described by "mere" computer applications, is in its potential for erasing invidious distinctions between the actual and the apparent.

If this seems frightening at first, consider its ramifications for such dangerous and crippling illusions as unbridled materialism. Does not holography contain within it the (superficially) surprising promise of offering mankind a boost, via technology, out of the physical, and from there into — where else — the spiritual? I think so.

Lecht is president of Lecht Sciences, Inc., a New-York-based think tank specializing in computer and communications technologies.

Negotiating a DP Contract

(Continued from Page 44)

vice of process. To enhance the prospects that a party may be sued in the chosen jurisdiction, the contract might provide that a corporation or individual within the chosen jurisdiction act as its agent for service of process.

As an alternative, the parties might designate a public official as the agent for the service of process either as the primary agent or if the original named agent resigns, dies or otherwise is unable to receive service.

- Waiver of jury trial. A contractual waiver of a jury trial, made independently of any pending litigation, may be enforceable. In many jurisdictions, a party can delay the trial of a case by claiming a jury trial because the courts are backlogged with criminal and civil cases requiring a jury trial.

It is generally quicker to proceed to a trial before a judge without a jury. In addition, in computer-related litigation, the judge may have a better understanding of the technical issues.

Moreover, when a case is tried without a jury, there is a written opinion in which the judge sets out his factual and legal conclusions.

- Rights and remedies of parties in the event of breach. Generally, a contract will not be construed to limit the remedies available to the parties unless an intention to do so is clearly expressed on the face of the contract. The parties may seek to spell out their remedial rights in several ways.

They may provide, for example, for liquidated damages, that is, a specified amount or a formula for calculating such an amount in the event of a breach. A liquidated damages provision will generally foreclose all other forms of damages.

Alternatively, the parties may agree that the nature of the contract is such that monetary damages would be inadequate. For example, in drafting an employment contract for a uniquely skilled employee, the parties may acknowledge that monetary damages would be inadequate in the event that the employee went to work for a competitor or the employer.

In such a situation, the parties may stipulate, first, that monetary damages are inadequate and, second, that the injured party is, therefore, presumptively entitled to have a court issue an injunction against the breach. Such provisions will generally be enforced by the courts as long as the provisions are reasonable in light of the circumstances of the parties.

- Severability provisions. Obviously, if for unforeseen reasons, a provision of the contract is declared invalid and the parties want the remaining portions to remain in full force and effect, they should say so.

Marcellino and Conley are attorneys with Gaston Snow & Ely Bartlett in Boston.

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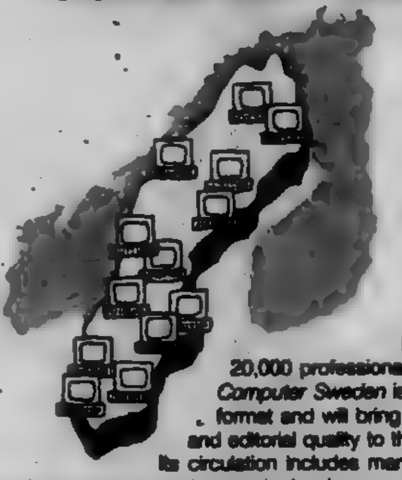

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Assists in Options Forecasting

Modeling Aid Helps Oil Firm's Planning

LAFAYETTE, La. — The ability to better forecast the effects of various management options in both day-to-day operations and long-range strategic planning was the goal of an oil and gas company headquartered here.

Since Celeron Corp. already had in place an IBM 4341 that was used for a number of corporate functions, the firm's management began searching for a software package that would fulfill its corporate planning criteria. These included relatively unrestricted data manipulation capabilities, use of a language that would not require massive programming efforts when the model was changed and ease of use for non-DP personnel.

After surveying the field, Celeron chose a product of Economic Sciences Corp. in Berkeley, Calif., called EMS, according to Ed LeBlanc of the firm's corporate planning department. The installation was handled jointly by the DP staff of Celeron and vendor personnel. Actual development work in EMS was done by two Celeron modelers who support all use of EMS in Celeron and subsidiaries, he explained. In addition, the vendor's consulting staff helped implement the initial general structuring of the system.

Celeron is the parent of five operating companies engaged in almost every segment of the oil and gas industry, including natural gas transmission, oil and gas exploration and production, natural gas processing, oil refining, natural gas distribution and petrochemicals. Each operating company serves as an independent profit center with its own areas of operations. As the parent, Celeron provides a number of general management services to each operating company, especially financing.

LeBlanc said that Celeron and its operating companies face a widening range of issues which need to be addressed by a planning system. Some of the examples suggested were: the effect on the company of alternative government economic poli-

(Continued on Page 52)

Report Writer Targets Analysts

BERKELEY, Calif. — Economic Sciences Corp. has released a report writer aimed at business analysts who need simple yet flexible financial reporting.

The facility is available within the firm's EMS corporate modeling and data base management system (DBMS). Income statement, balance sheet, cash flow, variance and ratio are said to be simplified by the report writer.

The EMS modeling and DBMS system is currently available for installation under IBM's VM/CMS operating system and may be licensed on a short-term or permanent basis. Permanent licenses range in price from $95,000 to $150,000. The vendor is located at 2150 Shattuck Ave., Berkeley, Calif. 94704.

'Tasc' Generates User-Selected Code

WOODRIDGE, Ill. — GEN 4 Systems has announced an on-line screen code generator for IBM and plug-compatible mainframes running under DOS or OS with CICS or Information Management System.

Called The Automatic Screen Coder (Tasc), the product is said to generate code with attributes, data names and other features that a user selects. Data names can be up to 25 characters in length. The package also generates the Cobol copy book that is used in a program's terminal I/O area.

Tasc allows the programmer to paint the entire desired screen directly on a terminal and generate either basic mapping support or message format service code from that image, a spokesman said.

The purchase price is $795 or $150/year on a lease basis from Suite 38A-1700, 8280 Janes Ave., Woodridge, Ill. 60517.

VM Systems Get Backup Facility

ENGLEWOOD CLIFFS, N.J. — Syncsort, Inc. has announced Syback, a backup, restore and copying facility for IBM VM systems.

At the same time, the company announced Release 1.6 of Syncsort, a sort/merge program for IBM DOS/VS(E) environments.

The company claimed Syback reduces elapsed time, CPU time and start I/O resources required for backup/recovery. The package can perform system backup operations automatically.

Syback can execute in a stand-alone mode as well as under VM/CP and VM/CMS. It can also be invoked as a utility under CMS or from CMS executive procedures or user programs. A three-year license costs $9,000.

The new release of Syncsort incorporates a Sortwriter feature and multiple output capabilities. With a single pass of the sort, Syncsort DOS can sort and manipulate data and present the output from the sort in user-specified form.

Sortwriting capabilities include headers, trailers, totaling and subtotaling at report, page and section levels. Pagination and dating, spacing and line skipping, character insertion and data format conversion are available, the spokesman said.

A three-year license costs $4,650.

Syncsort is located at 560 Sylvan Ave., Englewood Cliffs, N.J. 07632.

CPS Enhances 'Doktor' Generator

WAYZATA, Minn. — Commercial Programming Services, Inc. has released an enhanced version of its Doktor Cobol program documentation generator.

Doktor provides seven reports and charts of Cobol programs, a spokesman said. They include an I/O chart, a detailed flowchart and a data cross-reference analyzer.

The package costs $7,200 for OS installations and $6,500 for DOS and most other mainframes, the spokesman said.

Commercial Programming is located at 3701 Shoreline Drive, Wayzata, Minn. 55391.

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MPG Announces Pricing Structure for Ramis II

PRINCETON, N.J. — Mathematica Products Group, Inc. (MPG) has announced a four-tiered pricing structure for its Ramis II fourth-generation language and data base management system (DBMS) and 15 optional components.

The new pricing is based on potential value, which MPG equates with CPU power using performance ratings developed by International Data Corp.

Costs for the basic Ramis II system range from $40,000 for use on an IBM 4331 to $80,000 for use on an IBM 3081. Sixty-month payment plans ranging from $960/mo to $1,920/mo are available.

The pricing also applies to the 15 optional components that tailor Ramis II to specific capabilities. Typically configured systems geared toward decision support applications range from $62,000 on a 4331 to $124,000 on a 3081.

For a DBMS configuration, prices range from $73,000 on the 4331 to $146,000 on a 3081. A fully configured Ramis II system ranges from $86,000 to $172,000.

Individual options include the Formatted Screen Manager, ranging from $6,000 to $12,000; the Plot high-resolution graphics facility, $5,000 to $10,000; and Relate, which provides relational access to data in the form that already exists, $7,000 to $14,000, according to a vendor spokesman.

MPG can be reached through P.O. Box 2392, Princeton, N.J. 08540.

Review Service Announced

LOS ANGELES — The accounting firm of Coopers & Lybrand has announced an independent evaluation service for commercial software based on a method developed for internal use at the firm.

The process involves reviewing design and documentation, testing the functioning of the accounting and auditing procedures and controls and evaluating and reporting the results. The service also determines if financial packages are prepared in accordance with generally accepted accounting principles, a vendor spokesman said.

The resulting report identifies the package, directs potential users to the internal controls included in the package, describes what is and is not covered in the review and specifically identifies test limitations, a spokesman said. Pricing is based on a variety of factors, including the complexity of the package and the time required for analysis.

The service is administered from 1000 W. Sixth St., Los Angeles, Calif. 90017.

Cdos Provides Trading Info

NEW YORK — The Monchik-Weber Corp. has announced a real-time trading support service, the Commodities and Debt Options Service (Cdos).

Cdos reportedly consists of a series of on-line display screens that provide quote information, theoretical values and strategy analyses on nonequities options, such as those on futures contracts, financials and indexes. Currently, Cdos provides calculations on gold, sugar and T-bonds; pricing information on the new options, specifically the Standard & Poor and New York Stock Exchange Indexes; and data on the Value Line Index, according to a spokesman for the vendor.

The screen displays give calculations for all calendar months and include last price, net change, high/low, bid/ask, actual and estimating volume and open interest. Also included are spreading, hedging and arbitrage strategies, the vendor spokesman said.

Cdos is available on a time-sharing basis and can be accessed nationwide via the Tymnet, Inc. network. Monchik-Weber is located at 11 Broadway, New York, N.Y. 10004.

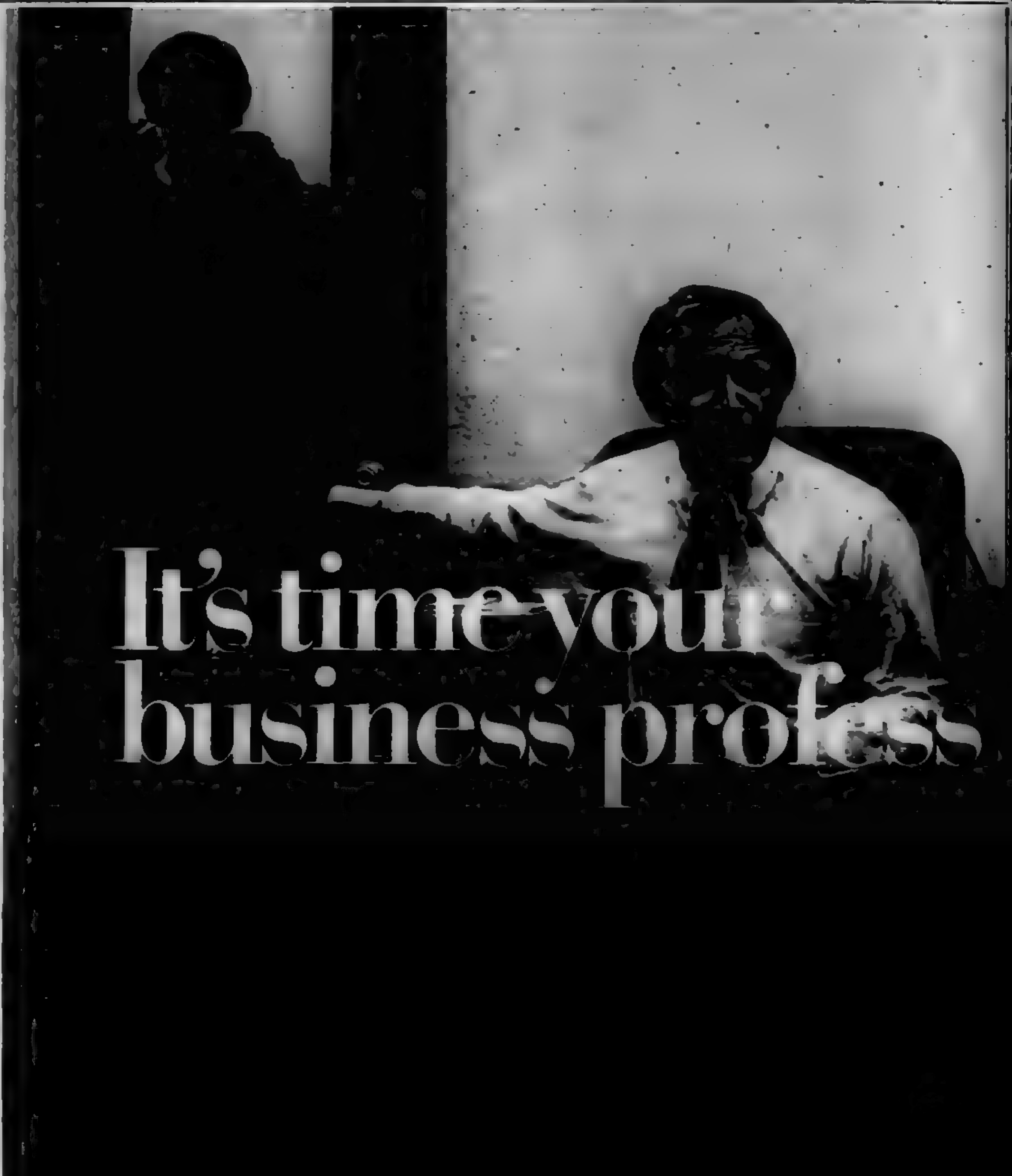
Support Added to Vserv for DOS

SANTA CLARA, Calif. — Software Assistance, Inc. has added support for fixed block architecture disks to its Vserv Volume Table of Contents (Vtoc) service utility for IBM DOS and DOS/VS(E) operating systems.

Vserv provides a disk mapping facility for identifying wasted or poorly used disk space and has Vtoc manipulation capabilities to enable the user to take direct action in solving allocation problems and altering file attributes, a spokesman said. The package requires no assignments prior to execution and can operate on multiple drives in a single execution.

The facility also shows all data areas and free spaces in extent order followed by summaries and statistics for free space, alternate tracks and data set usage. It recognizes system files and libraries and displays end-of-file addresses, blocking efficiency and track usage.

The purchase price is $600 from Software Assistance through P.O. Box 2101, Santa Clara, Calif. 95055.



Provides Summary Records

Release 2.8 of Fastdasd Unveiled

HERNDON, Va. — Software Corp. of America has announced Release 2.8 of Fastdasd, a direct-access storage device (Dasd) performance and reporting system with a history file that maintains a perpetual record of Dasd use and performance and provides documented summary records.

Customized reports and graphs can be produced using programs such as SAS Institute's SAS and Pansophic Systems, Inc.'s Easytrieve, the vendor noted.

A spokeswoman said new reporting features have been added to the data analyzer. They include interactive seek and generic data set name selection capabilities and a cross-volume reorganization report that recommends moving data sets to other volumes. New control cards and keywords have been added and a reference card is available which lists Fastdasd key words and provides tables on Dasd timing and capacity.

Fastdasd operates on IBM mainframes running OS and supports IBM Dasd and compatible devices. The product costs $5,500 for one CPU and $13,500 for a site license from 455 Carlisle Drive, Herndon, Va. 22070.

'Property Pro Series' Fits IBM

ATLANTA — Property management software designed for nonresidential real estate facilities and said to run on IBM's Datamaster has been introduced by the Management Control Systems Division of Informatics General Corp.

Property Pro Series reportedly provides property managers with accounting tools for financial reporting, tenant management, accounts payable and investment modeling.

The software is priced at $10,500 from the Management Control Systems Division through P.O. Box 723787, Atlanta, Ga. 30339.

HP 3000 Gets Modeling System

PHILADELPHIA — Data-Tek Corp. has announced Proforma, a financial and business modeling system for users of the Hewlett-Packard Co. HP 3000 computer system.

Proforma includes "what if" and spreadsheet applications in areas like budgeting, venture risk analysis, fund management and scheduling.

A spokesman said Proforma uses English-language commands. It costs $20,000 and is available on timesharing from Decisions Development, Inc. of New York, N.Y.

Data-Tek is located at Suite 400, 1211 Chestnut St., Philadelphia, Pa. 19107.

Global Offers OS JCL Release

DUXBURY, Mass. — Global Software, Inc. has announced Release 2.0 of its OS JCL Convertor for IBM mainframes running under OS.

Release 2.0 reportedly provides orderly automated population of a data dictionary with the information contained in a firm's OS JCL. Currently, the JCL Convertor supports Data Dictionaries managed by MSP, Inc.'s Datamanager.

The new release is said to add reports and programs to the list of objects that can be extracted from the JCL and symbolic parameters can be extracted and used as attributes of an OS procedure or job step. Also, the new release allows the convertor to process relationships, attributes and comments associated with nine different kinds of data processing assets. The appropriate information is formatted into source language suitable for maintenance of a Datamanager data dictionary.

Facilities are provided to enable ongoing maintenance of the data in the data dictionary as the JCL itself undergoes normal growth and change, the vendor said.

Perpetual licenses are $4,500 through May 31 and $5,500 thereafter and are available from Global Software, which can be reached through P.O. Box 2087, Duxbury, Mass. 02332.

'DOC-USS/34' Fits System/34

KING OF PRUSSIA, Pa. — An online documentation aid for IBM System/34 users said to provide a capsule view of the status of all files, programs and libraries, is available from Universal Systems Services, Inc.

DOC-USS/34 identifies indexed, sequential and direct files; indicates record length, number of records allocated/used/available; and for indexed files, indicates the key position and length.

In addition, all programs that use a file are listed beside the file, alerting the user to necessary program adjustment as the result of file changes, the vendor said.

The software costs $340 from the firm at Suite 215, 1150 First Ave., King of Prussia, Pa. 19406.

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Assists Forecasting Ability

Modeling Aid Benefits Oil Firm

(Continued from Page 49)

cies and the resulting interest rates, inflation and taxes, alternative proposals for natural gas decontrol and changes in Organization of Petroleum Exporting Countries crude oil pricing strategies. In addition, the system is needed to evaluate the effects of specific factors, such as changes in natural gas purchases by individual pipeline customers.

To meet its planning system requirements, the modeling takes place on two general levels. First, a monthly short-term budget model is used to examine the firm's and operating companies' well-being over the coming year. This is to support tactical decision making on a day-to-day basis. Secondly, an annual long-range planning model will be used to examine policy questions regarding where to take the firm in the future.

To construct the modeling system, Celeron is using the mathematical capabilities of EMS to simulate the economic and engineering relationships within each functional activity of each operating company and to factor in the data that determines revenues and costs within that function, LeBlanc explained. The functional models for each operating company are connected to a financial model for that company, and the outputs of the functional models become inputs into the company financial model. Each company's financial model produces income and cash flow statements and balance sheets which are, in turn, input into a corporate consolidation. model that produces consolidated financial statements for Celeron under alternative economic, financial, regulatory and operational assumptions.

The operational model of the natural gas processing plants considers the ability of a plan to produce the possible volume and mixes of gas liquid products given such factors as the properties and volumes of the source gas, the engineering of the plant and the prices of products produced, LeBlanc explained. This model then determines — from these variables — the most profitable product volume and mix and the resulting income/expense associated with that operating level.

EMS also can be used to consider the impact on Celeron of acquiring a new firm into its corporate structure, he continued.

Using the EMS software, Celeron has developed the general structure of its strategic planning system. The modeling of all subsidiary companies is underway, incorporating as many of the functional analysis modules as possible and marking the place for those to be incorporated later. "Some people think we're done," LeBlanc said, adding that the current accomplishments have indicated future possibilities for the firm.

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—Bob Regan
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The ARC local area network can be expanded virtually without limit by simply plugging in additional Datapoint processors, printers, storage disks, and terminals. Each new processor adds power to the network so new users get the same fast response the original users were getting. Companies can closely match the power of an ARC system to their needs, expanding in small, inexpensive increments instead of buying "more computer than they need" in order to have room for growth.

What's more, Datapoint systems can be expanded or upgraded without replacing software. "We run some programs on ARC networks that were originally written for our first Datapoint computer more than ten years ago," says Regan. "That means we didn't lose any of the money we invested in programming and training. And it made the growth steps easy on our people. The changeover to the ARC network was accomplished in only two days."

No matter how far an ARC system is expanded, all the users can have access to all the data except where security precautions are installed. So even though more and more people are using more and more computers, there's never a need to duplicate files.

"At present, Hyatt operates forty-five ARC systems," Regan says. "Others are in the planning stages right now. On the operations side we use them for accounting, reservations, and group sales. At Corporate we use them for accounting and for systems development. Obviously, we depend on them heavily. They're like the meters where we check our own financial performance. They simply have to work. And they do.

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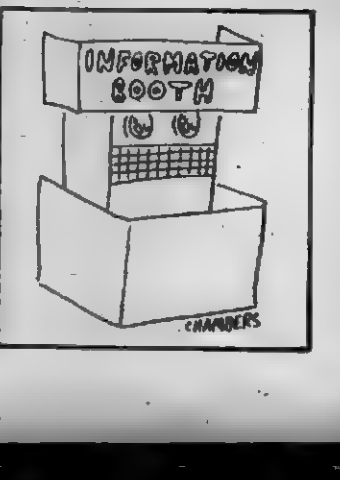

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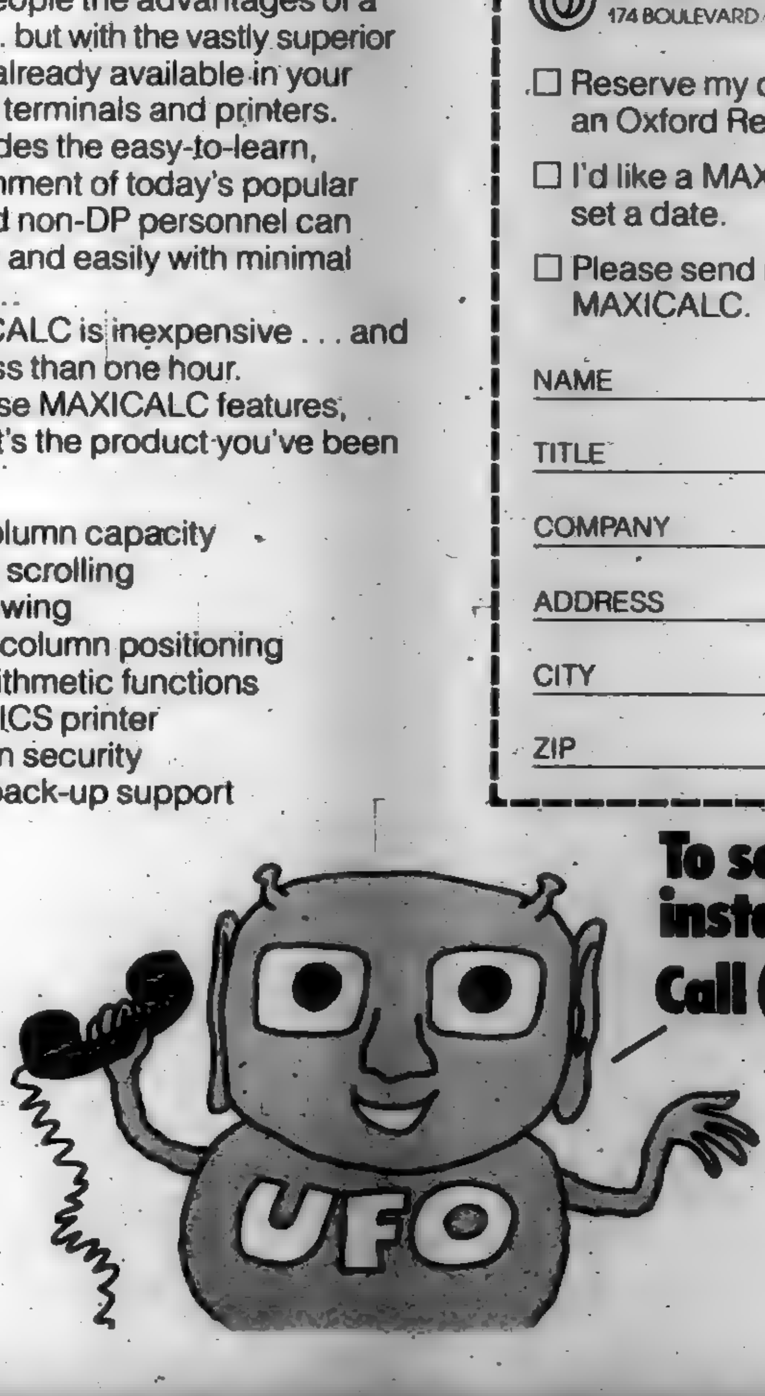

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From the requirements for a product, through the design and on to the actual finished product and shipment — every step of the manufacturing process is now being monitored by a computer. And DP/MIS departments are being asked to step in and make this process possible. If you're struggling with this now, or see this kind of demand in your future, *Computerworld's* April 25th Special Report on Manufacturing Systems is a "must read."

Stories to cover software, applications . . .

You'll get applications stories, tutorials, marketing information and original articles on everthing from manufacturing resources planning (MRP) to robotics and inventory and shop floor control.

You'll get a story from a lighting equipment manufacturer who uses a computing system to develop clean bills of materials, improve cash flow and other applications. You'll read about integrating CAD/CAM with technical publishing; you'll get a story about how one company runs milling off a computer to manufacture cataract lenses and lenses for subnormal vision.

And new products . . .

You'll get new product information — like an article from a major manufacturer about its new shop floor control systems designed for the "factory of the future," and an article about a software package that provides computerized analysis of manufacturing assembly procedures and financial tracking.

From an article on manufacturing software and how to evaluate it to a discussion of factory automation systems where combined U.S. exports of such systems reached a value of $322 million in 1981 — you'll get a detailed examination of the manufacturing systems marketplace that's designed to give you the whole picture.

DP/MIS Pros need to know.

If you're among the nearly 200,000 *Computerworld* readers employed in manufacturing firms — you'll need to be prepared to become involved in this vital new area of computing. As a DP/MIS professional, you're going to need the background and information this April 25th Special Report offers you on what's available to help your company take advantage of these incredible systems — if you're not already immersed in the process.

And if you sell manufacturing systems — you know how vital a part the DP/MIS professional plays in determining what products companies buy when they're looking at new manufacturing systems and software. Here's where you'll find your readers next April 25th — reading *Manufacturing Systems* in *Computerworld*. Your ad in this issue will insure them more complete information on the products in the field. Ad close for this Manufacturing Systems Special Report is April 8. Call your local salesperson at one of the offices listed below, or call Don Fagan, Vice President, Sales at (617) 879-0700.

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

BOSTON/Chris Lee, Ed Marecki, Joe Fitzhugh, Jim McClure, Kathy Doyle, Diane Sukey, *(617) 879-0700*
CHICAGO/Art Kossack, Newt Barrett, Chris Lee, *(312) 827-4433*
NEW YORK/Mike Masters, Doug Cheney, Ray Corbin, Joan Daly, Fred LoSapio, Gale M. Paterno, *(201) 967-1350*
SAN FRANCISCO/Bill Healey, Barry Milione, Theodora Franson, A.G. Germano, Eileen Dunn, *(415) 421-7330*
LOS ANGELES/Jim Richardson, Bob Hubbard, Beverly Raus, *(714) 556-6480*

Training Program Aids Software Installation

RALEIGH, N.C. — Global Software, Inc. has introduced an approach to implementing software for the IBM 4300 series, 370, 30 series, System/38 and System/34 or compatible systems.

Through the Software Walkthrough (Swat) method, Global makes a preinstallation visit to prepare the prospect for a trip to Global's headquarters for a hands-on training program and implementation of the client's system.

Global provides all conversion programs necessary for the client. Upon completion of the one-week program at Global, the client takes its system, files and customer reports back to its own company for installation.

The Swat method costs $7,500 for the week of training. Financial software packages such as general ledger, accounts payable, purchase order and standard cost range in price from $25,000 to $100,000, depending on hardware and features. More information is available from Global, located at 1009 Spring Forest Road, Raleigh, N.C. 27609.

Financial Modeling System Debuts

WINSTON-SALEM, N.C. — Information Management, Inc. has announced A+, a financial modeling system for the IBM System/38.

A+ was designed for the executive, non-DP user and is equation-oriented, which means the user works with familiar terms like profit and sales, not rows, columns or numeric representations.

Features include availability of an unlimited number of data lines by 96 columns, system guidance through model definitions, the ability to customize reports and have more than one report format per model, graphs displaying one or two data lines for comparison, the ability to copy models for consolidation of "what if" calculations without destroying original data, automatic present value calculations and documentation with a self-study guide.

A+ is available for $4,000 with an optional 30-day test period allowance. The firm is located at Suite 305, NCNB Plaza, P.O. Box 1154, Winston-Salem, N.C. 27102.

IBM Users Get Datamacs Update

VALLEY FORGE, Pa. — Management and Computer Services, Inc. (Macs) has announced an enhancement to its Datamacs automatic test data generator, said to expand a programmer's ability to create test cases in an IBM or compatible maintenance environment.

The Datamacs Command Language (DCL) enhancement reportedly can match and/or merge files; update direct-access storage device or Vsam files in place; convert files; and print records selectively.

DCL can also create interrelated files from scratch or from existing live files. DCL costs $6,000 from the firm at Great Valley Corporate Center, Valley Forge, Pa. 19482.

Program Aids Fit Prime 50 Series

WALTHAM, Mass. — Henco Software, Inc. has announced the System Specialist, a set of programming aids for Prime Computer, Inc. 50 series systems. The set includes Info, the company's relational data management system and fourth-generation language; the Info-Flow system, which generates automatic documentation of Info applications; and Info-Call, an applications interface that allows users of conventional languages to link programs with Info.

Info is an applications development tool that incorporates screen-formatted entry, data update, editing, data manipulation and ad hoc query, retrieval and reporting. It can join up to 10 files simultaneously, a spokesman said.

Info-Flow documentation includes cross-references and narratives for entire applications of any element. Info-call can be used to add Info features for data entry, screen formatting, interactive query and retrieval, menu-driven systems prototyping, relational data management and reporting to programs written in standard programming languages.

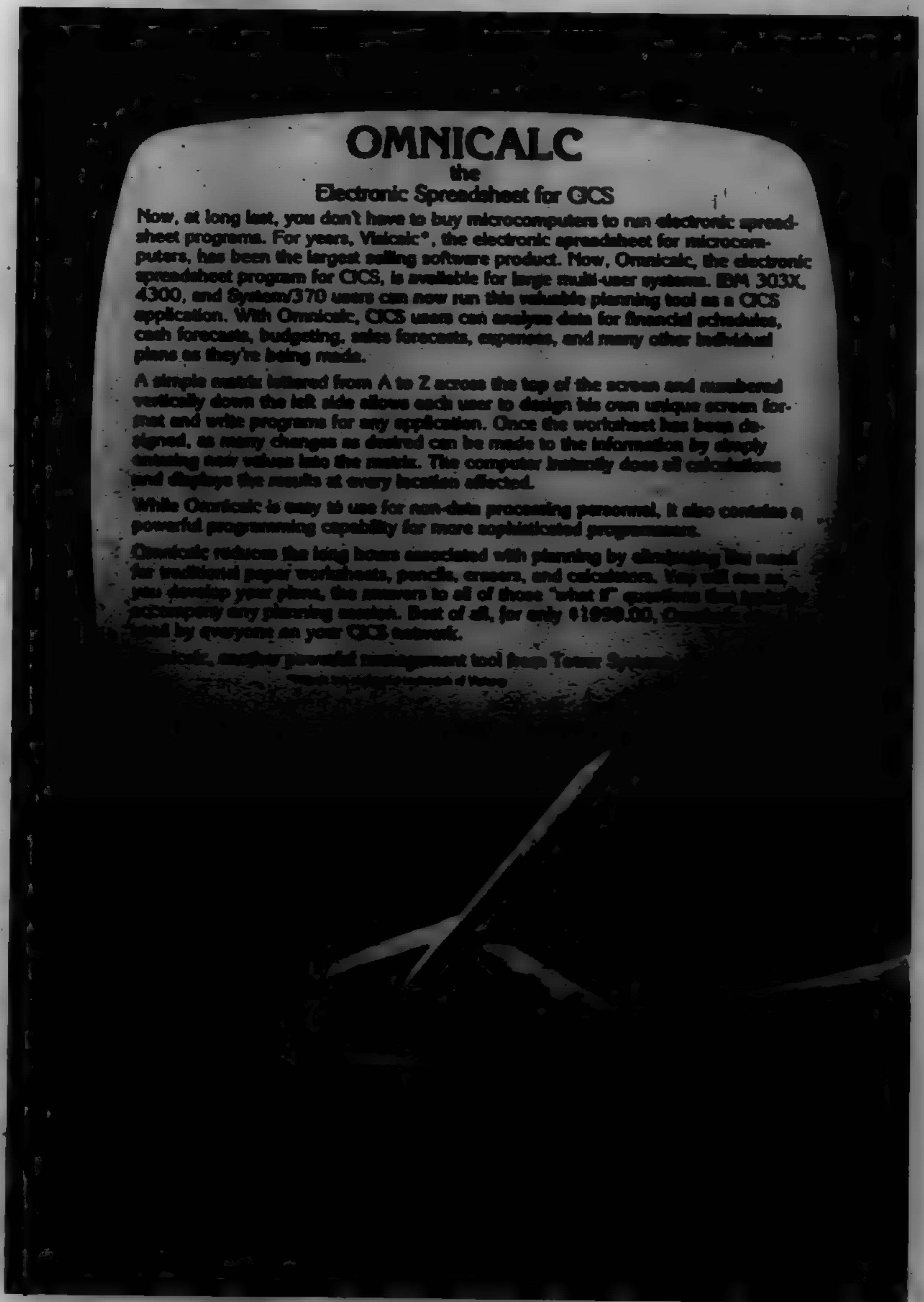
A one-time license costs $19,700 for the Prime 150 to 850 and $14,500 for the Prime 2250. Henco is located at 100 Fifth Ave., Waltham, Mass. 02154.

Administrative Tool Runs on DG Eclipse

NASHUA, N.H. — Computer Management Dynamics, Inc. has announced an integrated on-line administrative software package that runs on Data General Corp.'s Eclipse line of minicomputers.

The Integrated Student Information System reportedly handles admissions, registration, housing and alumni development; as well as a financial system with general ledger, receivables, payables, purchase orders, payroll and inventory control. It also features support systems that include word processor applications, report writing and graphics display, according to the vendor.

The software is priced at $100,000. The vendor is based at 5 Coliseum Ave., Nashua, N.H. 03063.



OMNICALC
the
Electronic Spreadsheet for CICS

Now, at long last, you don't have to buy microcomputers to run electronic spreadsheet programs. For years, Visicalc*, the electronic spreadsheet for microcomputers, has been the largest selling software product. Now, Omnicalc, the electronic spreadsheet program for CICS, is available for large multi-user systems. IBM 303X, 4300, and System/370 users can now run this valuable planning tool as a CICS application. With Omnicalc, CICS users can analyze data for financial schedules, cash forecasts, budgeting, sales forecasts, expenses, and many other individual plans as they're being made.

A simple matrix lettered from A to Z across the top of the screen and numbered vertically down the left side allows each user to design his own unique screen format and write programs for any application. Once the worksheet has been designed, as many changes as desired can be made to the information by simply entering new values into the matrix. The computer instantly does all calculations and displays the results at every location affected.

While Omnicalc is easy to use for non-data processing personnel, it also contains a powerful programming capability for more sophisticated programmers.

Omnicalc reduces the long hours associated with planning by eliminating the need for traditional paper worksheets, pencils, erasers, and calculators. You will see as you develop your plans, the answers to all of those "what if" questions that [illegible] accompany any planning session. Best of all, for only $1990.00, [illegible] used by everyone on your CICS network.

[illegible], another powerful management tool from Tower Sys[illegible]

*Visicalc is a registered trademark of Visicorp

Test Plan Standards Portfolio Released for DP

VALLEY FORGE, Pa. — Management and Computer Services, Inc. has released a free portfolio of test plan standards that reportedly can be adapted by DP departments faced with the need to improve software staff productivity and/or the need to implement quality assurance programs.

The standards reflect a range of operating environments and are designed to address the structuring of a test environment and development of procedures to control the substantial portion of the life-cycle effort devoted to testing, according to a spokesman for the vendor.

The vendor said the standards were developed in conjunction with hundreds of clients over the last five years. The firms implementing the techniques reportedly are experiencing a 20% reduction in life-cycle development and up to an 80% reduction in ongoing maintenance costs, the spokesman maintained.

The use of the standards does not require Management and Computer Services' software products to gain improvements.

Actual test plan standards reflecting different levels of discipline from users are supplied in the portfolio, along with one testing standard from the vendor's internal manual, the spokesman said.

Included are a formal plan from a federal agency; an abbreviated, simplistic but absolute standard from a joint venture of major financial institutions; and a more liberal tutorial approach permitting considerable individual flexibility, according to the vendor spokesman.

The plans being made are said to complement and compare with those endorsed by organizations such as the Institute of Electronics and Electrical Engineers and the Data Processing Management Association, as well as DP auditors.

The package may be obtained, at no charge, by contacting Management and Computer Services at Great Valley Corporate Center, Valley Forge, Pa. 19482.

DEC Users Get Versions Of M/aps, KBM, APC, ENC

ELM GROVE, Wis. — McHugh, Freeman and Associates, Inc. has announced new versions of its Menu/Authorization Processor System (M/aps), the Keyboard Master (KBM), the Automatic Password Changer (APC) and the Data Encryption Package (ENC) for users of Digital Equipment Corp. computer systems.

M/aps, which provides secured menu access and argument passing, has been upgraded to provide a new security display feature said to allow the system user to view only those menu items the user can access. Passwords can be required of selected menu items as additional security, a vendor spokesman said.

KBM, which allows the system manager to monitor and interact with user sessions, now allows selective monitoring of designated user accounts or keyboard numbers under control of DEC's Login software, the spokesman maintained.

APC, which automatically changes user passwords using words provided in an encrypted 3,000-word dictionary, has been enhanced to allow a single user account or account project to be changed.

ENC, which encrypts source, data and task image files, has been upgraded to provide notification of aborted attempts to decrypt encrypted files, a spokesman said.

KBM and APC run under the RSTS operating system and sell for $500 and $350, respectively. M/aps and ENC run under RSTS, RSX and VMS operating systems and sell for $995 and $1,250, respectively. The company is at 1135 Legion Drive, Elm Grove, Wis. 53122.

SMG T/S Service Uses Anvil-4000

WILLOUGHBY, Ohio — Figgie Systems Management Group, Inc. (SMG) has announced a time-sharing service that utilizes the Anvil-4000 computer-aided design/computer-aided manufacturing system developed by Manufacturing & Consulting Services, Inc. of Irvine, Calif.

Anvil-4000 is a two- and three-dimensional interactive graphics system that provides geometric modeling and analysis, mechanical drafting, file management, view and scale manipulation and numerical control tool path generation, a spokesman maintained.

The company will install graphics and communications equipment and provide a five-day introductory training course on Anvil, according to the vendor spokesman. Pricing is based on equipment installed, line charges and volume, the vendor spokesman said.

SMG is located at 4420 Sherwin Road, Willoughby, Ohio 44094.

The MICRO/MAINFRAME Connection....
The experts say it doesn't make any sense to wait.

Bull?

Two essential seminars that save you time, money, and let you cut through the Bull.

As a DP/MIS Manager you're being squeezed. Micros are pouring through the door like water...end-users are trying to tackle your application development backlog, and they're coming to you for advice on the technology they need to do it. At the same time, salespeople are telling you that all the pieces are available now, and that they have the ideal solution for your needs.

The pressure is on. But how do you afford the time to examine all the available products, cut through the marketing dazzle, and determine which products, if any, can help you get the job done, bring everything back together, and stay ahead of the game?

Software and Micro Decision Symposiums
Independent in-depth analyses

Each two-day symposium provides you with the opportunity to find out the real story, and about the various products and implementations themselves.

Merlyn Software and Micro Decision Symposiums present a remarkable opportunity for today's DP/MIS Management to quickly find out which claims can be delivered, and which are Bull. Here are some comments from past attendees:

"...extremely informative. I would estimate that we saved some three months of research. The presentation was truly unbiased and a refreshing change."

Jeanette Pearman
Information Center Manager
Albuquerque National Bank

"We thought we had done our homework beforehand...but we found so many new insights into the competing products that most of our preliminary legwork was invalidated. I can't imagine any attendee not getting more than his money's worth of decision support from the Software Decision Symposium."

William D. Masters
Michael Reese Hospital
and Medical Center

"Most helpful...anyone reaching a point where a decision is to be made should not do it before attending this symposium."

Henri Robitaille
Le Soleil Limitee

Microcomputers in a Mainframe World.
The end-users way out...or yours?

The Microcomputer, as we know it today, is only the beginning of a renaissance that already makes the Industrial Revolution look like a day at the beach, and will alter the way everyone looks at, deals with, and handles information in the future. The problem is it's come so quickly that there's been little time for understanding the technology, let alone formulating strategies for integration.

So, where do you start? How do you quickly assemble and exploit an effective microcomputer strategy, and still cope with your day-to-day problems?

The Answer

Here's what the Micro Decision Symposium offers:

DAY 1

- What are the selection, configuration, and acquisition criteria you should be considering?
- Compatibility...what's at issue?
- How do you effectively compare micro hardware and software?
- How do you integrate micros into the overall information systems strategy?
- What about security, data integrity, recovery, and auditability?

DAY 2

- What are the capabilities and limitations of the major hardware and software products?
- What are the real-world communications issues?
- How do you maintain and support micros?
- When do you use a Systems Integrator?
- How do you efficiently keep track of what's going on in the industry?

Schedule:

Seattle	April 20-21	Boston	May 17-18
San Francisco	April 27-28	New York City	May 24-25
Dallas	May 3-4	Baltimore	June 15-16
Chicago	May 10-11	Toronto	June 28-29

The Information Center and the Development Center
Can you really accelerate the applications development process on your mainframe?

Application generators, productivity tools, end-user query systems, database management systems, new methodologies. They all claim to be just what you need....instant answers to the backlog crisis.

But, realistically, how effective are the application generators? What do the so-called 'integrated' database management systems offer, and what are the risks of committing to such a solution? In the hands of the programming professional or the end-user, what are the strengths and weaknesses of the fourth generation languages?

The Answer

Here's what the Software Decision Symposium offers you:

DAY 1

- What is a Development Center?
- What are the different types of application generators?
- Do you need an integrated database management system?
- What are the management and implementation strategies?
- What products are available, and how do they compare?

DAY 2

- What is an Information Center?
- What types of jobs lend themselves to end-user development?
- What types of software should be available?
- What are the management and control issues?
- What products are available, and how do they compare?

Schedule:

New York City	May 3-4	Chicago	May 25-26
Pittsburgh	May 11-12	Toronto	June 8-9
Baltimore	May 18-19	San Jose	June 14-15

To Register:

To register, or get more information, call (800) 241-9970 or (404) 252-0516. Price per person is $595. If more than one attendee registers from the same company, in either symposium or any city, the second and subsequent registrants receive a 25% discount. The fee, which must be paid in advance, includes symposium coursebooks, all meeting materials, lunches, coffee breaks and a cocktail reception at the end of the first day.

If your schedule won't permit you to attend, expanded coursebooks sets, covering each symposium, are available for $495.

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So, for just $37,995,* you pick a computer that really helps you with your long-range business planning. It has the power to handle up to 56 people at the same time. Do a wide range of interactive jobs, plus word processing, business graphics, accounting, inventory control, order entry and a lot more. With plenty of power to spare for batch processing, too.

You can increase main memory from 256 Kb to 2 Mb, with up to 3000 Mb of disc storage. Add an array of HP peripherals. And network it with other HP 3000s, as well as with your central computer. But the beauty of the Series 39 is that, as part of the HP 3000 family, it will keep growing with you almost indefinitely.

For the business computer with endless possibilities, call the local HP office listed in your phone book and ask for the Business Computer Staff Department. Or write for information to Nancy Valby, Hewlett-Packard, Dept. 03175, 19447 Pruneridge Avenue, Cupertino, CA 95014.

In Europe, write to Henk van Lammeren, Hewlett-Packard Nederland B.V., Dept. 03175, P.O. Box 529, 1180 AM Amstelveen, The Netherlands.

Small system price. Big system power.

HP 3000 Series 39 features include:

Hardware

- 256 Kb to 2 Mb main memory
- 28, 65, 132, and 404 Mb disc drives (fixed or removable) with integral cartridge tape backup
- 400, 600 and 1000 lpm system line printers; Laser Printing System
- 180 cps dot-matrix and 40 cps daisy-wheel printers
- Cartridge tape drives
- 1600 and 6250/1600 bpi magnetic tape drives

Software

- Multiprogramming Executive Operating System
- Data Base Management System
- Office Systems Software
- Programmer Productivity Tools
- Manufacturing Application Software
- Financial Applications Software
- Distributed Systems Network Software
- Performance Measurement Tools
- High Level Languages
- Utilities

47302

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*U.S. list price includes a system processor with 256 Kb memory, 4 terminal ports, the HP [illegible] console/terminal and [illegible] Mb disc storage with cartridge tape backup.

Reporting Tool Introduced For IBM System/38 Users

MILL VALLEY, Calif. — Fusion Products International has announced Fusion 4/38, a reporting tool for the IBM System/38.

Fusion 4/38 is said to allow nontechnical users to extract and produce reports from any data resident in their computer system. It can also perform mathematical calculations and custom document formatting and can be interfaced to a variety of output devices.

A data dictionary controls and provides access to any piece of information defined to the system, a spokesman said. The dictionary also stores a standard heading for the element, its decimal alignment and standard display format.

The interactive package formats and presents report data one page at a time at a specified display device. A preview option permits the requestor to verify the output format before executing the request.

Fusion 4/38 supports all standard IBM terminals and printers, as well as other output tools. Media independence modules can be expanded to support the network protocols that control information distribution such as local-area networks and personal computer clusters.

The package costs $5,000 in single-order quantities from 317 Miller Ave., Mill Valley, Calif. 94941.

For System/34

'Vakpak-Educator' Unveiled

SPARTANBURG, S.C. — Innovak International, Inc. has announced Version 3 of its Vakpak-Educator package for the IBM System/34. Vakpak is designed for use by secondary, post-secondary, vocational and technical schools.

The financial management system includes general ledger, personnel, payroll, accounts payable with purchase order encumbrance and fixed assets. The student administration system includes attendance, grading, grade reporting, scheduling, student records, registration, preregistration, accounts receivable and financial aid.

The package is written in RPG-II and requires a minimum of 64K bytes of memory and a 27M bytes of disk storage. A permanent license fee costs $33,600 from the vendor through Box 6308, Spartanburg, S.C. 29304.

Newsletter Out For Unix Users

MT. CARMEL, Conn. — Southwater Corp. will publish a quarterly newsletter for users and vendors of Bell Laboratories' Unix operating system and the C programming language.

Called "World Unix & C," the publication provides company profiles and tutorials as well as new developments, new product descriptions, interviews with product marketing personnel, user interviews, company profiles, book reviews, product reviews and person and project notes, a vendor spokesman said.

The newsletter costs $12 annually when paid by check or credit card and $16 when invoiced from 30 Mowry St., Box 5314, Mt. Carmel, Conn. 06518.

Prices Slashed For Ceads-Cadd

EL PASO, Texas — Holguin and Associates, Inc. and Hewlett-Packard Co.'s Independent Software Supplier Program (HP-Plus) have announced a major price reduction and new pricing schedule for the Ceads-Cadd automated drafting package.

New prices for the complete package, including plotter, start at $64,000, a price reduction of $11,000, according to the vendor.

The software package is now available on the HP 1000 series of computer systems: Series F, A600, A700 and the new A900 system.

More information is available from Holguin & Associates, 5822 Cromo Drive, El Paso, Texas 79912.

Harris Enhances System/38 Aid

MILWAUKEE — Harris Data Service, Inc. has announced Release 1.2 of its Accounts Payable software for the IBM System/38.

Enhancements to the software include an inquiry into the open voucher file by vendor number, allowing the user to display a list of all vouchers for a particular vendor and a default expense account number in the vendor master file.

Also, vouchers can be entered and checks printed for temporary vendors, with name and address information for temporary vendors entered at the same time as the voucher. Expenses entered for future periods are now transferred to the general ledger as deferred expenses, a vendor spokesman said.

The software package carries a one-time purchase price of $4,500 and is available from the vendor at 11629 W. Dearbourn Ave., Milwaukee, Wis. 53226.

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*VT100 is a registered trademark of Digital Equipment Corporation.

RESOURCE USAGE BY PROGRAM AND JOB
ANALYSIS OF VSE/POWER ACCOUNT DATA

		CPU TIME IN SECONDS			I/O COUNT	
		NUMBER OF EXECUTIONS	SUM	MEAN	SUM	MEAN
PROGRAM	JOB NAME					
DSERV	DSERV	1	2.08	2.08	311	311
	RESTORY3	1	0.72	0.72	1499	1499
DTSANALS	ICCFCICS	9	110.44	12.27	34596	3844
DTSINIT	ICCFCICS	4	364.80	91.20	52771	13193
DTSUTIL	ZAPTONVS	9	4.49	0.50	3227	359
LNKEDT	LETSFDTR	3	4.15	1.38	1479	493
	LINKDSR	2	0.88	0.44	708	354
	LINKFDRA	1	2.30	2.30	650	650
	LINKMATR	6	10.74	1.79	7072	1179
OBJMAINT	DRRZAPS	1	0.36	0.36	403	403
PDZAP	DRRZAP	1	0.60	0.60	674	674
PLIOPT	GRANKS	1	5.16	5.16	4157	4157
	MATRIX10	5	52.92	10.58	40619	
POWERJA	POWER/VS	4	226.12	56.53		
RESTORE	RESTORY3	1	2.38			
	SASLOAD	1	0.28			
RSERV	LETSFDTR	6	6.25			
	LINKFDRA	1	4.93			
SASVSE	ACCTEST1	3	20.35			
	ACCTEST2	0	81.44			
	ACCTEST3	1	12.01			
	ACCTEST4	4	73.96			

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In addition to routine performance [illegible] the SAS System provides extensive [illegible] retrieval tools. [illegible]

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The SAS System is available outside the USA from the Institute's subsidiaries in Heidelberg, West Germany; Weybridge, Surrey, UK; Wellington, New Zealand; and Sydney, Australia; and from licensed distributors in Tokyo, Japan; Milano, Italy; [illegible] and Singapore.

SAS saves time.

Training Package Runs on IBM Micros, CPUs

AVON, Conn. — A self-study training package usable on an IBM Personal Computer or IBM mainframe (with an Interactive Instructional System) for developing leadership skills in computer center management personnel has been announced by Computer Systems Research, Inc. (CSR).

The Data Center Manager Series contains five courses aimed at the medium or large-scale data center. Course titles include "Data Center Organization Structures and Functional Responsibilities," "Personnel Resource Management" and "Data Center Planning & Objectives."

Also included are "Management of Change & Quality Performance" and "Budgeting, Rate Development and Chargeback Systems." Prices range from $1,500 to $2,500 per course module. The complete series costs $6,000.

CSR is located at Avon Park S., 40 Darling Drive, Avon, Conn. 06001.

System/34 Gets Distribution Management

METAIRIE, La. — D.A. Richards Corp. (Darcor) has announced an interactive, on-line Distribution and Service Management package for the IBM System/34.

The system accommodates inventories in excess of 40,000 items, a spokesman said. Pricing is possible on a per customer basis. The system tracks service jobs, provides status information and prints customer statements, invoices, purchase orders and picking/packing slips.

Reporting features provide status-of-item activity, service jobs, customer orders and back orders, accounts receivable and item and customer pricing. Inventory valuation is by the last-in, first-out method.

It costs $9,600 from Darcor at 3349 Ridgelake Drive, Metairie, La. 70002.

Directories For Software Released

NEW YORK — Elsevier Science Publishing Co., Inc. has released *The Software Catalog* for users and buyers, said to contain two directories for minicomputers and microcomputers, each available twice a year and describing more than 20,000 software products.

Features reportedly include software/system compatibility information; continuous updating via two editions annually and two intermediate updates; complete cross-referencing by computer (make and model), application, operating system, keywords, vendor, microprocessor and programming language; and optional support services.

The Software Catalog is said to be a successor to Imprint Software, Ltd.'s *The International Software Directory*. The data used in compiling the catalog was derived from the International Software Data Base operated by Imprint.

The 800-page microcomputer directory costs $69 for the spring edition and $15 for the update. The 560-page minicomputer directory is priced at $95 for the spring edition and $18 for the update.

Elsevier Science Publishing is located at 52 Vanderbilt Ave., New York, N.Y. 10017.

CICS DOS VS
[illegible]

IFCP opens and closes CICS files from batch partitions with a single execute statement.

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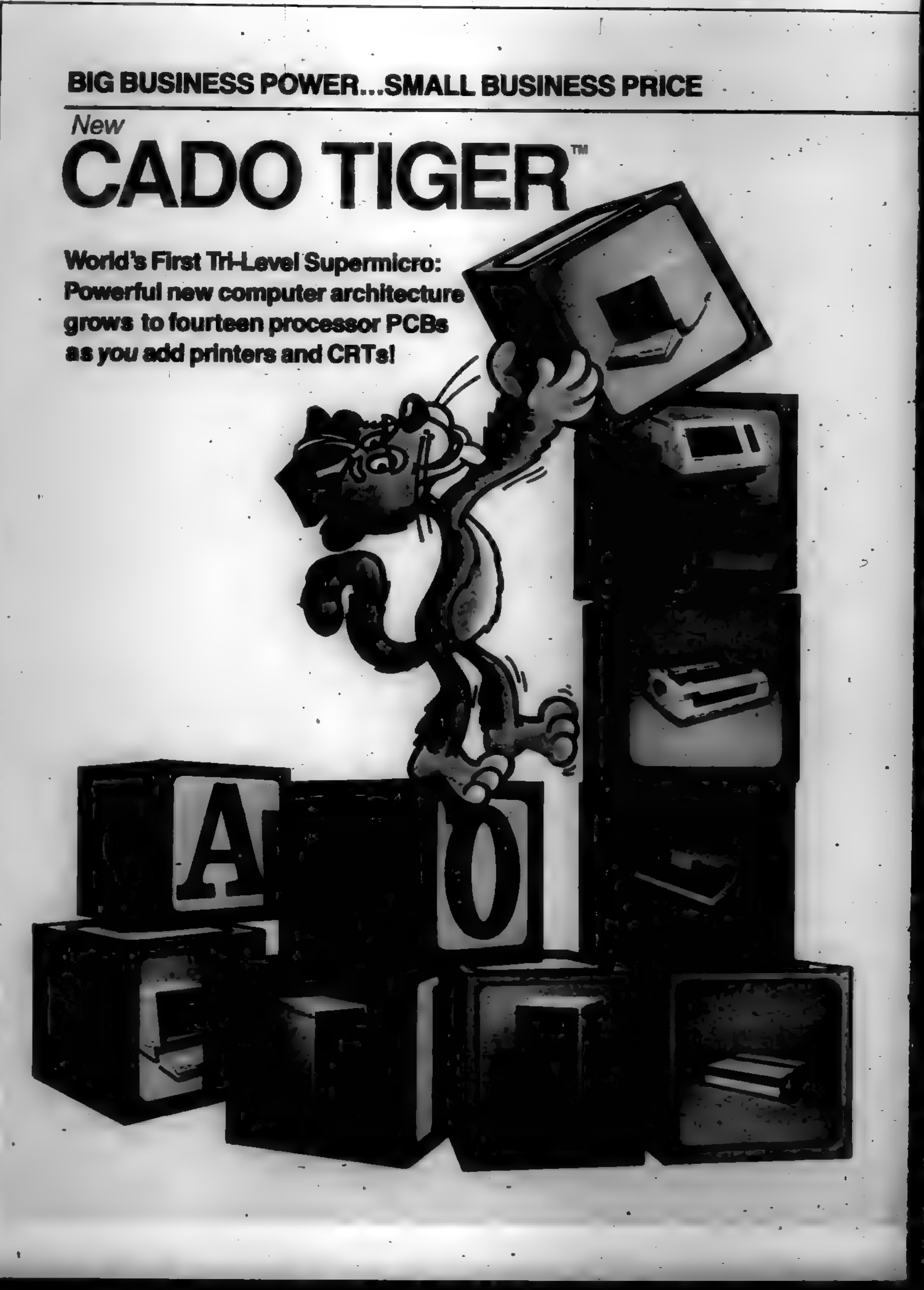
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Powerful new computer architecture
grows to fourteen processor PCBs
as *you* add printers and CRTs!
A
O

European Economic Data Bases Available in U.S.

VAN NUYS, Calif. — Cisinetwork Corp. has announced the availability in the U.S. of two European economic data bases — Comext and Cronos — that are produced and maintained by Eurostat, the Statistical Office of the European Communities.

Comext, a trade data base, reportedly covers imports and exports of over 8,000 products between the European Community nations and all of their trading partners. It includes three years of monthly trade history and uses the European Community's Nimexe nomenclature, which provides maximum detail. Cross-indexing with the United Nations Sitc classification system is also available.

Cronos, a source of European macroeconomic data, is said to have a special data base covering the developing countries and provides comparative statistics for the U.S. and Japan. The data base contains over 600,000 time series and is updated monthly by Eurostat.

Both data bases are available on-line via local telephone numbers on the worldwide Cisinetwork time-sharing system. More information is available from Cisinetwork, 16625 Saticoy St., Van Nuys, Calif. 91406.

General Ledger Tool Fits HP 3000

TULSA, Okla. — Hinderliter Management Systems has unveiled a general ledger package for Hewlett-Packard Co.'s HP 3000 family running under HP's MPE operating system. The package utilizes HP's Image data base management system and Hinderliter's Menu/3000 security menu system.

The Accounting Information Management System (AIM/3000) reportedly utilizes an advanced data base structuring technique to provide greater information access for all levels of the organization.

The on-line, interactive package includes comprehensive budgeting and allocation processing modules, permits user-defined, fully independent accounting periods, is parameter- and menu-driven and provides control of data security by restricting programs via the system menu, as well as restricting users by device and/or password.

AIM/3000 has a license fee of $9,000 and includes a report writer, security system, training, implementation assistance and a complete set of user documentation. A 30-day trial demonstration tape with documentation is available for a fee of $150, which can be credited toward the system purchase. More information is available from Hinterliter Management Systems through Box 35505, Tulsa, Okla. 74153.

Burroughs Users Get Utility Aids

JACKSONVILLE, Fla. — Jacksonville Software Services, Inc. has announced three utility programs for Burroughs Corp. large systems users.

Intersort reportedly enables the user to sort disk files by entering parameters at a terminal. It costs $695.

Interquery is said to allow the user to examine and modify data in any selected disk file. Data can be specified for display or hexidecimal formats. It costs $695.

Cryptolock is a file encryption system priced at $1,295 from the firm at Suite 234, 7555 Beach Blvd., Jacksonville, Fla. 32216.

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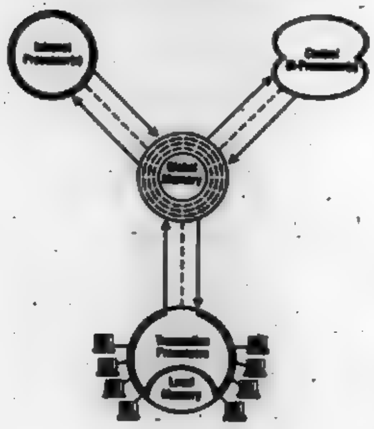

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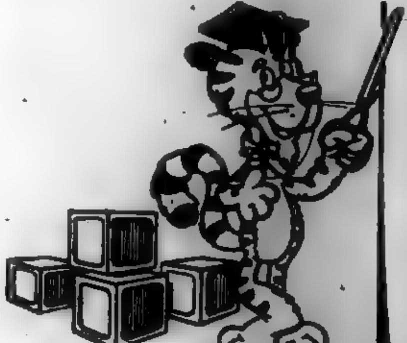

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Job Scheduler Fits System/38

CAPE GIRARDEAU, Mo. — An automatic job scheduler for the IBM System/38 has been developed by Data Trans-Formation, Inc.

The package reportedly allows users to schedule any user program, control language program or control language command to be run automatically at an assigned time and frequency.

Each job to be scheduled by the package is described by using a data entry screen, and users reportedly can specify scheduling for every day of the week and specific days of the week or month.

The software costs $235 from the firm through P.O. Box 1541, Cape Girardeau, Mo. 63701.

Distribution System Runs on DG

ARMONK, N.Y. — Exact Systems and Programming Corp. has announced a package for distributors, authorized representatives, retail stores and sales organizations. The package runs on Data General Corp. computers under the AOS, AOS/VS and Rdos operating systems.

The system is composed of seven basic modules, a spokesman said. The order entry module processes orders and performs validations, price lookups, customer profiles and order filling requirements.

The inventory modules process inventory stored at and shipped from any location. The invoicing module provides invoices for goods as they are shipped.

The sales analysis module presents gross and net of returns figures of merchandise categories, the company claimed.

The returns subsystem provides input to the inventory system to affect stock levels, adjusting of early warning and/or short supply tracking routines.

All accounting is performed by Accountbase, an integrated system that includes accounts receivable, accounts payable and general ledger. The production orders module is a means to order, control the order and track the receipt of raw materials.

The price for the distribution system begins at $25,000 for a full system, the spokesman said from One Labriola Court, Armonk, N.Y. 10504.

Payroll Software Announced for HP 250

FOREST HILL, Md. — A payroll software package for the Hewlett-Packard Co. HP 250 has been introduced by Maryland Computer Services, Inc.

PR250 features user-defined tax tables, the ability to handle salaried and hourly employees, an unlimited number of deductions and produces management reports.

The software also reportedly can change passwords, handle two different types of overtime rates and can print to a spool file. The package costs $1,500 for the first copy, $1,000 for every copy thereafter or an unlimited license for $10,000. A demonstration disk costs $150. Software Subscription Service is available for $25/mo for the first copy and $10/mo for every copy thereafter.

The firm is located at 2010 Rock Spring Road, Forest Hill, Md. 21050.

Hospital Series Fits System/38

SAN DIEGO — Integrated Systems Management, Inc. has announced the Integrated Hospital Management System, a series of software modules for IBM's System/38.

Modules include patient registration, patient billing, accounts receivable, inventory control/purchasing, accounts payable, general ledger and unit dose pharmacy, the vendor spokesman said.

The combined price of all the modules is $115,000.

Modules can be purchased separately, the vendor said from Suite 344, 2515 Camino Del Rio S., San Diego, Calif. 92108.

PVI Establishes Library to Serve 'DI-3000' Users

BOULDER, Colo. — Precision Visuals, Inc. (PVI) has established an application library for users of its DI-3000 and Grafmaker graphics software.

The firm will act as a clearinghouse for user-developed graphics applications, maintaining abstracts on all programs and distributing the library for a modest fee.

Access to the application library is open only to PVI customers who have an up-to-date maintenance agreement in force. Customers who submit one program to the library will receive all library programs for a nominal distribution fee.

Those without a program to submit can receive for $250 the PVI-developed library programs only. PVI is located at 6260 Lookout Road, Boulder, Colo. 80301.

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We recently did a study of *Computerworld* subscribers to determine their level of involvement and interest in communications. Of the 84% now using or planning to use communications equipment and services, 72% are personally involved in its selection and/or implementation. We found that these subscribers depend on *Computerworld* for communications information and prefer its coverage by more than 4 to 1 over the next publication in the field. This segment of our audience has a critical need for in-depth information on the constantly changing technology of communications.

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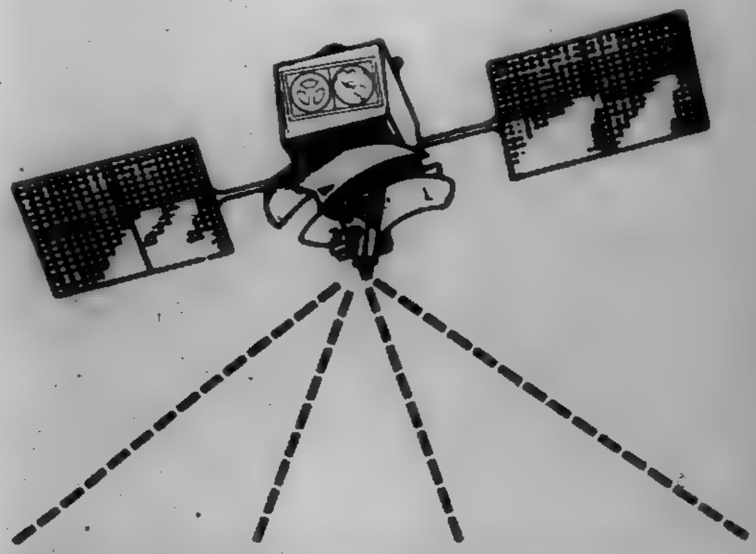

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Micro Notes

Microtek, Inc. has announced **Q-PAC**, a spreadsheet enhancement package for users of Apple Computer, Inc. Apple II and Apple IIE processors. The package is designed to operate with Visicorp's Visicalc. It consists of the Q-Disk 128K-byte disk emulation system, an 80-col. screen card and the firm's Visi-Expand-80, a software enhancement to Visicalc. The software costs $699, the vendor said from 9514 Chesapeake Drive, San Diego, Calif. 92123.

Pammac Corp. has announced a productivity management package for users of Digital Research, Inc.'s CP/M operating system. Called **PM 3000**, the package includes the ability to monitor the progress of specific projects, products, employees in training, machine downtime or virtually any measure of production flow. It costs $997, the vendor said from 1121 San Antonio Road, Palo Alto, Calif. 94303.

Strobe has announced two graphics packages for users of Digital Research, Inc.'s CP/M operating system and the firm's Strobe 100 graphics plotter. **Business Graphics I and II** is a combined package for the production of pie and bar charts, logarithmic and nonlinear scales. It costs $145. **Strobeview** is a menu-driven package for the production of flow charts and organizational charts as well as transparencies. The package costs $75, the vendor said from 897 5A Independence Ave., Mountain View, Calif. 94043.

Whitesmiths, Ltd. has announced **Pascal and C compilers** for use with the Digital Equipment Corp. Professional series of personal computers. Pascal and C functions may be intermixed in one program and all DEC Professional Library routines may be called from Pascal or C programs. Licenses start at $1,100, a spokesman said from 97 Lowell Road, Concord, Mass. 01742.

Statistical Graphics Corp. has announced **Statgraphics.PC**, an interactive data analysis and statistical graphics system for the IBM Personal Computer. The package requires the PC DOS operating system, at least 192K bytes of random-access memory, one disk drive, color/graphics adapter and corresponding monitor. A one-time license fee costs $225 with additional licenses priced at $40 from the firm through P.O. Box 1558, Princeton, N.J. 08540.

Chang Labs has introduced release 4.0 of **Microplan**, its high-end electronic spreadsheet for Digital Research, Inc. CP/M and Microsoft, Inc. MS-DOS operating systems. The new release includes a statistical package, monthly loan amortization and a feature that permits the user to see the impact of loan structure on cash flow. It costs $495 from Suite 200, 5300 Stevens Creek Blvd., San Jose, Calif. 95129.

Software Publishing Corp. has announced the availability of three of its information management software products on the Apple Computer, Inc. Apple II and Apple IIE computers. **PFS:File** is a computerized filing and summary system; **PFS:Report** sorts, calculates, formats and prints reports; and **PFS:Graph** produces bar, line or pie charts. Each package costs $125 from 1901 Landings Drive, Mountain View, Calif. 94043.

Fujitsu Microelectronics, Inc. will make Digital Research, Inc.'s **Concurrent CP/M** operating system available as an option on Fujitsu's line of Micro 16 personal business computers. The option costs $350, a spokeswoman said from Fujitsu's Professional Microsystems Division, Suite 103, 2840 San Tomas Expwy., Santa Clara, Calif. 95051.

Trax has developed software said to support file transfers between Apple Computer, Inc. Apple II and IBM Personal Computers. **Direct Connect** reportedly does not require any communications adapter or serial interface. The product costs $170 from Trax at 8948 W. 24th St., Los Angeles, Calif. 90045.

Packages Debut For System/34

NEENAH, Wis. — Advanced Information Management, Inc. has heralded three software packages for the IBM System/34.

The Library Documentation module costs $200. The Programmer's Utility Aid, said to expedite library and file management requirements, costs $200, according to a spokesman for the vendor.

The Data Base Conversion module reportedly will automate a conversion from a System/34 to a System/38. That module costs $1,000 from the firm at P.O. Box 39, Neenah, Wis. 54956.

Sorting Tool Bows for Users Of NCR 151s

CINCINNATI — Convex Resources has announced a sorting product that is said to allow users of NCR Corp. 151 or higher computers to cut Magnetic Ink Character Recording (Micr) document sorting in half.

Sortex examines the distribution of documents on the first pass through the Micr sorter, then makes better use of the available pockets in the following passes, a vendor spokesman said.

Sort savings depends on the number of available pockets, the spokesman said.

Sortex runs on the B1, B3 or VRX operating systems and will drive the 670, 671, 675, 6770 or 6780 Micr sorters, according to the vendor spokesman. The perpetual license price is $1,750 from the company's marketing agent, Software Clearing House, at 771 Neeb Road, Cincinnati, Ohio 45238.

Remember the Seminar of 1776?

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DP Vendors Ink Pacts With PBX Firms

By Bruce Hoard
CW Staff

Recent agreements between major computer vendors and telecommunications manufacturers are moving the DP industry as a whole toward the long-sought goal of wide-scale, computer-independent compatibility. They also shed light on the battle of networking technologies.

The driving force in both cases is an explosive office automation marketplace with private branch exchange (PBX) and word processor segments that will together result in $6.4 billion in revenues by 1986, according to International Data Corp.

Computer giants like Digital Equipment Corp., Sperry Univac, Hewlett-Packard Co. and Data General Corp. are joining forces with such telecommunications heavyweights as Northern Telecom, Inc., Rolm Corp. and newcomer Intecom, Inc. to capture that lucrative market.

DEC has inked agreements with Rolm and Northern Telecom aimed at integrating its All-In-One family of office automation products with the Rolm CBX and Northern Telecom SL-1 voice-data PBXs. HP announced at the recent Office Automation Conference in Philadelphia that it is making its HP 3000 mainframe and CRT terminals compatible with the CBX, SL-1 and Intecom's IBX. The firm said it will be looking to conclude similar deals in the near future.

Analysis

The DG-Northern Telecom deal is especially significant because it links the Northern Telecom Displayphone — a desktop combination telephone-CRT terminal — with DG's CEO office automation products. As a result, CEO users will have access to the SL-1 and a popular terminal product previously incompatible with their systems.

Such reciprocity will provide users with the opportunity to evaluate competing products under comparable conditions while pressuring other computer and communications companies to test their wares in a newly competitive marketplace.

This kind of trend is a dark portent for companies like Datapoint Corp., which has been striving to succeed as a vertical supplier of PBX and office automation terminal equipment. Potential users may well ask themselves why they should get locked into a single vendor when they can capitalize on the fruits of a competitive market.

(Continued on Page 68)

Unit Compatible With BSC Lines

REDMOND, Wash. — Peripheral Technology, Inc. has introduced a terminal said to provide IBM users with an economical way to implement remote terminal support.

The Scat X terminal is plug-compatible with IBM's Binary Synchronous Communications lines. It operates as an IBM 3278 in either a stand-alone or a cluster environment and supports either copy or addressable printers, a spokesman for the vendor said. It has a 14-in. diagonal, nonglare screen and a detachable keyboard. The terminal interfaces RS-232 or RS-422 over dedicated, dial-up or multidrop communications lines, the spokesman said.

Scat X terminals are available for $1,295 and Peripheral Technology is located at 14784 N.E. 95th St., Redmond, Wash. 98052.

Link Workstations to CPUs Using SNA

Convergent Aids Introduced

SANTA CLARA, Calif. — Convergent Technologies, Inc. has introduced software said to allow its distributed intelligence desktop workstations to communicate with IBM mainframes using Systems Network Architecture (SNA).

CT-SNA, comprising three distinct products, reportedly allows up to 16 workstations to communicate with a mainframe using one communications line.

The SNA Network Gateway provides low-level communications services between the Convergent cluster and the mainframe. The SNA/IBM 3270 emulator supports high-level presentation services from the Convergent workstation in the cluster to the mainframe via the SNA Network Gateway.

The SNA/RJE, available later this year, will allow files to be transmitted between a Convergent cluster and a mainframe. The SNA/IBM 3270 emulator, bundled with the SNA Network Gateway, costs $2,000 for a single copy from the vendor at 2500 Augustine Drive, Santa Clara, Calif. 95051.

Harris Enhances D1200 PBX

NOVATO, Calif. — Harris Corp. has introduced an enhancement for its D1200 private branch exchange (PBX) system said to permit user-programmable moves and changes as well as systems diagnostics, both remotely and on-site.

Program changes can be made using a personal computer that runs the Digital Research, Inc. operating system, CP/M. The system's enhanced design is said to permit the alteration of extension numbers, trunk and station assignments, toll restrictions and other parameters.

The D1200 family of PBXs accommodates up to 1,000 lines and trunks and offers such features as automatic route selection and station message detail recording.

Systems already in place can be retrofitted from $5,000 to $6,000, depending on the age of the system. More information is available from Harris, Digital Telephone Systems Division, Novata, Calif. 94948.

Laserlink Models Announced

EDISON, N.J. — General Optronics Corp. has introduced two wideband analog fiber-optic transmission systems said to feature bandwidths of over 250 MHz with distortion of less than .1% over the entire bandwidth.

Models Laserlink 8000 and Laserlink 13000 are said to offer fiber-optic analog distribution requiring low noise and low distortion, Laser performance is optimized by a peak limit circuit, a vendor spokesman said. Laserlink 8000 is available for $5,500 and Laserlink 13000 for $10,500.

The vendor also introduced a series of passive optical couplers using single-mode fibers with excess loss below 2 db. Models GO-SMC8 and GO-SMC13 are said to have several applications. The couplers have fiber leads of 1 meter in length and are housed in a rugged package for industrial use. Single-quantity price for each model is $1,250.

More information is available from General Optronics, 2 Olsen Ave., Edison, N.J. 08820.

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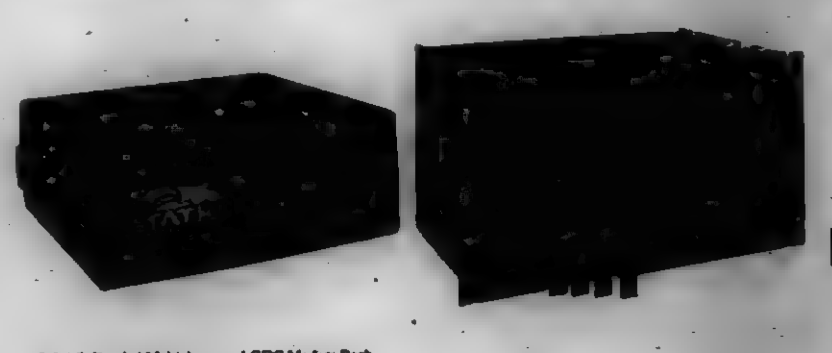

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Charlotte (704) 523-6685
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Tape System Boasts Error-Free Transmission

HOUSTON — Comspec, Inc. has unveiled a microprocessor-controlled tape system said to provide fast, error-free, tape-to-tape data transmission.

Tapetran reportedly transmits virtually any type of field-acquired data to a central processing site. It does not require private-line dedicated service for international communications and handles facsimile, print, plots, processed seismic, management reports and electronic mail.

The Tapetran facsimile interface feature is compatible for CCITT Group III digital facsimile units, the vendor said. A Tapeplot feature accepts standard plot tape and plots the data. Also, Tapetran systems are operational on UHF/VHF radio, microwave, Intelsat, Marisat/Inmarsat, Oil Sat and domestic and international telephone links.

The 8½-in., single-density system runs at 800 bit/in. and has a base price of $21,400. It is also available in 7-, 8- and 10½-in. single- and double-density versions. The Tapetran interface costs $2,000 and the Tapeplot feature costs $5,000. Comspec is located at Suite 275, 10,000 Old Katy Road, Houston, Texas 77055.

Four Procedures Target Tandem

BOULDER, Colo. — American Research Corp. has added four data analysis procedures and a file interface program to its version of the SPSS Data Analysis System software for use on computers manufactured by Tandem Computers, Inc.

The four procedures — Logit Model, Cox Model, Cox Time and Kaplan Meier — are said to enhance the data analyzer for applications in finance, banking, manufacturing and marketing, a vendor spokesman said. Applications include life cycles, product and process life expectancies, risk and hazard analysis and the calculation of survival rates, a vendor spokesman said.

The package is available for an initial license fee of $20,000 from American Research Corp., 4465 Grinnel Ave., Boulder, Colo. 80303.

Xyplex Offers Systems Tool

HARVARD, Mass. — Xyplex, Inc. has introduced a systems management package for its terminal switch and front-end system. The package includes an integrated front-end processing feature for the Digital Equipment Corp. PDP and VAX families of minicomputers that removes the terminal character processing from the host computer.

The Xyplex System provides terminal switching and port-selection capability within a building or campus over a local-area network. The package also allows the user to examine and control any of the components of the system, including the eight-line cluster controller and the host interface unit.

The package is available for a one-time license fee $1,600 to $2,400, depending on configuration. More information is available from Xyplex, Inc., Oak Hill Road, Harvard, Mass. 01451.

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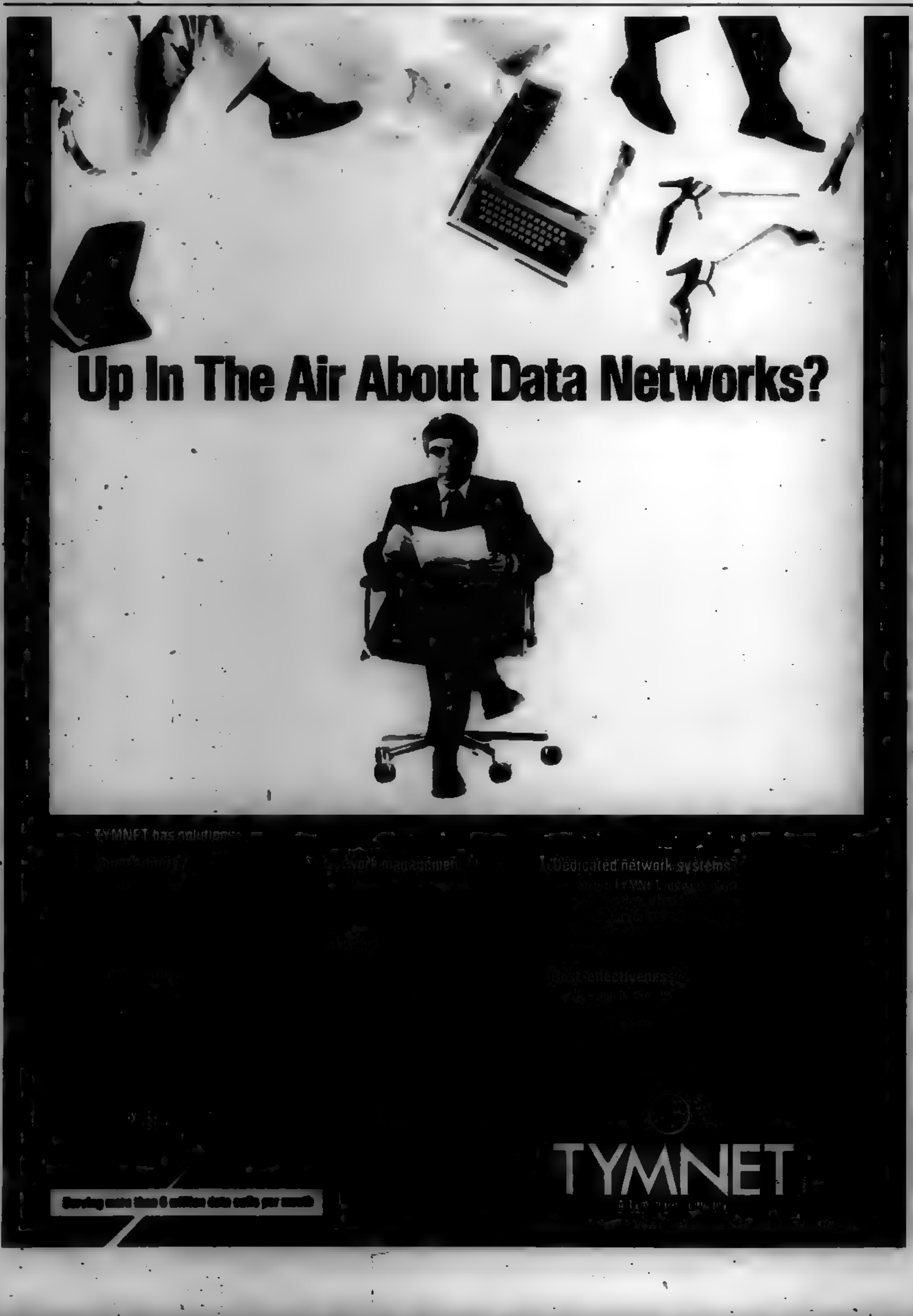

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Digital In-Line Scrambler Out

GREENSBURG, Pa. — Rotating Logic Systems has introduced a digital in-line scrambler designed for use in banks, financial institutions, hospitals, insurance offices or corporate facilities.

The IDS-250-S is sold in pairs, and each unit has a key code allowing for more than 20 million data scramble variations, a vendor spokesman said. It consists of an asynchronous serial descramble I/O channel and an asynchronous serial scramble I/O channel, a vendor spokesman said.

One set of data scramblers is available for $1,200 from Rotating Logic Systems, Highland and White St., Greensburg, Pa. 15601.

Split-Band Amplifier Bows

STATE COLLEGE, Pa. — C-Cor Electronics, Inc. has introduced a split-band amplifier designed for broadband local-area network data systems.

The LAN-100 series amplifiers provide for full-duplex data transmission over a 5-450 MHz bandwidth, the vendor spokesman said.

The LAN-100 single-quantity price is $700, available from C-Cor Electronics, 60 Decibel Road, State College, Pa. 16801.

Why Are Vendors Inking Pacts With PBX Firms?

(Continued from Page 65)

This raises the specter of IBM. Even the giant of Armonk, N.Y., has surrendered to the technology transfer tide, as evidenced by its agreement with Mitel, Inc. to develop jointly PBX technology. That decision was announced after IBM's "Carnation" PBX, marketed in Europe, was declared a dud by top IBM management. The industry leader also signed on with Texas Instruments, Inc. for work on very large-scale integration micro chips destined for local-area network use.

The posture of American Bell, Inc., the newly formed, fully owned and unregulated subsidiary of AT&T, also bears scrutiny. Finally freed of its corporate shackles, the company is expected to be a dynamic force in the marketplace. With its sprawling installed base of more than 40,000 Dimension PBXs and its recent introduction of the all-digital Dimension System 85, Baby Bell is a tempting target for terminal manufacturers and a fearsome competitor for other PBX vendors.

However, the company is showing no signs of opening up. To the contrary, it has introduced several proprietary Dimension-compatible terminal lines since its new-year inception.

And just where does all this PBX hoopla leave local-area networks such as Xerox Corp.'s Ethernet and its many derivatives? Most likely not in the position of being the dominant Fortune 500 automated office hub their manufacturers had hoped they would be. The recent acquisition of financially troubled Amdax Corp. by Ungermann-Bass, Inc. is telling testimony to that.

After a two-year battle fought largely in the pages of the trade press, it now appears that local nets will work with — rather than replace — PBXs. Their high-speed, high-bandwidth capacities make them ideal candidates for network gateways because of their ability to facilitate the heavy, bursty type of traffic involved in large data transfers.

The PBX has emerged in a position of strength largely because of its ability to utilize the sprawling installed base of twisted-pair wiring that is used for telephone communications nationwide. Although the coaxial cable used by local-area networks is relatively inexpensive, the process of rewiring an established building with it can be very costly.

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[1] *Datapro*: "User Ratings of Proprietary Software-COMPLETE" November 1982. [2] *Computerworld*: December 20, 1982.

From On-Screen Menu

Z-29 Terminal Unveiled

GLENVIEW, Ill. — Zenith Data Systems Corp. has introduced a CRT terminal designed for operation from an on-screen menu.

The Z-29 terminal allows for a user-defined parameter setting to meet desired specifications such as even/odd parity, bit/sec rates and handshaking. This is said to be accomplished on the keyboard rather than by the more common method of internal switches, a vendor spokesman said.

The terminal also features a detachable keyboard, a monochrome monitor and compatibility with Ansi protocol units and the Digital Equipment Corp. VT 52. On-screen editing includes character or line insertion and deletion, erase functions, tab sets and protected fields.

The Z-29 is available for $849 from Zenith Data Systems, 1000 Milwaukee Ave., Glenview, Ill. 60025.

Receiver Program Introduced

INDIANAPOLIS — Dataflow Systems, Inc. has introduced a transmission receiver program said to read streams of data from a hand-held Telxon Corp. data entry terminal via communications lines and record the data on disk.

The Terminal Entry Liaison/3000 (TEL/3000) program for the Hewlett-Packard Co. HP 3000 computer is said to perform the following functions related to hand-held data entry terminal transmission: auto answer, batch or message file output to disk, control record, parity checking, error substituting, hang up, message logging and other features.

TEL/3000 is available for a one-time license fee of $3,500.

Dataflow Systems is located at 5302 E. Victory Drive, Indianapolis, Ind. 46203.

EX100 System Enhanced With Info Processing, RS-232

SOMERVILLE, N.J. — Olympia USA, Inc. has announced two enhancements to its EX100 word processing system — an information processing capability and RS-232-compatibility.

The EX100 is a 64K-byte display-based word processing unit that employs an electronic office typewriter as keyboard and printer. The first enhancement is Multiplan, a financial spreadsheet program developed by Microsoft, Inc.

The RS-232 communications interface compatibility is said to expand the unit's versatility by making possible file exchanges from one EX100 to another, communications via phone lines or interfacing to other equipment.

EX100 costs $2,750 from the firm through Box 22, Somerville, N.J. 08876.

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TI Introduces CP502 Processor

AUSTIN, Texas — Texas Instruments, Inc. has introduced a communications processor said to support bit-oriented and character-oriented protocols at speeds up to 9,600 bit/sec.

The CP502 processor was designed for the TI Business Systems 600 and 800 computers and is equipped with both EIA and X.21 interfaces. The EIA interface provides full modem control and status capability for connection to leased-line or dial-up modems. The X.21 interface includes the necessary control and status capability for data circuit terminating equipment, a vendor spokesman said.

The processor is available for $800 from TI's Data Systems Group, P.O. Box 402430, H-644, Dallas, Texas 75240.

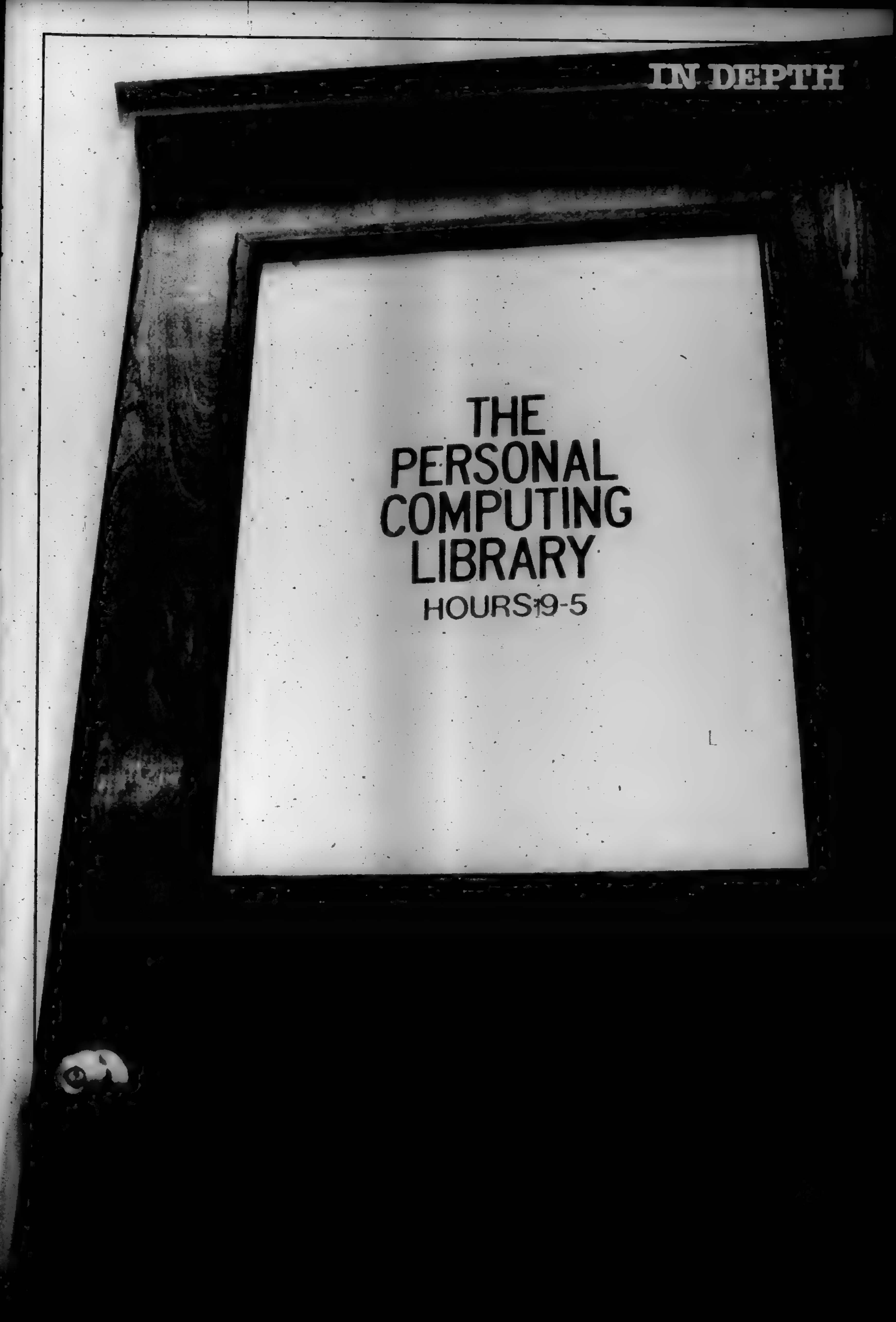
Visual 55 Offers Function Keys, Editing Tools

TEWKSBURY, Mass. — Visual Technology, Inc. has announced a terminal featuring Visual 210 and Hazeltine Corp. 1510 emulation capability.

The Visual 55 is said to offer 12 user-programmable nonvolatile function keys that can be dynamically allocated, extended editing with an insert/delete character and selectable scrolling regions.

The terminal costs $895, and quantity discounts are available from the vendor at 540 Main St., Tewksbury, Mass. 01876.

'No, Son . . . This Is a *Real* Football. You Don't Need Joysticks.'


THE
PERSONAL
COMPUTING
LIBRARY
HOURS 9-5

and access to data. This may require a change in the systems department's role.

Break With Tradition

Even in firms with in-house time-sharing systems and information centers, managers and professionals are told that they as users will be responsible for not only defining their information and programming requirements, but also for writing whatever report, model or analysis they need with the existing mainframe software tools and languages. Not surprisingly, these people are looking to personal computers as a more acceptable alternative. Microcomputers offer such advantages as easy-to-use software packages and tools, consistent user response times and constant availability. The user may see additional benefits of ownership, security and privacy.

But uncontrolled and unsupported use of different, incompatible personal computers leads to obvious problems. First, users will have to develop their own fragmented and possibly inconsistent data bases. Second, incompatible personal computers and data files will hinder the formation of integrated office information systems.

In addition, users may duplicate one another's efforts and data as they do their own evaluations, select hardware and software, create their own programs and build their own data bases. On the other hand, new users will not be as knowledgeable as the early innovators and will require more assistance. If buying is not coordinated, the company may also miss opportunities to take advantage of quantity discount agreements with manufacturers.

The possibility that unskilled users may construct faulty business models or programs cannot be overlooked. These faulty models may gain credibility and acceptance because they are computer-generated, but they can lead to erroneous business decisions.

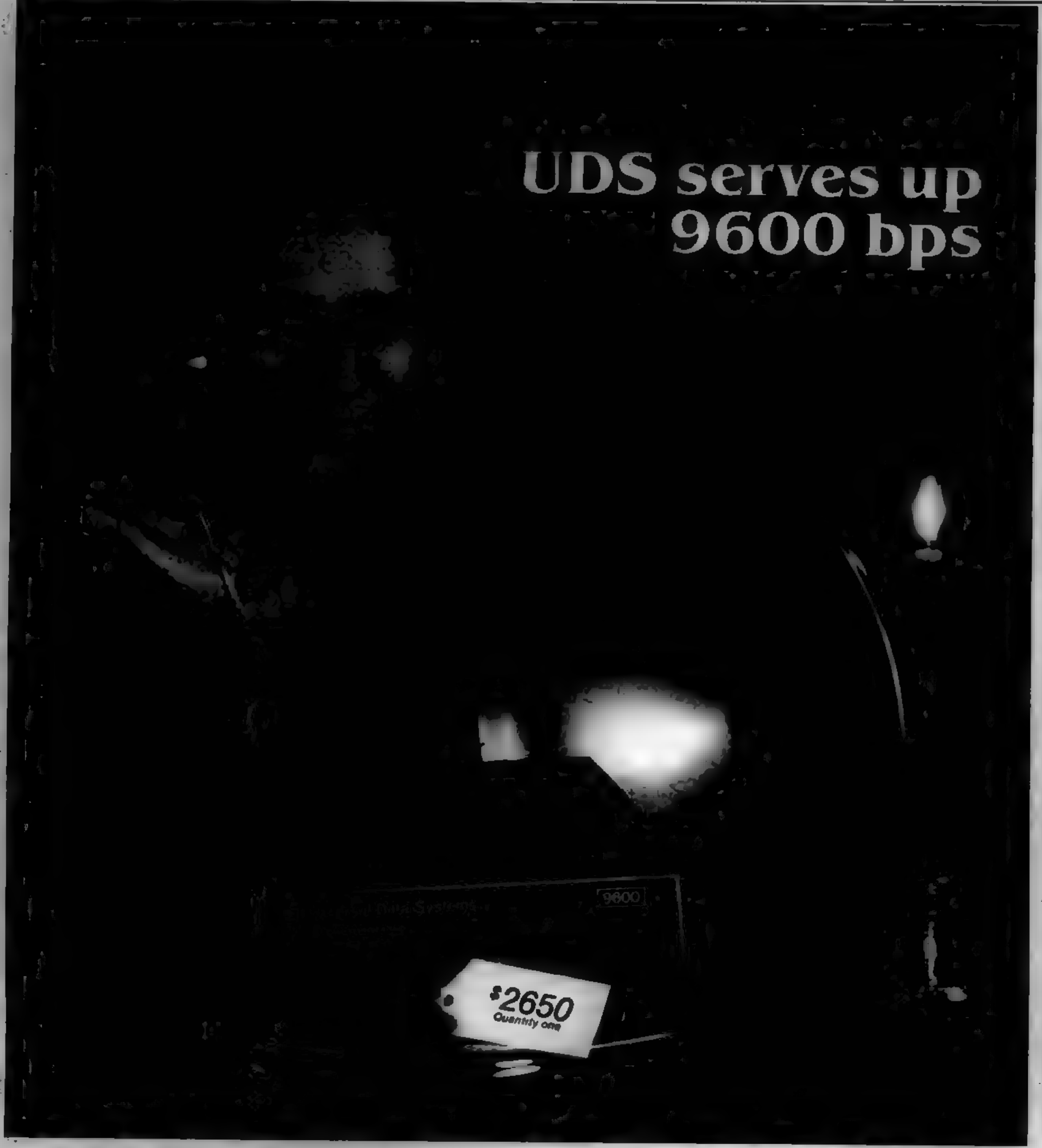
Extended Benefits

Despite these problems with personal computer use, most companies are not trying to stop their spread. Most companies see personal computers as a way to extend the benefit and power of their investment in central computer systems, software programs and corporate data to improve managerial effectiveness.

Information systems managers see personal computers as a way to reduce requests from users, which would otherwise be added to the applications backlog.

The use of personal computers serves another important, but less widely recognized role in an organization — that of teaching professionals to use computing tools and techniques as part of their job.

To realize the benefits of personal computers while reducing the potential risks, a company can take several steps. One of the first is to establish within the systems department a personal computing library to support the users. The library group has two functions. First, it pro-



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vides information and assistance in selecting, buying and using personal computer hardware and software.

The second function is to act as a data distribution center. By providing the personal computer user with valuable services, software tools and access to corporate data, the library can provide leadership in the use of personal computers, establish standards and take a long-term view of the company's business needs, as opposed to immediate, individual computing needs. The use of personal computers, therefore, will be controlled by the support the information systems group provides. The more support that is provided, the more control the group has.

In carrying out the first function of assisting in the selection and use of personal computers, the library can establish a personal computing learning center. The center can sponsor seminars and training sessions on such topics as available hardware and software and personal computer use. It can coordinate purchases to take advantage of quantity discount agreements with manufacturers and to limit the number of different computers requiring support.

The learning center should have personal computers available for demonstrations, training and lending. For users who are looking for advice on what software packages to use, the library may be able to recommend certain packages and allow the user to try the software on a demonstration computer.

It may also be possible for the group to download new or updated software to personal computer users. This would reduce a major problem in keeping a large number of users' software programs current without having to distribute a floppy disk to each user. For users who have a hard disk system, this would eliminate the extra procedure of manually loading the new floppy disk software onto the hard disk.

While existing personal computer software packages may be sufficient for most users, some may need custom programming. Some firms will not want their nonprogrammers trying to write programs for their personal computers, especially if the programs are used to advise customers or to prepare reports for regulatory agencies, or if the programs affect financial records. These firms may have the personal computer group write these programs on a central development system to take advantage of the programming aids available on a larger computer and also to maintain documentation and control over the programs.

Several companies have already taken this first step to support the personal computer user. One large bank in the Northeast established a learning center that was initially staffed with part-time volunteers from the information systems group. Within a few months, more than 200 people had received training from the center. This bank has several brands of personal computers available for use in the center and for temporary use outside.

A major insurance company has taken a further step with its learning center by making personal computers available for executives to take home for practice before they use them at the office.

For those companies that want the personal computer users to write their own programs, there is a need for protection from amateur software in critical areas. An additional role of the personal computer group may be to review, document and store important user-developed programs.

Internal auditors should periodically review personal computing models and programs that are used in sensitive functions. These reviews should determine whether additional measures are needed to control the quality of software. Managers who use the results of these models should be aware of the assumptions used in personal computing models, as well as the probability of errors in program logic, before making decisions based on the models.

Data Distribution Center

The personal computer library may also distribute data from the corporate data bases to the personal computer users. One of the first obstacles serious users may encounter is restrictions on the availability of

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But what's nicer is, the Xerox 2700 is very small. And very quiet. So you can place it exactly where it's most convenient for the people who need it.

Terrific, you may be thinking, but what does this amazingly flexible, high-quality electronic printer cost?

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The Xerox 2700 supports most systems that utilize Centronics 100, Dataproducts 2260 parallel interfaces and IBM bisynchronous interface protocol (2770/2780/3780).

data. Typically, the data a user or his department has supplied to the system is not available to him in a readily usable format. As a result, much of the data must be manually entered and the data may be inconsistent with other corporate data.

Shouldn't the financial analyst be able to access all his cost center report data on his own computer? This data could be as simple as the current month's cost center reports or as complex as the last 12 months' actual data, budget data for each month and last year's actual data by month. Shouldn't a cost center manager be able to extract required salary planning information from corporate files and apply the data to a salary planning package supplied by the corporation?

As noted by Robert Rosenberger ["The Information Center," Guide 51 Proceedings, Guide International Corp., November 1980], the file design and organization of operational data bases are highly structured for transaction updating, while end users need to query data files with little knowledge of even the logical structure of the query file.

One approach to this problem is to have the users define their requirements for periodic information. This information would be extracted on a regular basis from corporate and potentially public data bases and then reorganized on an interactive computer system to optimize for queries. Users with personal computers can have the data electronically distributed to them.

This procedure eliminates the time-consuming, error-prone manual entry of data. It also assures consistency of data, because the data being used by the user agrees with the corporate data. Consistency and accuracy, however, may not be that important to managers who would rather have rough estimates immediately than 100% accurate dafa one month later. Flash reports are examples of this trade-off between accuracy and timeliness: Business managers "flash" estimates of their financial performance when corporate management cannot wait for the official numbers. These flash reports are typically gathered and presented outside the normal DP cycle — that is, manually.

For decentralized organizations, the data distribution center can also be distributed to smaller scale, interactive computers at remote sites using common data dictionaries and network communications. By using distributed systems, a remote distribution center can avoid the need for a special computer room and support personnel, because these systems can operate unattended in an office environment.

Companies considering a data distribution center should investigate videotex technology as a way to organize and distribute efficiently large amounts of information. Videotex is more widely known in Europe for its use in external information and service networks that can be easily used by nontechnical users. The same advantages of extreme ease of use and high computer resource efficiency can also be achieved in an internal information network [Rembert Aranda, "The Home Office, Videotex and Personal Computers for Office Automation," *Telecommunications*, September 1981].

A more traditional DP approach to electronically distributing data to personal computers is to create a common data dictionary and file structure between the data distribution system that contains the extracted corporate data and the personal computer that will receive the data. Data can even be downloaded automatically at night if the personal computer has the ability to answer a dial-up line.

This important capability benefits the company by buffering the production systems from unplanned and uncontrolled demands that degrade performance. The benefits of this service to the users, though, may be a prime reason why users will agree to use the company-approved personal computer.

Both technologies provide an additional benefit by enabling the data distribution center to communicate to users any changes or revisions made to corporate data, thereby ensuring consistency. The need for multiple extract runs can be kept to a

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IN DEPTH

minimum by combining all the requests for data. Over time, as the extracted data files become larger and more inclusive, it may be possible to handle the ad hoc information needs of users from the data already extracted.

Another reason users may want to use company-approved personal computers is that they will want to communicate with their peers, secretaries and managers. A personal computer user should consider how his unit will fit into the company's overall networking strategy. It will be the library's challenge to evaluate computers on their ability to grow as the needs of the company expand beyond stand-alone personal computing.

Evaluating Personal Computers

Some of the attributes of a company-standard personal computer are related to the power of its operating system. The operating system must be capable of supporting the users' needs in the near term for such functions as graphics, networked communications and data management.

These functions require an operating system that can support large amounts of main memory and disk storage. The operating system must also be able to do more than one function at a time to be acceptable to professionals who do not want to wait for the computer to complete one function, such as printing a report, before they can perform another function such as reading or writing another report.

The operating system should have upward compatibility with a larger development system to facilitate central program development, maintenance and distribution. To facilitate data management and data compatibility between independently written programs, there should be a common, high-level file structure that can accommodate the various information needs of the users.

Above all, the operating system with all its power should not be visible to the nonprogramming user. The user should be able to access the system through standard or customized menus, rather than a system command language that he must learn. The objective should be to keep the user's barriers as low as possible.

The availability of third-party application software should also be considered in selecting a company personal computer. Third-party software may be either specifically written for a vendor's operating system or the vendor may provide a compatibility feature that allows software written for certain popular operating systems to be executed on the vendor's system.

Manager's Role

The role of the information systems manager seems to continue to change as each new wave of technology emerges. Yet in a larger sense, the information systems manager's role remains constant — that is, to manage the introduction of information processing technology in his organization.

In the '60s, he did it by controlling the mainframe; in the '70s, he did it by controlling the data. In the '80s, however, he will be judged by how well his company uses information technology. The information systems manager's focus shifted from hardware in the '60s, to data in the '70s, to the users in the '80s.

The personal computer is a major step in making information technology usable throughout an organization. The question, then, should not be how to control personal computers, but how to provide the leadership and service the users will require to take advantage of new technology. Establishing the library is an important first step.

About the Author

Donald B. Holden is responsible for software services industry marketing programs at Digital Equipment Corp. in Stow, Mass. He was previously involved with marketing programs related to DEC's personal computer products.

Before joining DEC, Holden was director of operations research for the Bank of New England, where he was responsible for an in-house decision support system.

He holds an MBA from the Wharton School at the University of Pennsylvania.

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STRATUS VS. TANDEM

(Or how the hardware fault tolerant solution supersedes the software based solution.)

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>
> *You can build a double computer inside one box for less dollars, as opposed to doing it in software, which continually needs maintenance and revision, as well as improvement."*
>
> by Aaron Goldberg
> of IDC which
> appeared in *Computerworld's*
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Now that the computer age is in full stride, 100% availability is fast changing from a luxury to a necessity. Downtime and its costs are unacceptable, especially when there is an alternative. Now that fault tolerant operation is becoming a universal requirement, there is demand for an improvement over the software approach used by Tandem. These computers must provide better performance, be easier to use, be easier to program and re-program, be less complicated and less expensive. We believe that the Stratus hardware based fault tolerant system answers these demands. Let us explain.

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The crux of the problem with software based systems is that they require complex, performance stealing software to provide fault tolerant operation. This software robs the system of precious resources because it uses processing cycles to pass status and checkpoint information back and forth between two computers. What's more, this passing of information can occur at four levels: operating system, user program, file management, and terminal control.

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STRATUS/32 – SYSTEM HIGHLIGHTS

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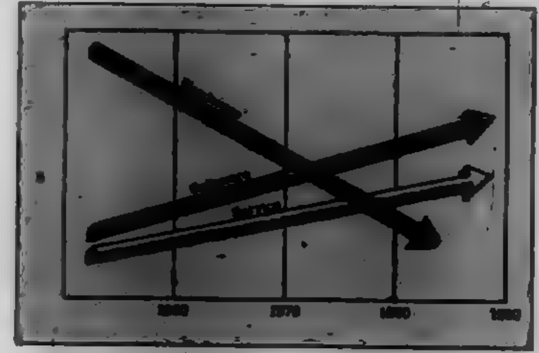
2. A design without performance penalties for fault tolerant operation – NO CHECKPOINTING!
3. A computer that pinpoints and isolates its failures, so repair is made quickly and inexpensively.
4. A system that can expand to 32 Fault Tolerant Processing Modules under a "single system image."



While software costs will rise because they are people dependent, experts agree that hardware costs will continue to fall.

Why Stratus is easier to implement.

The Stratus designer and programmer might as well be dealing with a conventional computer; one of them, not two.

Programmers are in a familiar environment. By providing industry standard languages, applications can be moved over without redesign or major reprogramming. Fault tolerant operation is a bonus, not a complex effort.

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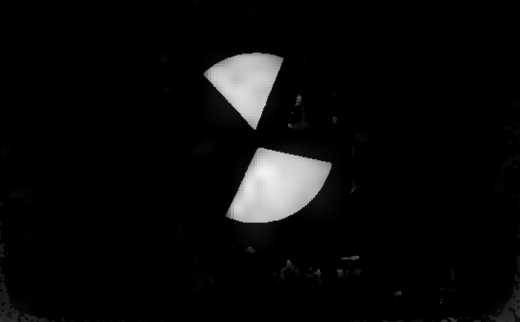

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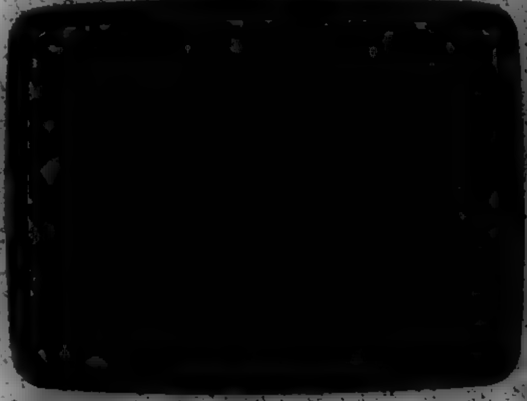

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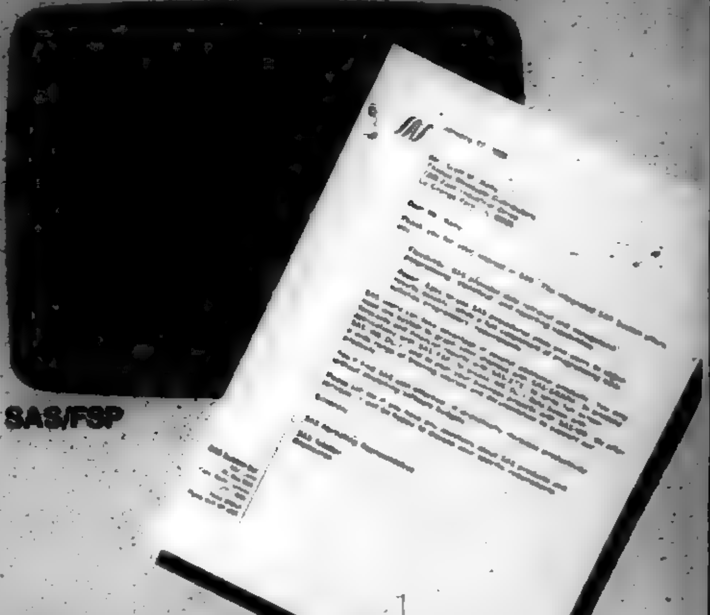

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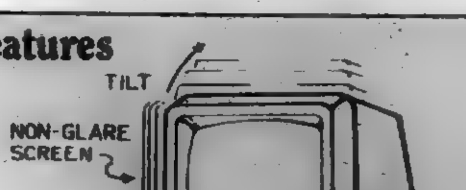

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DP Resource Planning

How To Get There From Here

By Robert E. Umbaugh

Resource planning for data processing is becoming increasingly complex with the growth of on-line systems, time-sharing, communicating office systems, data communications networks and hardware and software options. Long-range planning is never easy, and it is especially difficult for rapidly evolving technologies. Nevertheless, a comprehensive resource plan is vital for continuous DP service.

Traditional hardware resource planning using trend projections was generally a step function — that is, machine installation was planned and executed in single steps with lengthy intervening periods. Batch applications constituted most of the work load and increased as a function of the growth rate of the organization; the estimated impact of new applications was factored into the projections.

Because scheduling for use of these resources was completely managed by the DP department, there were relatively few surprises. Furthermore, because the installation of a major piece of hardware occurred rather infrequently, there was ample time for installation planning.

Although reliability was important in this batch environment, short interruptions were not nearly as disruptive as they are today, because the processing environment is much different. A number of studies report an average 40% compounded annual growth in CPU demand and an average 40% to 45% compounded annual growth in direct-access storage device (Dasd) requirements in major DP shops.

The general impact of such growth on cost, floor space, configuration management and power and cooling requirements is clear, but how this growth will specifically affect each one of these areas is

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not clear and requires a good deal of planning.

Card Playing

Resource planning requirements for hardware and network components can be collected and analyzed using the "Card" system: contingency, availability, reliability and demand.

Contingency. Contingency planning — preparing for the unexpected — is often the last consideration, yet it should actually be addressed during the early phases of resource planning so that decisions regarding contingency allotment can be used later as guidelines. Contingency can be addressed by establishing capacity corridors or reserve margin. Reserve margin is unapplied, but available resources that are assigned to satisfy unexpected demand. Such resources may be discussed in physical terms (for example, four Dasd set aside for contingency) or stated as a percentage or range of percentages (for example, CPU capacity will be projected load plus 18% ± 3%).

Availability and reliability. Availability, the ability of the system to satisfy the demands placed on it by the user, and reliability, the percentage of uptime of any individual component of a system (including software), should be addressed separately in a resource plan. A redundant configuration could conceivably offer 100% availability for a given period, whereas the reliability of an individual component — for example, a CPU — might only be 97%.

Demand. Demand systems (on-line, time-sharing, text retrieval and office systems), which permit users to place demands on resources at will, create a new set of problems. Dasd requirements are usually underestimated, networking is complex and costly and reliability and security are more important. The demand on the system as a whole and on its various components is difficult to project, and the scheduling of DP resources is no longer under the direct control of the DP manager.

Demand systems are usually most heavily used during the prime shift — the period when most office and line workers are at their jobs, between 7 a.m. and 5 p.m. The demand placed on the system during this period typically forms a spike — or peak — on a graph and is referred to as peak load. Identifying and projecting demand and controlling peak load are the primary tasks in DP resource management.

Load Duration Analysis

An initial analysis of the processing load imposed on the computer center provides a processing profile that shows the load characteristics for that particular center. The typical processing profile for a center with a number of on-line systems is a general graph of load and time, where load is calibrated in CPU hours, transactions or whatever measurement best fits the situation. To be more useful, however, both load and time must be broken down specifically.

One method of capacity planning divides the processing day into time zones and superimposes work-load categories on them (see Figure 1). Use of daily time zones for capacity planning will help the manager avoid the trap of using "average" daily load figures.

Viewing the work load in time zones also enables the manager to identify the source and size of peak loads.

Certain assumptions must be made when resource usage is planned. It is impractical to expect 100% use of any device's total capacity; therefore, reasonable ranges of performance and capacity corridors need to be determined for each group of devices in order to plan for resource additions. The capacity corridor is established by plotting optimal capacity and a reasonable estimate of practical capacity. For example, for a CPU scheduled to be available 24 hours a day for 22 working days a month, optimal capacity would be 100% of the total CPU hours, or 528 CPU hours. A more practical assumption, however, would estimate CPU operation at 85% of total capacity for the 22 working days, or 448 CPU hours. The capacity corridor for this CPU is then 448 to 528 CPU hours.

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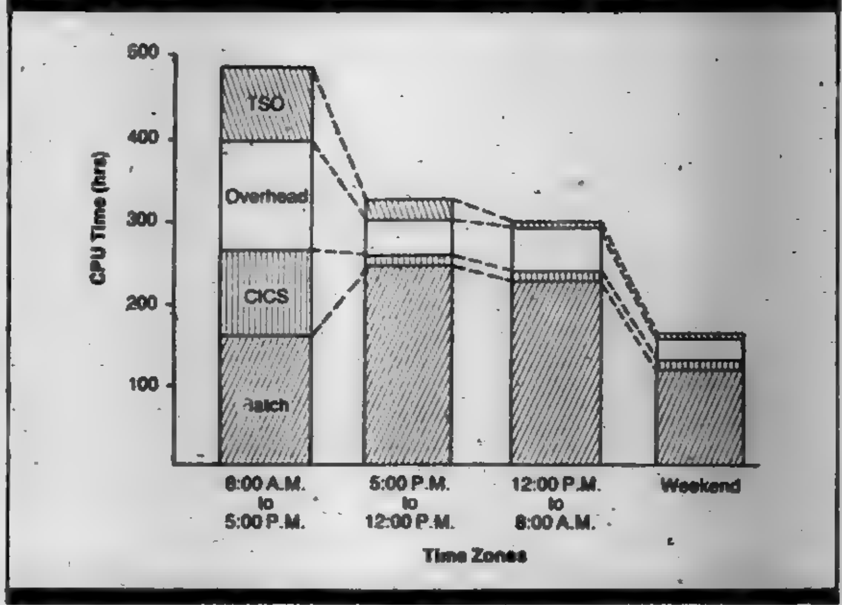

Figure 1. Demand by Time Zones

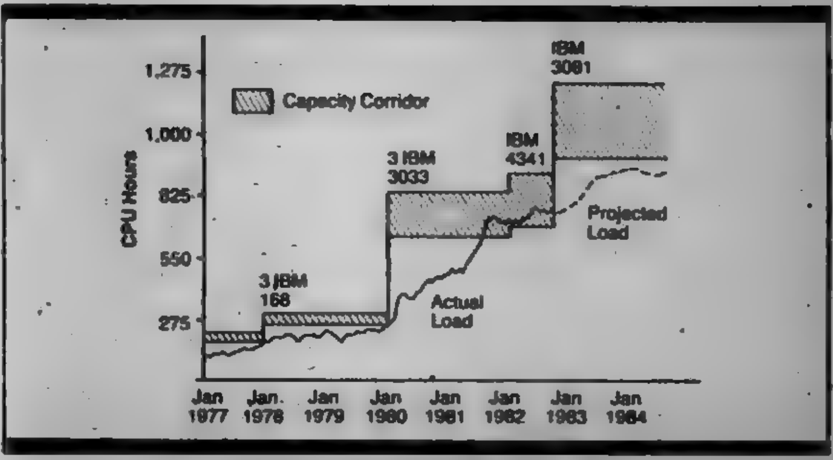

Figure 2. Prime-Shift Work Load

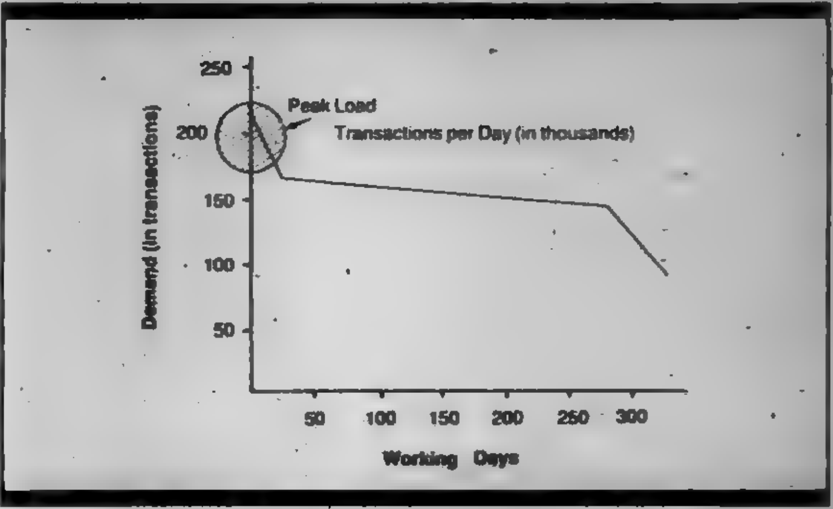

Figure 3. Daily Load Curve

Whenever projections of work load reach or enter the capacity corridor, the work load is processed "at risk," and some form of response is needed. The response must be decided on before it is actually necessary to take action — for example, projecting the need for a device must precede the real need for the device by the lead time necessary to obtain it. Figure 2 is an example of planning for prime-shift work load using capacity corridors. It is somewhat simplified, however, because actual load is shown as a total and does not reflect its components. As increments of capacity are added, the capacity corridor rises correspondingly.

In June 1981, the installation needed additional capacity. Some additional capacity was added in January 1982, but part of the work load continued to be processed at risk within the capacity corridor. As could have been predicted, operating within the corridor resulted in reduced service levels.

In summary, capacity corridors can help:

- Establish reasonable operating levels for various hardare components, especially CPUs.
- Forecast needed increments of processing power.
- Determine the point at which part of the work load will be at risk and service levels will deteriorate.
- Demonstrate to upper levels of management the need for a reserve margin.

Reserve Margin

In order to achieve a reasonable level of reliability, fall-back computing capacity — or reserve margin — is needed. Traditionally, the level of reserve margin was set by rule of thumb. As data processing applications increased and the work load grew more complex, however, reserve margin became essential and, for large installations, quite costly. The term reserve margin is probably better than "excess capacity," which incorrectly implies that the equipment is, for the most part, unused.

J.F. Chilcott, in a paper presented at the 1981 Japan, U.S., European Conference [1], outlined a method for matching supply with demand using reserve-margin computation. The initial step in establishing and justifying a reserve margin is the design of a load duration curve, which represents the demand expected on every working day in a year, arranged so the days with the highest demand fall to the left and those with the lowest fall to the right (see Figure 3).

It is also necessary to know the extent to which the peak hour within a day exceeds the average hourly traffic during the entire working day. The load will have a number of different components, depending on the installation, as illustrated in Figure 4.

In addition to different ratios of peak to average demand, the applications have different availability priorities. For a customer service system that supports direct interface with the customer (for example, an airline reservation system), availability is imperative, whereas it carries a much lower priority for an on-line financial planning system that is only

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used internally. The load duration curve can be arranged with these components ranked so that the least sensitive to reduction in availability falls at the upper edge of the curve and the most sensitive forms the base load, which must be available consistently.

The basic criterion for matching computing supply against the demand in the curve is that supply must be able to meet the predicted peak-hour demand if all computing equipment is working properly and is loaded to a degree that results in a reasonable level of response time (for example, 70% processor loading, resulting in a 3- to 5-second response time).

Such assumptions, of course, are not immutable and should be periodically reviewed by senior management. In addition, it may not be essential to plan to meet the entire projected peak-hour load every day of the year: A plan might be designed to serve the peak hour traffic on all except three days of the year, for example, as shown in Figure 5.

Figure 6 illustrates what happens if one of the processors fails. The example assumes that the total computing power is provided through a multiprocessor installation. For a single-processor shop, there are no fall-back options; the only decision concerns the acceptable length of time for the single processor to be inoperable before other action is taken.

When one processor fails, some loss in processing capacity occurs. The size of the loss depends on machine configuration; the most straightforward case is illustrated here, but the method can be adapted to any other configuration. The shaded area in the illustration represents the transactions that cannot be carried out when one processor fails. A comparison with Figure 4 shows that the essential applications can be served, but the less crucial applications are interrupted.

Although breakdown itself is unpredictable, the expected loss or deferral of transaction processing ability can be predicted for a particular configuration of computing power. It must be determined whether this is the "right" level of processing loss that should be planned for. One way of determining this is to redraw the plan to reflect a larger, more powerful set of computers. The expected loss of transactions is then recalculated compared with the expected loss using the smaller processors.

Comparing the difference in lost transactions with the increased cost of the more powerful equipment provides an estimate of the cost per transaction "rescued" by availability of the greater processing resource.

Treating fall-back or reserve-margin analysis in this way provides a number of benefits:

- It addresses contingency planning as an integral part of demand/supply planning, rather than as an expensive afterthought.
- It allows everyone involved in the investment decision aspect of resource planning — from the computing service user to the financial analyst — to view the processing power available under both normal and contingency conditions in the same way.
- It requires explicit assignment of priorities to the various components of the computing load.
- It determines the ranking of applications and the ultimate level of computing power by measuring the value placed by users on a lost transaction in each of the applications.

It is important to remember that this planning approach does not make policy: It merely provides a framework for policy decisions. Senior management must define the policy that guides resource planning efforts.

Peak Load Management

In addition to assessing reserve-margin requirements, a number of steps can be taken to address the peak-load problem. Five of the more easily implemented techniques are time-of-day pricing, conservation, load shifting, peak shaving and port closure.

Time-of-day pricing. If users are charged directly for computing services, time-of-day pricing — charging more for transactions processed during peak-load times than at other times — can be a simple, but effec-

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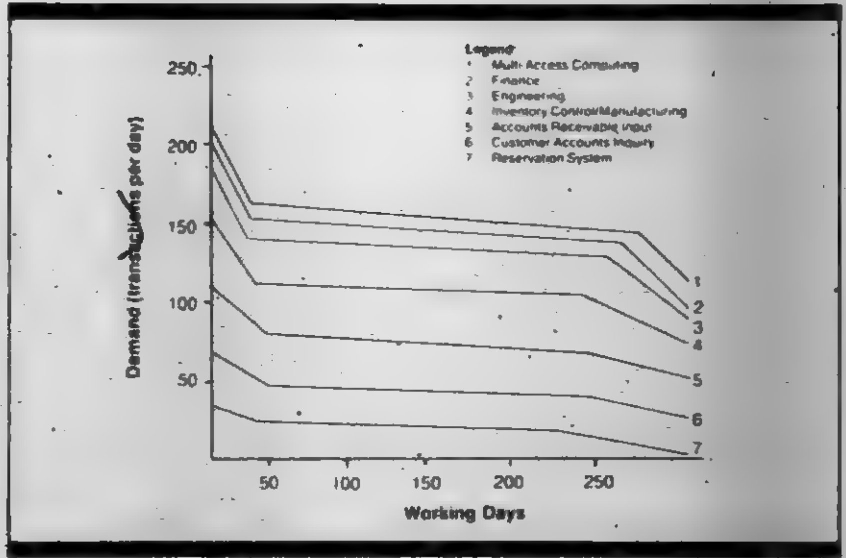

Figure 4. Load Curve Divided by Applications

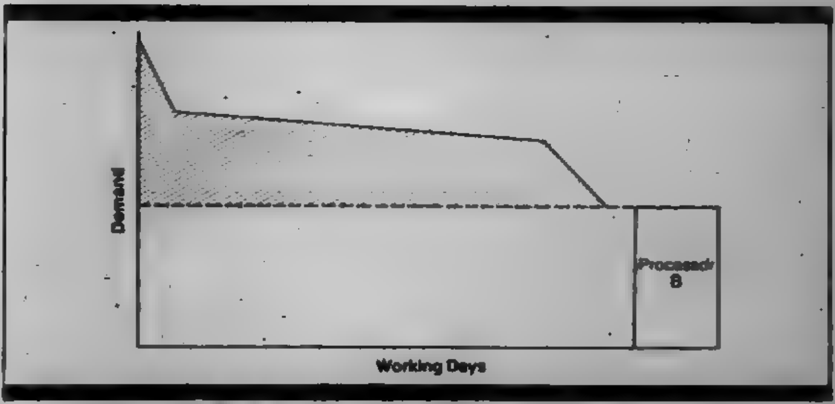

Figure 6. Projected Loss From Failure of One Processor

tive policy. The difference between rates must be substantial, however, to provide a real incentive for off-peak use. It is usually much more palatable to describe the difference in rates to users as a discount for off-peak use, rather than as a penalty for peak use. Thus, the DP department might advertise a normal charge of $400/hour and $100/hour for off-peak use.

Conservation. Just as employees are asked to turn out lights that are not necessary, they can be requested to avoid using computing resources they do not need. As with other conservation measures, however, compliance will vary among individuals.

Load shifting. Outside resources can be used temporarily to delay the installation of an increment of processing power. In highly integrated shops, however, this is sometimes very difficult.

Peak shaving. Although this technique can take several forms, all revolve around identifying those elements that make up the peak and "shaving" them off. Two methods for doing this are:

- Restricting the use of one or more high-resource-using, lower priority applications (for example, a financial modeling package) during peak hours.
- Shifting certain employees' work hours. If applications programmers are heavy users of time-sharing, their work hours can be changed to off-peak hours. Flexible work hours normally result in lowered peak load.

Port closure. In a heavy on-line environment with a large time-sharing load, one method of reducing peak load is to restrict the number of concurrent time-sharing users by restricting the number of ports open to the machine. Of course, this strategy may negatively affect productivity and result in some irate users.

Projecting Need

Projecting need is a critical part of the planning process and perhaps the most difficult estimation in planning for DP resources. Projections of future need are based on several sources, primarily the present processing load, which is used as a base and modified according to assumptions dictated by the business environment. An overall strategic plan for the entire organization — a corporate plan, for example — can be helpful when beginning a DP plan, but it is not absolutely essential.

Many organizations maintain sets of assumptions that are used for planning in other parts of the business (for example, financial planning predictions). Such assumptions may be continuous (a compound growth in sales of 5.3% is forecast for the next five years) or discrete (the company will acquire other companies during 1986 and 1988, adding a total of 200,000 customers to the existing customer base). Using these assumptions can help the DP manager project future work load.

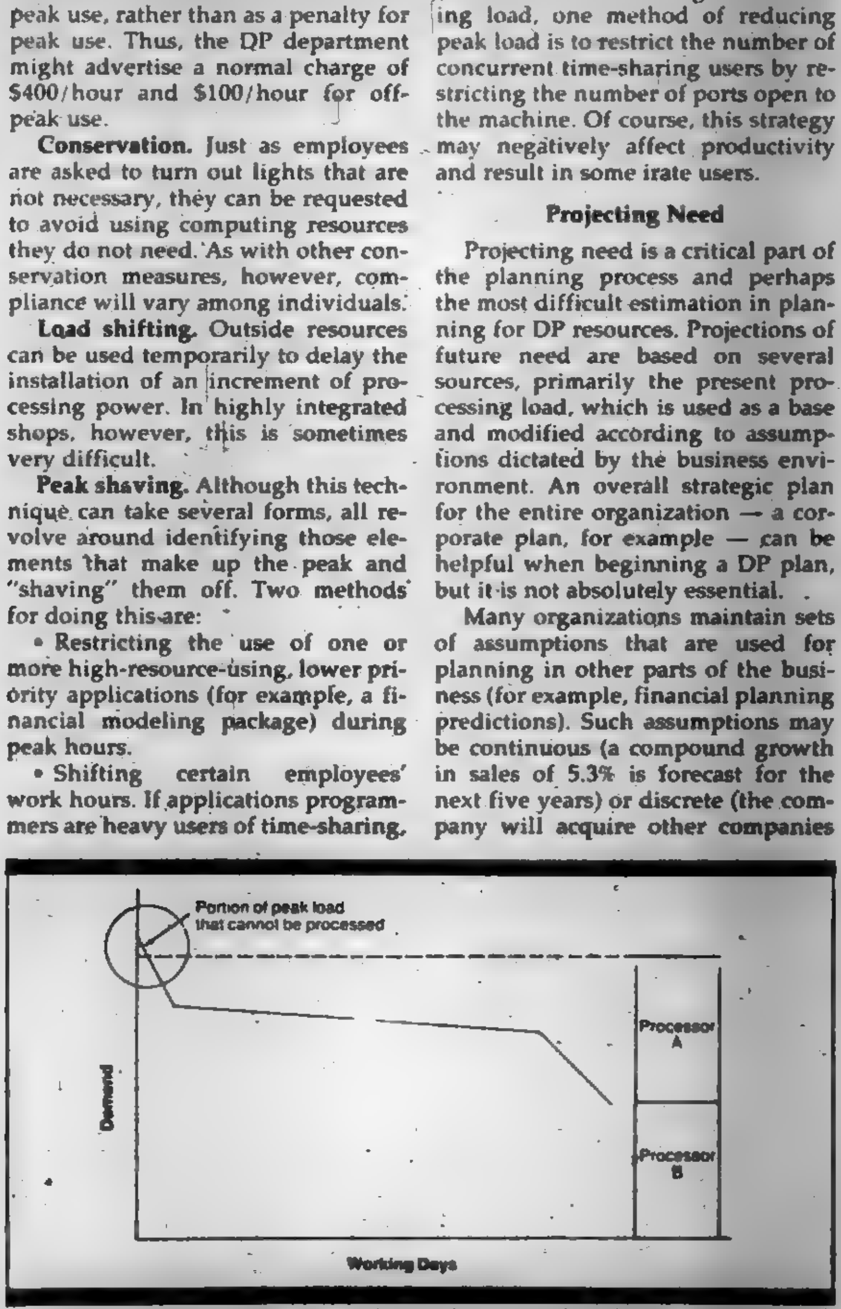

Figure 5. Plan for Meeting All But Three Days' Peak Requirements

Another source of projected need is the application resource plan, which should be at least as comprehensive as the hardware resource plan. See In Depth/16 for one method of projecting resource requirements for applications systems under development. The advantage of this method is that it requires project development personnel to schedule resource requirements for development, production and maintenance. These schedules must be recognized as educated projections that will change as user requirements become more clearly established. Using the projections of need submitted by applications development teams, the hardware resource planners can project demand and prepare plans accordingly.

IBM's *Business Systems Planning: Information Systems Planning Guide* [2] describes a more complex, two-phase

(Continued on In Depth/18)

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Getting the Most Out of Project Team Forecasts

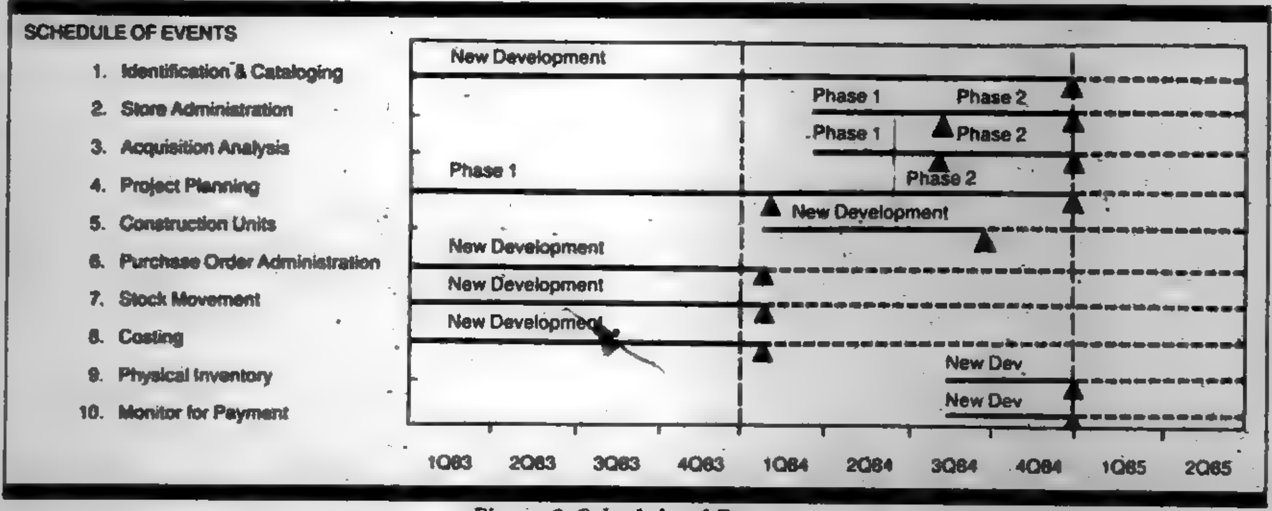

Figure 8. Schedule of Events

Obtaining reliable forecasts of resource requirements from systems development teams has always been a demanding task. One reason is that they often do not know what the user really needs, when the system will be implemented, how much CPU time will be needed to develop and test the system or how much work can be done during a CPU hour.

Because the project team may lack such information, wise resource planners will be skeptical of any projections. These projections must be considered, however, because the project team is the only source for forecasts of the impact of future systems. Because of long lead times for delivery of some types of hardware and for all types of facilities, resource planners need all the advance notice they can get.

Several methods can be used to improve the accuracy of applications development project team predictions. One is to educate the project teams in planning techniques, including assumption preparation and hardware capabilities. Another is to exercise intuitive, "gut-feel" planning: Many managers can produce excellent strategies using intuitive methods.

Recognizing the problems inherent in making resource projections based on systems development team forecasts, the resource planners can use the following method for gathering data for these forecasts. The process outlined here should be repeated regularly; every six months is a good interval.

Define the units. Figure 7 depicts a form that can be used to describe briefly the system and its subfunctions. This is useful for checking for redundant systems development efforts and for scheduling application implementation and hardware installation events.

Schedule of events. Figure 8 illustrates a sample schedule. The solid lines represent the development phase, triangles depict installation and start of production processing, and dotted lines represent regular maintenance during production status for each subfunction.

Resource requirements. Resource requirements should be stated in terms that are understandable to the development team and the planner. For example, the terms used in Figure 9 are CPU hours translated to percentage of an IBM 3033; gigabytes of direct-access storage and so on. "Not currently available" usually means that the system design has not progressed far enough for the team to even make a guess.

Integration with hardware plan. The results of the first three steps are first integrated into a subset of the hardware plan and later, when all application plans are complete, into the full hardware resource plan.

SYSTEM MMS—MATERIAL MANAGEMENT SYSTEM
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2	Store Administration	Establishes and maintains parameters that control the replenishment process
3	Acquisition Analysis	Processes responses to system-generated requests for procurement
4	Project Planning	Performs bill-of-material processing, maintains schedule, pending movement and material needs
5	Construction Units	Establishes and maintains construction assemblies
6	Purchase Order Administration	Establishes and maintains information for all types of purchase orders and releases
7	Stock Movement	Posts material movement between stores, back stock and open stock and in-and-out stock
8	Costing	Establishes and maintains standard costs
9	Physical Inventory	Posts inventory counts and reconciliation of variances
10	Monitor for Payment	Performs payment processing, including error recirculation

Note Three subfunctions not listed are System Control, Supplier Qualification and Receiving

Figure 7. System Description

	1Q83	2Q83	3Q83	4Q83	1Q84	2Q84	3Q84	4Q84	1Q85	2Q85
1. CPU (% of 3033) TSO	3.8	3.8	3.8	4.0	4.3	5.3	6.5	6.5	7.0	9.0
Online Production	1.2	1.2	1.2	1.5	1.6	2.0	2.5	3.0	3.5	4.0
Batch	5.0	5.0	5.0	5.5	6.0	6.5	7.0	8.0	9.0	10.0
2. DASD (Gigabytes)	5	5.8	6.5	7	7.5	8.5	10	11	12	18
3. Tape (No. of Mounts)	not currently available									
4. 3800 Printer (Lines Printed)	not currently available									
5. COM (Lines Printed)	not currently available									
6. Software (packages)	– PERT/CPM –			–	–	–	–	–	–	–

Figure 9. Resource Requirements

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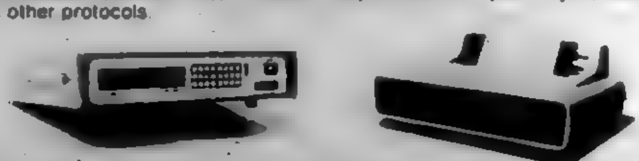

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Outline for a Resource Plan

I. Executive Summary
- A. Basic description of DP activities, purpose of plan.
- B. General assumptions regarding DP environment.
- C. Financial impact of plan, cost per year, cash flow requirements.
- D. Major hardware/software summary.

II. Strategy
- A. Milestone events.
- B. Planned activities.

III. Project Analysis
- A. Summary of each major system (using a form similar to Figures 7, 8 and 9).

IV. Demand System Impact
- A. Time-sharing.
- B. Graphics.
- C. Open shop use.

V. Equipment Plans
- A. CPU, memory, channels.
- B. Direct-access storage.
- C. Tape drives.
- D. On-line unit record, data entry.
- E. Off-line unit record, data entry.
- F. Communications devices.
- G. Satellite processors.

VI. Software Analysis (Operating System)
- A. Installed software categories (operating system, communications software, data base management software, productivity aids).
- B. Forecast software requirements for period of plan.
- C. Major software events (event chart).
- D. Software configuration chart.

VII. Data Communications Network
- A. Network configuration.
- B. Network events (chart).

VIII. Personnel Plan
- A. General staffing requirements.
- B. Training requirements.
- C. Recruiting requirements.
- D. Project staffing charts.

IX. Facilities
- A. Building modifications required.
- B. Space needs for projects.
- C. Facility event chart.

X. Other
- A. Word processing evaluation.
- B. Text-retrieval impact.

(Continued from In Depth/15)

approach to business systems planning. The first phase — identification of requirements — describes the relationships among the various elements of an information system network and is not limited to the computerized information system network.

The second phase — definition — documents a long-range applications development plan for the design and implementation of decision-oriented management information and control systems that use integrated data bases. The guide is comprehensive, including such elements as methodology descriptions, interview guides, end-product outlines, techniques used to gather requirements in various industries and examples of the benefits that can result from the use of this technique.

Latent Demand

Latent demand — the work load that would be processed if there were enough resources — is a well-known phenomenon to seasoned DP managers. Latent demand is the basis of two fundamental laws of data processing:

- Work load expands to fill existing capacity.
- There is never enough disk space.

Latent demand builds up during periods when DP resources are saturated and processing needs continue to grow. When new capacity becomes available, this demand is quickly imposed on the system.

Taking latent demand into consideration when projecting need is a necessary part of DP resource planning.

Planning Steps

Specific resource planning is necessarily more detailed than a long-range DP plan. Considering each specific event (like the installation of an additional string of disk drives or a major software package) and calculating the impact of that event on the surrounding resources result in better control of resources.

The formal resource plan sometimes omits systems software modifications. However, changes to operating system software and the installation of new systems software modules can seriously affect existing applications systems and can alter the processing efficiency of the installed hardware. Changes to the operating system should therefore be integrated with the formal resource plan.

Data communications network planning is also sometimes omitted from the formal resource plan. As the complexity of the network grows and as the relative costs of data communications rise, however, it becomes more critical to include this element in resource planning.

Maintaining an event chart for each class of resource will facilitate both planning and scheduling. Event charts should be prepared for installing CPUs, Dasd, tape drives, printers, purchased software and applications software developed in-house.

Far too many DP installations operate without a comprehensive resource plan. If an installation is to prosper, the DP manager should improve its resource planning skills. The outline in the box alongside is a guide to developing a resource plan and should be adapted to the needs of the organization.

Application project teams and operating system support teams should be included in the plan development. The plan should be kept current and reviewed regularly. The data processing steering committee can be involved in a higher level review of the resource plan.

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1. *Much of the material in this section is taken from "Matching Computing Demand and Supply," by J.F. Chilcott, director of management services, British Gas Corp. This paper was presented at the Jusec Conference, Rome, Italy, May 1981, and is used with permission of the author.*

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About the Author

Robert E. Umbaugh is a vice-president of Southern California Edison Co. in Rosemead, Calif., where he is head of all data processing activities. He has been with Edison for 10 years.

He is also the consulting editor for the Auerbach Data Processing Management information service.‡

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BY WILLIAM C. RAMSGARD

Documentation is a curse to organizations that keep everything and anything. But where should the systems department draw the line?

Many people start a new job by reading policy books, accounting manuals or texts from the last consultant's study. They can only go to work when the boss, or more likely the person who just left the job, explains how tasks are to be done. The new employee often has no written procedure to follow; or, if he has one, it is out of date.

In most departments at most organizations, there is little documentation to describe how to do the job. A few stable frameworks, such as the chart of accounts, bills of materials and manufacturing specifications, provide a thin veneer of consistency. But while they describe *what* can be done, they don't tell how.

In data processing, every reference work, training course and department manager says, "You document." This appears to mean that you collect almost every written scrap of paper related to the project and find some way to organize and save it. It means using a method of explanation so clear that a programmer or analyst who never before worked on this project can maintain it.

Finally, when the actual function changes (at 3 a.m. or three years from now), the programmer who changes the code will also be required to change accurately all the documentation before ever being allowed to work on any other job. This requirement forces all changes to be as clearly written as the original material. The documentation is then always a complete and accurate reflection of the process.

The problem with this requirement is that it is never met.

Our objective seems to be perfect documentation in data processing, while all other functions have none. Yet, the work between DP and any function is a partnership: A contract must be drawn. The beginning stages include objectives, letters of authorization, memos and many forms of political paperwork.

Once the project exists, and definitely when it is completed, this type of documentation has no value. In the political environment of your organization, you will find that no authorization will protect you if things go sour. Do not save this documentation. Do not expect to be able to hide behind it.

DP often lives by the senseless rule that any documentation is better than none. The term "documentation" includes every fact, every finding, almost every thought of alternatives, recommendations and observations. The problem is the most complete documentation packages take too long to compile and are seldom read.

The problem with documentation is that it is frozen in time. It is history. The real world changes and moves on — documentation does not.

New Systems

One of the early steps in any systems development project is to collect facts about the existing system. Interviews are conducted and forms and reports are collected. Sometimes, more enlightened investigators will verify the facts and broaden their personal understanding by actually observing the processes or by physically walking paperwork through the system.

The output of these early phases of investigation is some form of documentation. It may be a specific flowchart or it may be some type of narrative. Traditionally, the method of preparing documentation is highly dependent on the developer's orientation.

Three groups prepare documentation or specifications: programmer/analysts, users and systems analysts. Any one of the groups may select any method, yet each group has different goals as demonstrated by the choice of documentation tools and approaches.

Programmer/Analysts

The programmer/analyst's interests are directed toward optimum mechanized processing. This is the most difficult job. It requires translating human effort and understanding into electronically comprehensible code, which must be effective. Misspelled words or errors in punctuation can cause delay now or disaster later.

The cryptic shorthand of programmer/machine communication frequently carries over to the human documentation style. It might be expressed in any one of three major classifications: flowcharts, narrative and cryptic English.

Flowchart documentation. Some methods are complex and obscure. Whatever visual shorthand method is selected, it must be explained to the user community. Templates have more symbols than users need to understand. Programmer/analysts fail to appreciate that the user community often has no idea what the arrangements and symbols mean.

Diagramming complexity and strange syntax frighten the user. Coupling, cohesion, logical inversions, functional decomposition and

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many other methodology terms breed user confusion and mistrust. The programmer/analyst uses a background of DP work experience to dive immediately into detailed module design. The documentation can be detailed and correct, but communication with the user might be almost nonexistent.

Narrative. It is difficult to organize concepts and explain them clearly in paragraph form. However, eight or 80 pages describing how to process a new account will be boring and very possibly incomprehensible. Brevity and clarity are essential.

Cryptic English. Pseudocode or structured English can be difficult for the user to master.

Development by the User

After 25 years of technical development, data processing has discovered a missing link — the user. The entanglement of languages, packages and tools has been a floodtide toward complexity. The user was forgotten in the flurry.

Structured analysis and data base writers recognized the problem. No one in DP had the user's interest at heart. Rather than trying to turn DP personnel around, they universally have demanded user involvement in the process. They provide some tools: data flow diagramming, entity development, user views and so forth.

What is missing is any way to get scope. A user must limit his documentation to a specific area. By training and job inclination, the accountant, production control manager or engineer is seldom prepared to record the excruciating detail of even his own work process in order to support the equally demanding requirements of a computer system.

Untrained, the user will document with narrative. With training, a simple structured analysis approach using only one or two symbols may work well.

But the structure and data base people expect too much. The user has a job to perform. Like the analyst/programmer, the user representative is involved with an all-consuming functional orientation. The top-down functional decomposition approach is not possible. If the user contact is at the managerial level, the development specification will be broad and will omit the necessary detail to get the job done.

Furthermore, users have difficulty with abstractions of local views and entity development. They are at their best developing descriptions of the current physical process. It takes a trained systems analyst to find and suggest alternatives.

Development by Systems Analyst

Detail *and* big picture are the province of the systems analyst. He is the one person, except for an internal auditor, who can easily cross functional boundaries. He can examine details, functional efforts and organizational activity without the parochial viewpoint of a hardware/language/package configuration or the limited view of the functional manager.

The choice of tools may be just as obtuse as any the programmer/analyst uses. Preferably, the analyst, in full partnership with the user, can prepare specifications using structured analysis for understanding and mini specs for coding, which can be clear, complete and more.

The analysis passes beyond the scope of the functional manager's department. The specification should be a communication between the user and technical DP staff, yet both groups should be satisfied with this documentation.

Usable Documentation

The person or group documenting reflects a style, but the style does little to affect the accumulation of unneeded papers. Any information or system can be recorded, organized and prepared in formal reports and other structures. Most of the documentation is insurance paper for the highly political work of systems development. A truly usable documentation product appears in only two forms:

- Development specifications — which are to be eventually destroyed.
- Working procedures — the single documentation category of a successfully developed system that

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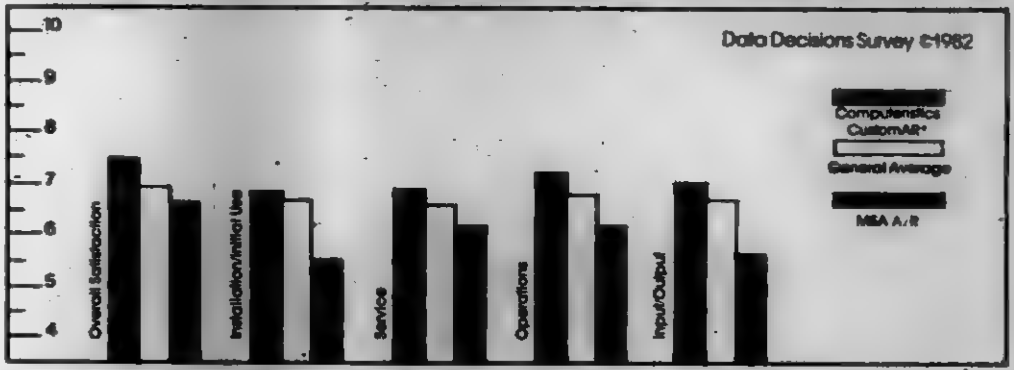

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needs to be retained.

A contract of understanding between DP and the user can be developed only if well-defined specifications are prepared. The existing system must be fully comprehended by both DP personnel and the management of the target business function. What exists then is the base from which improvements are created. Problems arise when mutual understanding does not develop.

The method of communication and documentation, except in the smallest systems, is by some written process which we will call "development specifications."

The dual understanding requirement of "what is" and "what will be" is often ignored. New systems are frequently designed without any investigation or comprehension of the existing system. By not first documenting that system and verifying it at both the managerial and clerical level, the designer can miss essential requirements. "What is" must usually be incorporated into "what will be."

The development specifications are directed toward the analysts, programmers, procedure writers and users who are about to combine resources in a new way to accomplish a task. A second iteration needs to contain only the final views of what will be. This development specification outlines the tasks that must be accomplished by machine or exacting human action. This documentation is the what and how of detail design in outline form.

Development Specification Life

What happens to the specification once it becomes a working set of programs and procedures? After all of the development work is complete, this mass of paperwork changes into documentation. It is generally organized into sections and filed in cabinets. Occasionally, it is microfilmed.

After a short period of time — a few cycles until all of the bugs are worked out — the documentation is no longer treated as reliable material because of possible changes to the system. We live in a blameless environment where functional managers react to situations in creative ways for the benefit of the organization. This causes change. Much is done, even without revising information processing programs. Where changes are made (traditional program maintenance), no one can ever be sure that the written documentation has also been updated. A short time span, therefore, drastically devalues the documentation.

So what should data processing do with all of the interview proceedings, meeting minutes, report layouts, source listings, test documentation and so forth? The answer may be shocking: Destroy them. The entire purpose of the development specification was to build an information system. Sources and object code and JCL are all in the computer room. Data definitions are recorded by the data base administrator or in the data dictionary. In a worst-case situation, there is a repository of current file layouts.

The specification has been implemented with detailed administrative procedures and exacting computer code. When change is required, the existing procedure and code must be amended. No part of the business world has ever done well at keeping a history of change up to date. Why should data processing be different? After the development specification has served its purpose, destroy it. After modification requirements have been instituted and accepted, trash the paperwork.

Do not save what you do not trust.

Working Procedures

The retainable form of documentation is only the material that is required, in its existing form, to get the job done. It is the detailed "how" of the function as it exists today.

By definition, many items created by the development specification have to be included in this category. Keep source code, object code and JCL. Procedures at any level including methods of dealing with exceptions, limits, handling and errors are also kept.

But much saved paperwork serves no purpose. Keypunch instructions may include a card layout. This is part of a working procedure; a report

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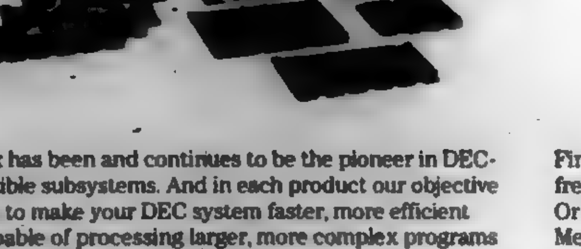

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layout is not. Once the process is running, you have the actual documents created by the system for a starting point to make changes. Old layouts filled with Xs and 9s, handwritten on a print layout form, are not worth saving. Destroy them.

The bonds of documentation are strong. To even suggest the destruction of all those beautiful top-down, hierarchical, structured, carefully organized documents is enough to force many computer science fanatics to turn over in their project management methodologies. Offices are constantly rearranged and production lines reorganized. It is also likely that the company internal telephone number list is constantly changing and way out of date.

We have blueprints for factory and office structures and data bases for the basic information processed over and over again. But specific business processes and office arrangements, like thinking, are extremely volatile. It helps to record what is happening now, because what happens tomorrow will be different. There is no payback in documenting for the purpose of maintaining a history. History, in the sense of business information processing, is a worthless ratification of times gone by.

Test yourself. Will you allow your people to redesign any of your systems based only on data available from the existing documentation? There is one exception, which will be discussed later. Otherwise, save and maintain the documents that tell how things work right now. Destroy the rest.

The procedures are sufficient to get the job done when:

- They explain briefly and accurately each human and machine activity.
- They provide for all possible variations you can think of now (but not forever).
- They contain enough comments in the program code portion so that a new hire with adequate technical experience can maintain the programs.

Warning: Working procedures do not belong in a book. Procedure manuals are wasteful collections of bureaucratic constraint. Everybody does not do everything, so why are complete procedure manuals passed out to everyone? A working procedure is a battered document used frequently by people who actively do the job.

Organizations should have the master procedures filed and working copies out on a distribution list to the group that works with them. Stop the wholesale distribution of any type of procedure.

Identify the Essentials

Documentation is a curse in most organizations. We mistakenly keep anything that is written down. Much of what is not necessary is created simply to observe internal standards.

Those pieces of the development specifications that are justifications, approvals or history should be destroyed. Keep as documentation only that part of the material that actually works in the processing cycle. This requires heavily commented programs and complete current procedures. Nothing else is necessary.

There is one test for good documentation. Bring in an outsider and let him follow the system. If it is clear to a stranger, it is well-documented. Remember, employee turnover is fast. Plan for it.

There is one exception to the working procedure rule. If you specify well (top-down with a very simple structured analysis and mini specs), the using function(s) may choose to retain the specs. For the very first time, they have a logical and clear explanation of how things work from general to specific.

If they save that document and train new people with it, you've done well.

About the Author

William C. Ramsgard is an associate senior systems analyst at Niagara Mohawk Power Corp. in Syracuse, N.Y. He provides technical training to personnel of the Management Systems and Services Department.

Before joining Niagara Mohawk in 1980, Ramsgard was an operations analyst for Agway, Inc. Prior to that, he was manager of factory and office systems and procedures for Crouse-Hinds, Inc.

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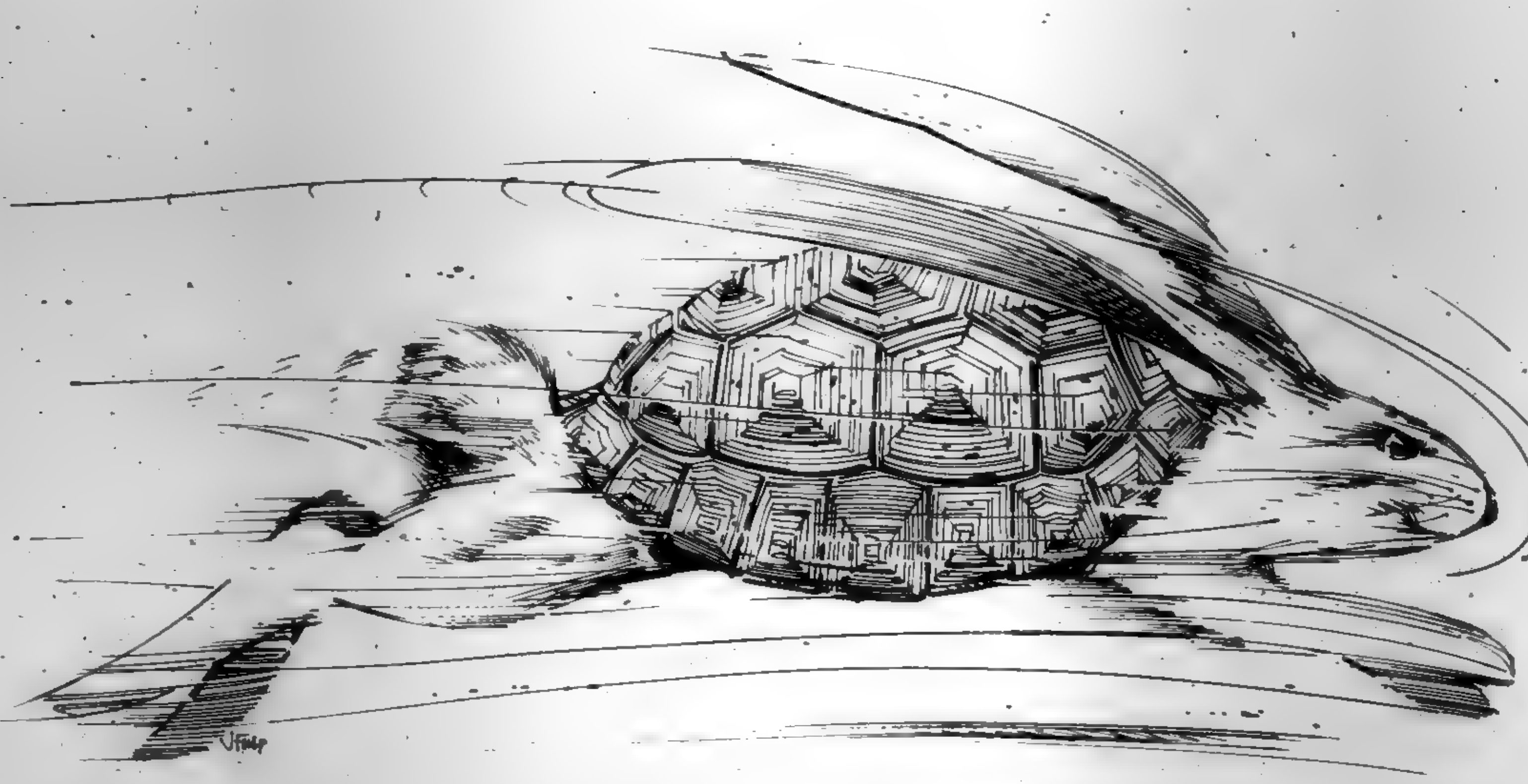

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Program Permits IBM 8100 Users To Trade for Syfa

BOULDER, Colo. — Computer Automation, Inc. has put together a trade-in program that will allow IBM 8100 users to trade their systems in for one of Computer Automation's Syfa systems.

According to the company, the program is directed at those 8100 users who have purchased "two or three" 8100s for program development and have "encountered significant or even insurmountable problems in applying the machines to specific applications."

Computer Automation President D.H. Methvin said the program was inspired by the Syfa systems' superior performance in benchmark tests against the 8100. Methvin said the tests reportedly showed the Syfa systems were easier to program and displayed greater power than the 8100s.

"We are really looking for the user who will start with a few systems, then wind up ordering 30, 40 or 50 more," Methvin explained. He added, however, that the company will not make a deal with someone "who has 50 of the 8100s and wants to swap for 30 Syfas." Methvin said terms for trade-in transactions will be worked out on an individual basis, but said, in some cases, "I could see where we would allow an 8100 purchaser to recover the full price of his IBM when he signs an order for our systems." The trade-in plan also does not apply to those 8100 users that lease their systems.

Computer Automation claims its Syfa series is best suited for large companies that have minicomputer-based networks with large, centrally located IBM mainframes. A spokesman said the Syfa systems communicate with IBM mainframes using IBM's Systems Network Architecture/Synchronous Data Link Control communications protocol.

Methvin said his firm is in the process of putting together several new small packaged Syfa systems specifically designed for networking applications. He said he expects the systems to be priced well below comparable IBM minicomputer-based systems.

More information can be obtained from the vendor at 4890 Sterling Drive, Boulder, Colo. 80301.

Lisp-Based Workstation Debuts From Symbolics

CHATSWORTH, Calif. — A supplier of artificial intelligence (AI) systems last week replaced its existing processor with a Lisp-based workstation that reportedly outperforms typical superminis by at least twofold, while costing an average of less than $100,000.

Symbolics, Inc. claims to have optimized its single-user Model 3600 to run very large programs characteristic of scientific, engineering and other highly technical applications.

Intended for processing symbols rather than numbers, the 36-bit system comes with a one million instructions per second (Mips) CPU that supports up to 34M bytes of main memory and 1.8G bytes of disk storage, a Symbolics spokesman said.

The 3600 also comes with an operating system written in Zetalisp, an enhanced version of Lisp, the AI community's preferred programming language. Lisp is optimized for applications requiring the reorganization or manipulation of data structures and thus allows users to solve complex computing problems that defy easy solution with any other language.

Together, the 3600's 1-Mips processor, large-storage capacity and Lisp-based software environment reportedly make the system suitable for computing-intensive applications such as computer-assisted language translation, training simulation, robotics, circuit design and program development. These and related applications typically involve massive programs that require huge volumes of computing power to execute — volumes that are usually associated only with mainframes.

To speed software development, the system includes incremental compilation and dynamic linking among its package of standard software features. Symbolics credits the two capabilities with shrinking the edit-compile-debug loop in large-program development to as little as 30 seconds. With a conventional minicomputer, by contrast, the edit-compile-debug cycle typically can take as long as an hour, the spokesman said.

As a further aid to software generation,

(Continued on Page 74)

Printer Line Fits DEC LP-32 Printers

STAMFORD, Conn. — Digital Associates Corp. has announced a line of printers that are compatible with Digital Equipment Corp.'s LP-32 printers. The printers can be used with DEC's VAX-11 series of processors.

The Digital Associates printers are plug-compatible with DEC's LP-32AA, LP-32BA, LP-23EA, LP-32EB, LP-32GA and LP-32GB units and can be used in conjunction with the DEC DMF-23 VAX controller. The firm offers a selection of other printers as well, Digital Associates said.

Printers range from $6,500 to $20,000, the vendor said from 1039 E. Main St., Stamford, Conn. 06902.

For Architects, Engineers, Scientists

Graphics Workstation Introduced

PITTSBURGH, Pa. — A high-resolution graphics workstation for architectural, engineering and scientific applications was introduced by Three Rivers Computer Corp. here last week.

Jointly developed by Three Rivers Computer and the UK-based International Computers Ltd., Perq 2 is the latest in the line of Perq graphics products.

Perq 2 runs under Bell Laboratories' Unix operating system and is designed to function as an independent workstation or as part of a distributed network, a spokesman for the vendor maintained.

Standard system features include a 13-in. graphics display, an 8-in., 32M-byte Winchester disk, a detached keyboard, graphics tablet and an electronics cabinet containing its microprocessor, main memory and fixed disk, according to the vendor spokesman.

Options include a 20-in. landscape display screen with 100 dot/in., an additional 32M-byte hard disk, floppy disk drive for software backup and program transportation, a ¼-in. tape streamer cartridge, a 1,000 line/min electrostatic printer/plotter and a 200 char./sec dot-matrix impact printer, the vendor spokesman maintained.

A typically configured system is priced at $24,900 and is immediately available, according to the spokesman.

More information is available from Three Rivers Computer, 720 Gross St., Pittsburgh, Pa. 15224.

Desktop Line Compatible With IBM Personal Computer

SCOTTSDALE, Ariz. — Phaze Information Machines Corp. has introduced a line of desktop computers that are compatible with IBM's Personal Computer.

The P9000 family of multifunction workstations performs the local processing tasks of the IBM Personal Computer, according to a spokesman for the vendor. The Model P9010 Information System can either emulate an IBM 3278 Model 2 or the IBM Personal Computer, performing word processing, spreadsheet planning and other Personal Computer tasks. It can access IBM mainframes through an IBM 3274 or 3276 Type A coaxial adapter port or it can communicate through an integral serial communications interface and an external modem, the vendor said. The system can also reportedly be configured with its own printer, the vendor spokesman maintained.

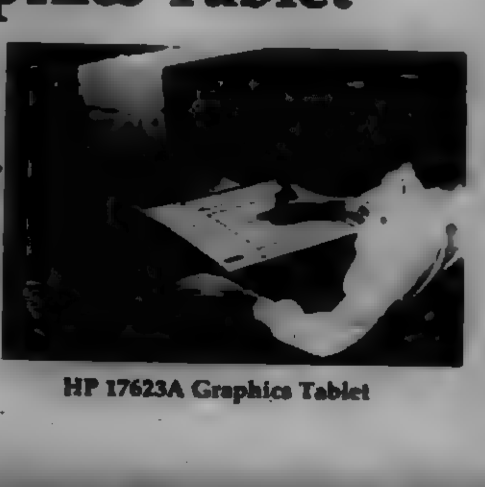
Pricing on the P9010 series begins at $4,990, the vendor said from 7650 E. Redfield, Scottsdale, Ariz. 85260.

HP Unveils Graphics Tablet

PALO ALTO, Calif. — Hewlett-Packard Co. has unveiled an interactive graphics tablet that reportedly allows users to create original computer graphics, digitized sketches, strip charts and maps on the HP 2627A color graphics terminal.

With the HP 17623A graphics tablet, a stylus pen-like device is used instead of the graphics terminal's arrow keys to develop graphics more easily, the vendor explained.

This product is priced at $1,920. Further details are available from the vendor at 3000 Hanover St., Palo Alto, Calif. 94304.



HP 17623A Graphics Tablet

Interactive Graphics Tablet

Tape Drives Fit DEC, DG Units

SOMERVILLE, N.J. — A line of magnetic tape drives for use on Digital Equipment Corp. PDP-11, LSI-11 and VAX-11 systems, as well as Data General Corp.'s Nova and Eclipse computers, has been unveiled here by Unitronix Corp.

The DMT3000 series is rack-mountable and made of a single capstan tape drive type with a tension-arm tape buffer, according to the vendor. It features recording density ranges of 800 to 1,600 bit/in., with a 45 in./sec tape speed and a rewind speed of 160 in./sec.

The tape drives are available for $7,500, complete with controller, Unitronix said from 197 Meister Ave., Somerville, N.J. 08876.

Graphics Board for Mime Unveiled

NORWOOD, Mass. — Raytheon Data Systems Co. (RDS) has expanded its RDS-200 series of information processors with the addition of two models that both feature extended global search and replacement capabilities for word processing.

The RDS-210 single diskette and the RDS-220 dual diskette systems have all the text manipulation, document assembly capabilities and menu-based formats standard with the existing RDS-200 series, the vendor said. The units also reportedly feature automatic search functions, enabling the user to find and replace systematically specified text throughout a document.

Basic pricing is $9,549 for the single diskette system and $11,105 for the dual version. Further details are available from the vendor at 1415 Boston-Providence Turnpike, Norwood, Mass. 02062.

RDS-200 Processors Expanded

ST. LOUIS — Micro-Term, Inc. has announced a graphics board for its Mime 740 terminals reportedly capable of reproducing Tektronics, Inc. Plot 10 and Digital Equipment Corp. Regis graphics packages.

In a Plot 10 mode, the board offers full Tektronics 4010 compatibility including point plot, point-to-point plot and relative color draw. The Plot 10 board costs $1,095, the vendor said.

An optional Regis mode will be available this summer and will enable the user to display normal backgrounds on four pages of memory or four shades of gray on two pages of memory. The Regis option also includes a zoom capability that can enlarge a particular display two or four times. The Regis option costs $295, the vendor said from 1314 Hanley Industrial Court, St. Louis, Mo. 63144.

Intel Announces 86/435 Processor

SANTA CLARA, Calif. — Intel Corp. has announced the 86/435, an addition to its line of transaction processors.

Aimed principally at large users and OEMs, the 86/435 can support up to four users and features multiuser, multitasking and multiprogramming capabilities, the vendor said.

The 86/435 uses Intel's Itaps operating software and costs $25,500 for a 768K-byte system with 35M bytes of disk storage and 1M byte of diskette storage, the vendor said from 3065 Bowers Ave., Santa Clara, Calif. 95051.

Alloy's Boards Link DEC, CP/M

NATICK, Mass. — Alloy Computer Products has introduced a line of 8- and 16-bit boards that reportedly enable Digital Equipment Corp.'s PDP-11 and VAX-11 minicomputers to run any Digital Research, Inc. CP/M-based software programs.

The UCP-11 is said to plug into the back of a VAX-11 or PDP-11 and acts as a co-processor executing CP/M programs, operating in parallel with the DEC processor without degrading the latter's performance. The unit can be activated from any terminal attached to a DEC network, according to the vendor.

Pricing on the boards starts at $1,495.

Further details are available from Alloy at 12 Mercer Road, Natick, Mass. 01760.

'How-to' Handbooks On OA Systems Out

CAMBRIDGE, Mass. — A "how-to" series of handbooks on implementing office automation and communications systems has been announced here by McQuillan Consulting.

The *McQuillan Action Planning Guide* consists of four volumes containing step-by-step instructions and checklists: *Planning Your Office Automation Strategy; Planning Your Architectural Design; Planning the Selection of Your Systems;* and *Planning the Implementation of Your Pilot.*

Subscription to this series costs $4,995. The first volume will be available in May, the publisher said from 380 Harvard St., Cambridge, Mass. 02138.

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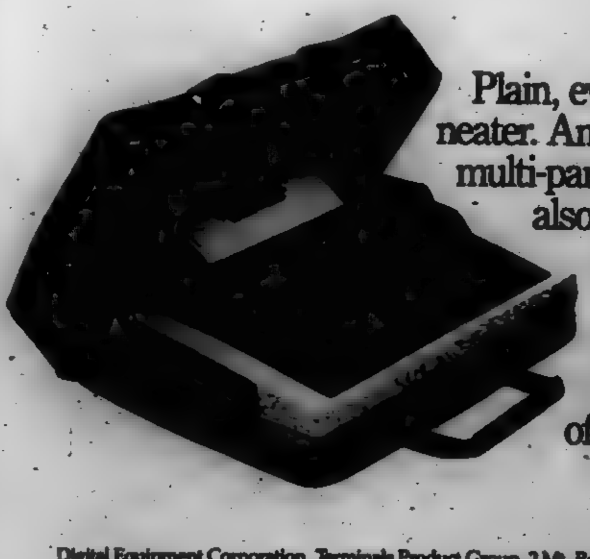

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Symbolics Lisp-Based Workstation Announced

(Continued from Page 71)

the 3600 boasts a hardware-assisted storage management capability that automates the time-consuming task of allocating and reclaiming memory space. The storage management feature relieves programmers of one of their most arduous housekeeping duties and thus enables the workers to channel their energies into more productive activities, the spokesman said.

Although its main components fit inside a workstation occupying no more desk space than a typical display terminal, the 3600 packs as much processing power as Digital Equipment Corp.'s Decsystem-2060 running Lisp. The Symbolics machine also provides two to five times more computing power than a VAX-11/780, the source said.

High on the workstation's list of key software features is its ability to support multiple programming languages, including Fortran 77, Pascal, C and Interlisp. This multilanguage capability reportedly allows Lisp initiates to migrate to the artificial intelligence language and, at the same time, preserve their large investment in existing programs.

The 3600 also supports an enhanced version of Flavors, an object-oriented programming language that permits the system's 1,100 by 800 bit-mapped video screen to create and manipulate multiple overlapping display windows, the spokesman said.

On the hardware side, the system features a 10M bit/sec Ethernet local networking capability and a choice of either color or black-and-white graphics. In addition, the workstation incorporates a stack-oriented, "tagged" architecture in which every piece of data inside the system is identified by a particular label or tag.

Purportedly designed from the ground up to run Lisp, the 3600 is said to supplant Symbolics' first product — the LM-2, a descendant of an AI machine developed at MIT.

A basic 3600 configuration incorporates 2.3M bytes of main memory, a built-in 169M-byte Winchester disk unit and a three-button mouse for cursor positioning. Options available with the system include a 20M-byte cartridge tape unit, floating-point processor and 10 page/min laser printer, among others.

A typical 3600 configuraton costs $85,000. The system is available from Symbolics at 9600 DeSoto Ave., Chatsworth, Calif. 91311.

Subsystems Target DEC

WESTMONT, Ill. — First Computer Corp. has introduced a family of magnetic tape storage systems based on Cipher Data Products, Inc.'s Cachetape 125.

The tape subsystems are compatible with Digital Equipment Corp.'s LSI-11, PDP-11 and VAX-11 computer systems, according to the vendor. They are available in two models: the TS09/TSVO9 series, which provides single 1600 bit/in. density, and the TS10/TSV10 series, which provides dual 1600/3200 bit/in. densities.

Prices for these products start at $7,800. Additional details can be obtained from 645 Blackhawk Drive, Westmont, Ill. 60559.

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Specifically, MSP's MANAGER family helps you model and document data structures and programs, and helps you design data base and file systems.

Disaster Recovery Service Offered

RADNOR, Pa. — A disaster recovery service has been announced here by Sun Information Services Co. (Sungard).

The Testable Contingency Plan reportedly provides organizations of all sizes with a customized tested disaster recovery plan. A typical plan would, for example, define the client's disaster recovery organization, outline procedures for initializing the disaster recovery process and for restoring processing, define site restoration and provide for two tests at a Sungard Recovery Center, according to a spokesman.

Pricing on these services depends on the size of the company and installation. Further details can be obtained from Sungard at 280 King of Prussia Road, Radnor, Pa. 19087.

Multiuse Diagnostic Tool Targets Nets

ATLANTA — Computer Peripheral Systems, Inc. has introduced a multiuse diagnostic and installation tool for data communications networks.

The product, called Tap, is said to provide bidirectional line monitoring as well as other utility functions.

The pocket-sized product requires no ac power and is intended for both portable and permanent installations. It sells for $225. The vendor can be reached through P.O. Box 98282, Atlanta, Ga. 30359.

Anadex DP-9625A Printer Receives Enhancements

CHATSWORTH, Calif. — Anadex, Inc. has enhanced its DP-9625A, a multimode printer. The unit now provides both single- and double-pass printing to achieve near letter-quality printing. The unit can also produce correspondence, condensed and data processing quality printing as well as graphics.

Also, the vendor has added an additional mid-range print speed. The unit now can print at 60 char./sec at 12 char./in. with proportional spacing, the vendor said.

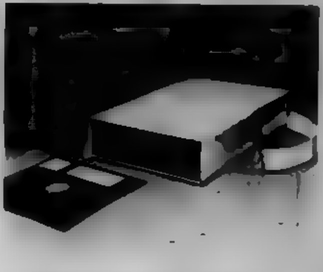
The DP-9625A costs $1,995, the vendor said from 9825 DeSoto Ave., Chatsworth, Calif. 91311.

Floppy Drive Out for Apple

REDWOOD CITY, Calif. — A floppy disk drive for Apple Computer, Inc. Apple microcomputers has been introduced by Algol Technology, Inc.

The Model FDD-810 Thin-Line Floppy Disk Drive has a rear-panel locked switch that reportedly overrides the write-protect notch on diskettes. The switch does away with the use of tape or cutting holes to change or reverse diskettes.

The disk drives cost $350 each. Algol Technology is located at 303-3 Convention Way, Redwood City, Calif. 94063.



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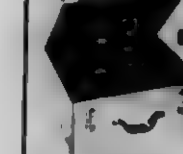

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In a unit that takes no more space than a daily newspaper, the DN300 gives you a high performance, 32-bit virtual memory processor, high-resolution bit map graphics, and an integrated local area network that provides network-wide virtual memory access.

The DN300, latest in the family of DOMAIN processing nodes, supports up to 1.5 million bytes of main memory and 15 concurrent processes of 16 million bytes each, so you can execute large programs. Its 17-inch 1024 x 800 pixel landscape display provides the high-resolution graphics you need for technical applications. The 12 million bit-per-second high speed token-passing network lets you access data anywhere in the network without sacrificing performance. And the DN300 is supported by an optional local hard disk as well as a full complement of network peripherals and gateways.

The DN300 is fully compatible with Apollo's DN400, DN420, and DN600 color computational nodes and supports the same multiprogramming environment, large virtual address space, network communications, multiwindow display management, and extensive command library as other DOMAIN nodes. The DN300 connects directly and easily to any new or existing Apollo DOMAIN network. Or it can be used as a standalone workstation. Which means that you can configure the type of network that exactly suits your staff and working environment.

SOFTWARE YOU NEVER THOUGHT YOU'D SEE ON YOUR DESKTOP.

Standard with every DN300 node is AEGIS, the only network-wide virtual memory operating system available today.

Optional software includes ANSI-standard FORTRAN 77, Pascal, C, SIGGRAPH Core Graphics Library, X.25, IBM HASP, IBM 3270, D3M distributed database management system and AUX, a software environment based on UNIX™ System III.

More than 50 available third party application software packages include MSC/NASTRAN and ANSYS, two highly regarded finite element analysis programs; PATRAN-G, an interactive finite element pre- and post-processor; SCRIBE, a text formatting and document production system; and DISSPLA and TELL-A-GRAF, the leading data representation graphics software packages.

NEW DOMAIN SERVER PROCESSOR—A LOW COST WAY TO HANDLE NETWORK PERIPHERALS AND GATEWAYS.

The new DSP80, an intelligent peripheral server that connects to the Apollo DOMAIN network, lets users freely share the same, centrally located peripherals. That relieves individual nodes of the burden of peripheral support. So nodes have more time and more power available to handle specific application-related computing.

And you save money by sharing your expensive peripherals—disks, tape drives, printers and plotters. The DSP80 also provides every user with access to specialized services such as communication gateways, large-scale file storage, and print/plot spooling.

UNIX is a trademark of Bell Laboratories.

USA price $9,933, system builder, quantity 35 DN300 with .5Mb memory, 17-inch graphics display, network interface, and AEGIS operating system.

FIND OUT MORE ABOUT THE DN300 DESKTOP MAINFRAME.

The Domain network gives you low entry cost, high performance, easy and natural incremental growth, reliability, and long-term investment protection. And it gives your technical staff the excitement and satisfaction of working with an innovative, highly productive new tool.

For more information on the Apollo Domain processing system, call Apollo's marketing department at (617) 256-6600, extension 608, or write Apollo Computer Inc., 15 Elizabeth Drive, Chelmsford, MA 01824, attention Marketing Communications.

☐ Send me more information on Domain Processing.
☐ Please have a sales representative call me.

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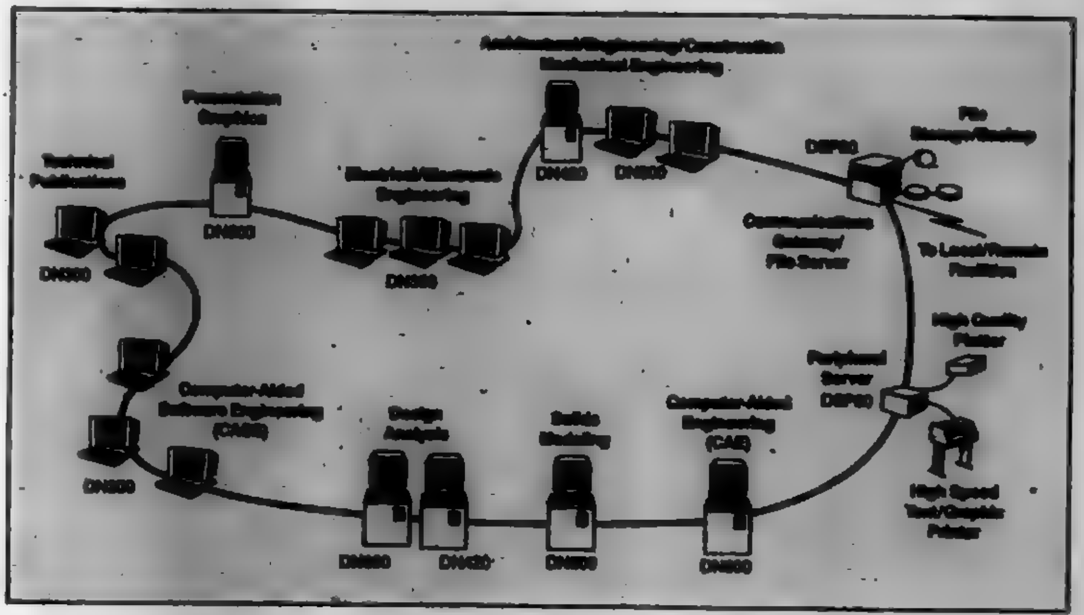
A Domain professional productivity network puts an application specific mainframe on every user's desktop:

The truly exciting aspect of a Domain network is its ideal combination of individual initiative and teamwork. Users get not only the benefits of a high performance, 32-bit computer dedicated to their application, but also retain the benefit of shared resources.

For example, use the DN600 full color graphics computational node for solids modeling, VLSI CAD, finite element analysis, pre- and post-processing, 3-D drafting, and image analysis. Or use it as a full-function CAE workstation . . . The DN420 and DN400 handle the same applications except in monochrome. Use the economical new DN300 desktop mainframe in applications such as computer-aided software engineering, design documentation, high-quality presentation graphics, engineering and manufacturing database management, drafting, and electrical design capture and simulation.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DN420
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Communications Gateway/File Server
To Local/Remote Facilities
High Quality Plotter
Peripheral Server DSP80
Computer-Aided Software Engineering (CASE)
Design Analysis
Solids Modeling
Computer-Aided Engineering (CAE)
High Speed Text/Graphic Printer
DN300
DN600
DN420
DN600
DN600

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Bits & Pieces

Model-ISO-11 Isolator Protects Against Crashes

NATICK, Mass. — Electronics Specialists, Inc. has announced Model-ISO-11 Super Isolator to protect software from system crashes, memory loss and various other glitches.

This product features two individually dual-Pi filtered ac socket banks, and spike/surge suppression is incorporated into its design, according to the vendor. Equipment interactions are eliminated; disruptive or damaging line spikes and hash are controlled; and programs operate more smoothly, the vendor claimed.

The Super Isolator is priced at $115.95. The vendor can be reached through P.O. Box 389, Natick, Mass. 01760.

Available Main Memory On FPS Processor Boosted

BEAVERTON, Ore. — Floating Point Systems, Inc. has increased the available main memory on its FPS-164 attached processor from 14.5M to 58M bytes. The FPS-164 is a scientific processor that can be attached to various vendors' systems.

Available in May, users will be able to select from 11 optional main memory sizes ranging from 2M to 58M bytes. The additional memory, the vendor said, will allow users to produce more detailed computer models in structural analysis, oil reservoir simulation and computational physics and chemistry applications.

FPS-164 systems cost from $300,000, the vendor said through P.O. Box 23489, Portland, Ore. 97223.

Companion Package Series Provides Power Standard

LORAIN, Ohio — Lorain Products has announced a line of 150W and 300W switching regulated power supplies for industrial and computer applications.

The Companion power package series, intended for medium-range electronic systems, provides a standardized, switch-mode ac/dc power supply with a range of single or multiple outputs, according to the vendor. The units are convection-cooled to provide regulated power with a minimum 70% efficiency rate, the vendor added.

Prices for the Companion series start at $315. More information can be obtained from the vendor at 1122 F St., Lorain, Ohio 44052.

Plotter Controller Interface Targets IBM 360, 370 Users

ANAHEIM, Calif. — California Computer Products, Inc. has introduced two plotter controller interfaces that reportedly enable IBM 360 and 370 users to utilize any Calcomp plotter.

The Hasp and the Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) are single-printed circuit boards that mount in either the 951 or 953 vector-to-raster controllers. The Hasp emulates an IBM 360 or 370 Hasp remote job entry (RJE) workstation, while the SNA/SDLC emulates the IBM 3776 Models 3 and 4 and IBM's 3777 Model 3 RJE workstations, the vendor said.

Pricing on the interfaces ranges from $3,500 to $5,000. Calcomp is based at 2411 W. La Palma Ave., Anaheim, Calif. 92801.

Adapter Upgrades SMC-70 To True 16-Bit System

NEW YORK — Sony Corp. of America has developed a 16-bit adapter that upgrades its SMC-70 microcomputer to a true 16-bit system.

Called the 16-bit Supercharger, the device reportedly converts the SMC-70's 8-bit architecture to a true 16-bit architecture. The vendor said the enhancement includes a standard 256K bytes of on-board memory that can be enhanced to 768K bytes.

The Supercharger employs Intel Corp.'s 8086 microprocessor and can concurrently support Digital Research, Inc.'s CP/M and Microsoft Inc.'s MS-DOS operating systems, the vendor said.

The Supercharger costs about $1,000, according to the vendor at 9 W. 57th St., New York, N.Y. 10019.

Check Signer/Imprinter Unveiled by Tab Products

PALO ALTO, Calif. — A check imprinter for 11-in. continuous form letters, 11-in. voucher checks, purchase orders, mail promotion items and 3⅔-in. checks has been introduced here by Tab Products Co.

The Model 2434 Check Signer/Imprinter runs at speeds up to 100 feet/min. and offers a counter that can reportedly be reset, a tractor fee for printing registration, a start/stop/jog switch, a pilot light that indicates when the machine is on and an on/off power control key. A final form stop switch stops the machine when the check runs through and makes it possible for the machine to run unattended, the vendor said.

Prices start a $1,300 for the Model 2434. Further details are available from Tab at 2690 Hanover St., Palo Alto, Calif. 94304.

CPP Upgrades Mini-Rups For IBM 3081, Amdahl CPU

GARDENA, Calif. — Computer Power Products has upgraded the Mini-Rups rotary uninterruptible power system to the Mini-Rups 415, designed for use with IBM's System 3081 and Amdahl Corp.'s 580 415 H mainframe.

This system combines inertia ride-through for momentary outages and battery backup for blackout in a computer-grade motor generator set, according to the vendor. The product has no air conditioning requirement and features 100,000-hour mean time between failures, according to the vendor.

The Mini-Rups 415 is available in the range of 12 to 50 kVA, with prices beginning at $28,000.

Further details are available from Computer Power Products, located at 227 E. Compton Blvd., Gardena, Calif. 90248.

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Bits and Pieces

Turnkey System Released, Based on HP 250/Model 20

FOREST HILL, Md. — Maryland Computer Services, Inc. has announced a turnkey computer system for forms distributors.

Called the FMS 250, the system is based on a Hewlett-Packard Co. HP 250/Model 20 minicomputer and features a forms management system to requisition, procure, warehouse, distribute and inventory client forms. The system generates all documents necessary for warehouse control and produces financial and management reports, the vendor said.

The system costs $34,500 from the vendor at 2010 Rock Spring Road, Forest Hill, Md. 21050.

Percom Data Publication Released for Micro Users

DALLAS — "Inside Personal Computer Disk Storage Systems" is the name of a recently published booklet from Percom Data Corp.

The publication is intended for those users who want more in-depth knowledge about the operation of a microcomputer system. It reportedly examines, in nontechnical terms, both floppy and hard disk micro storage systems as well as controllers and operating systems.

Cost of the booklet is $5. Percom is located at 11220 Pagemill Road, Dallas, Texas 75243.

Comark Disktor M-2 Debuts, 16-Bit, 128K-Byte Micro

WALTHAM, Mass. — Comark Corp. has announced the Diskstor M-2, a microcomputer system based on the Intel Corp. 8086 16-bit microprocessor.

The Diskstor M-2 includes 128K bytes of main memory, serial and parallel interface ports and dual double-sided floppy disk drives. The unit is compatible with Intel's Multibus and includes an 8-slot Multibus card cage, the vendor said.

The Diskstor M-2 costs $8,590, according to the vendor at 257 Crescent St., Waltham, Mass. 02154.

RAM Extender Introduced For Apple II's Appli-Card

SAN DIEGO — Personal Computer Products, Inc. has announced a 128K-byte random-access memory extender for its Appli-Card expansion interface port for Apple Computer, Inc. Apple II microcomputers.

Appli-Card incorporates a board-level Zilog, Inc. Z80 microprocessor and can operate as a stand-alone processor or simultaneously with a Commodore Business Machine, Inc. 6502 processor, the vendor said.

The Appli-Card costs $295. The 128K-byte extender costs $495 and a 64K-byte extender costs $395. The vendor is located at 16776 Bernardo Center Drive, San Diego, Calif. 92128.

Memory Cache Out for Users Of Centennial Subsystem

ROCKVILLE, Md. — Centennial Computer Products, Inc. has announced Smart Cache, a heuristic cache memory for the firm's disk subsystems that are compatible with Sperry Univac 1100 series processors.

Smart Cache is high-speed semiconductor memory that resides in a Centennial dual controller. The memory is supported by the Univac 5046/5056 disk handler and Univac operating systems, the vendor maintained.

Centennial's disk subsystems cost from $209,000 for a four 675M-byte drive subsystem with 2M bytes of Smart Cache, according to Centennial Computer Products at 6100 Executive Blvd., Rockville, Md. 20852.

Monopowerpac Features Power Add-On Capability

RICHMOND, Va. — Power Systems & Controls, Inc. has announced a power supply product that offers power conditioning and distribution and an uninterrupted power supply add-on capability in a noise-controlled module.

The Monopowerpac features the vendor's cycle-on-line circuitry and an automatic bypass to prevent interruption of computer operations. A microprocessor panel with digital readout, LED alarm indicators and power flow mimic are also standard features, the vendor said.

Pricing on the Monopowerpac ranges from $25,500 to $33,500, depending on requirements. More information is available from 3206 Lanvale Ave., Richmond, Va. 23230.

Bunker Ramo Micro Runs On Unix, Targets Banks

TRUMBULL, Conn — Bunker Ramo Information Systems has announced a microcomputer system that helps retail branches of banks manage increasing numbers of financial services.

The Aladdin 30 System reportedly addresses an unlimited number of bank applications. The machine is designed around the Motorola, Inc. MC68000 microprocessor chip, and it runs under Bell Laboratories' Unix operating system.

It also features built-in word processing capabilities, as well as teller-transaction software that enables the system to process all types of regular customer transactions.

Prices for the Aladdin 30 series start at $23,000. Further details are available from the vendor at 35 Nutmeg Drive, Trumbull, Conn. 06609.

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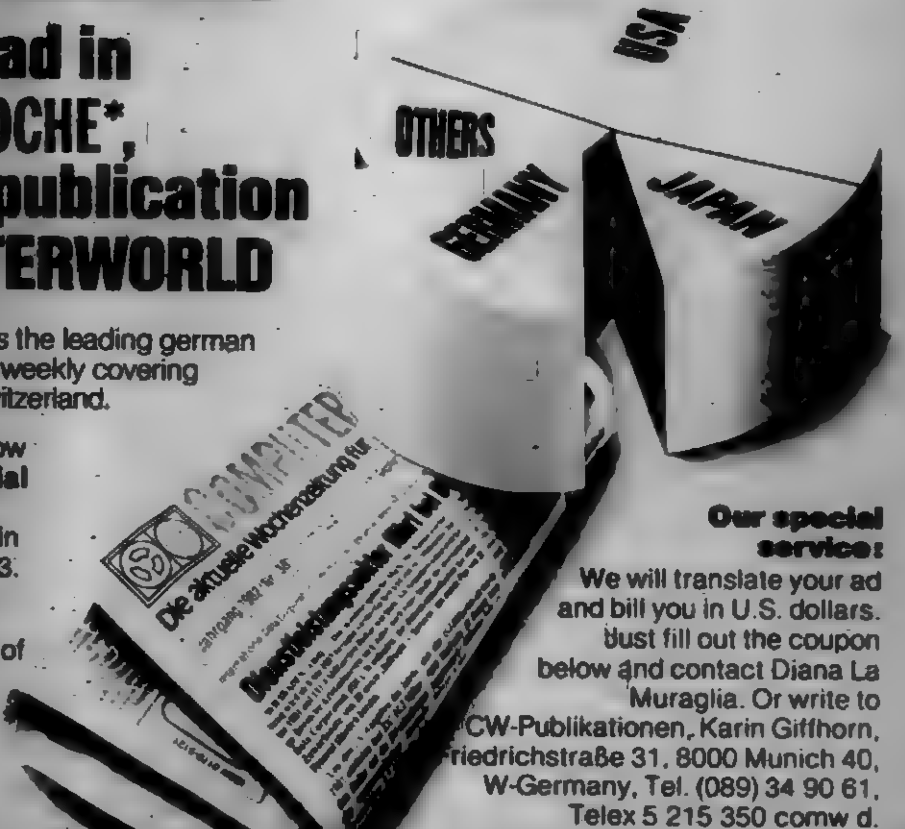

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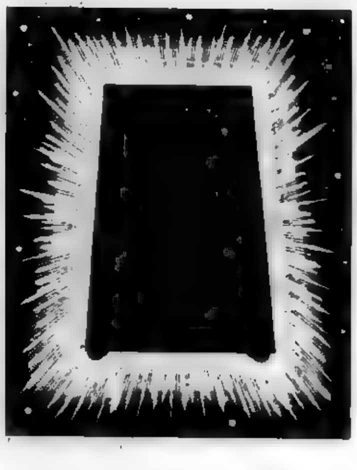

If you decided to buy a computer system before 11 A.M., March 2nd, it was possible to make a purchase decision without fully considering Data General.

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Yet the Eclipse MV/10000 is only the most recent in a series of steps we have taken to make Data General computers overshadow Digital's entire line of VAX computers.

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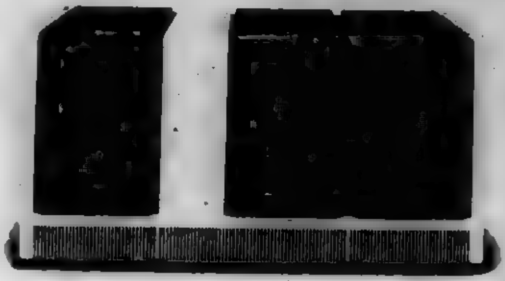

PERFORMANCE. The Eclipse MV/10000 executes 2500 kwets/sec. And transfers I/O at 28.6 mb/sec. The VAX 11/780 executes* 1200 kwets/sec. And transfers I/O at 13.3 mb/sec. A comparison that's no comparison.

RANGE. With the Eclipse MV/10000, Data General has a broader line of 32-bit computer capability than Digital. Which means a Data General computer will better fit your exact needs. Whatever those needs may be.

PRICE. When you compare Data General Eclipse MV computers against Digital's VAX computers on the basis of price,* you get a very interesting perspective. The Eclipse MV/10000 has the same price as the VAX 11/780, but twice the performance. And the recently announced Eclipse MV/4000 has twice the performance of a VAX 11/730 at the same price.

COMPATIBILITY. We at Data General have made it a top priority to make our system's software and I/O compatible. So if your needs ever change, you can take your investment in software and peripherals onto other Data General computers. Which is something you can't do with Digital's VAX computers.

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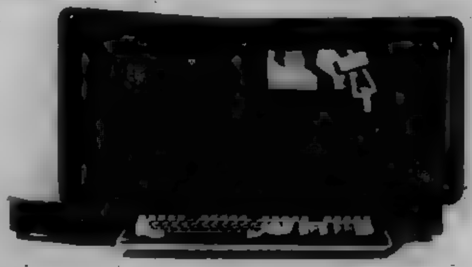
Our systems software covers a wide range of applications – including Data Communications, Networking, Time-Sharing and Office Automation. Plus all the standard development languages. All to industry standards. And third-party applications software for mechanical, electrical and architectural engineering; imaging and process control.



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Data General

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*Sources include trade press articles, Digital literature, industry reporting publications and data supplied by industry reporting services.

Memory, Error-Correction Out for MAI System 810

TUSTIN, Calif. — The Basic Four Information Systems Division of Management Assistance, Inc. (MAI) has announced a memory expansion and parity error-correction chip options for its System 810 computer.

The memory expansion reportedly doubles the 810's storage capacity from 2M bytes to 4M bytes with the aid of 64K bytes of random-access memory. The error-correction code chip, priced at $500 per 512K bytes, offers increased reliability and reduced downtime in case of memory board failures.

The 810 with expanded memory starts at approximately $117,000 and the parity chip is available for approximately $5,000. • The vendor is at 14101 Myford Road, Tustin, Calif. 92680.

Subsystems Released for Micros

VIENNA, Va. — PH-Associates, Inc. has announced the Mark-20, Mark-33 and Mark-46 disk subsystems for a variety of microcomputers.

Available in 20M-, 33M- and 46M-byte configurations, the units feature a 30 msec access speed, a 5M bit/sec disk transfer rate and interfaces for a variety of microcomputers including IBM's Personal Computer and Apple Computer, Inc. processors, the vendor said.

Disk subsystems cost from $3,000, the vendor said from 8720 Old Courthouse Road, Vienna, Va. 22180.

Unitronix Unveils System Based on DEC's PDP-11

SOMERVILLE, N.J. — Unitronix Corp. has announced the System 2000, a computer system based around the Digital Equipment Corp. PDP-11 processor.

The System 2000 features 256K bytes of main memory, 160M bytes of Winchester disk storage, a standard 45 in./sec, nine-track tape drive, a DEC VT100 CRT terminal and a DEC LA120 printer. The system can be expanded to 4M bytes of main memory.

System 200 is compatible with DEC's RSTS/E, RSXIIM, TSX and Bell Laboratories' Unix operating systems and is priced from $32,000, the vendor said from 197 Meister Ave., Somerville, N.J. 08876.

System Out For Drafting

AUSTIN, Texas — Bausch & Lomb, Inc. has announced a multiple-station system as the latest addition to its family of electronic drafting systems.

Capable of supporting up to six drafters, the Multistation Producer features a host computer, alphanumeric screen, plotter and two interactive workstations, as well as all software necessary for system operation.

The above configuration is priced at $79,900 and additional stations can be added at $24,900 each. The vendor is at 1212 E. Anderson Lane, Austin, Texas 78752.

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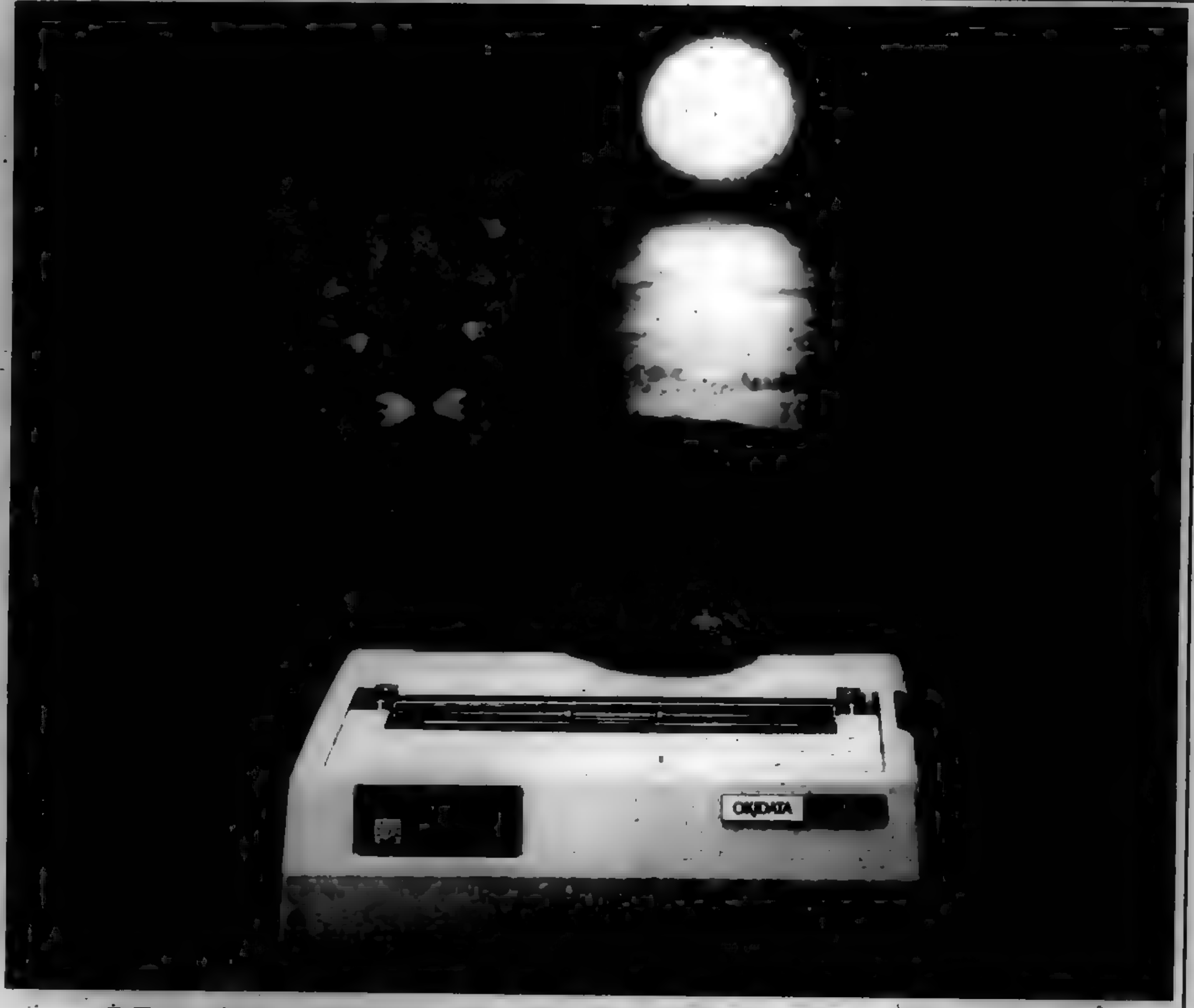

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Okidata's new multifunction Microline (ML) 92 printer is just the animal. For letters, memos or manuscripts, this advanced dot matrix printer gives you text printing that's a match for any daisywheel's. It prints graphs, charts and illustrations. Even emphasized and enhanced printing to help you stress a point. As for data processing, this cat doesn't pussyfoot around. Information flies from the 92 at 160 cps. And there's an ML 93, too, that adds wide-column printing to the picture.

Like each in our full line of high performance printers, the new ML 92 and 93 are built strong to keep on running, right down to the print head that's guaranteed for one full year. But the really great news about each is price: $699 suggested retail for the ML 92; slightly more for its wide-column partner. Absolutely purrrfect.

For more detailed information, and for the name of the dealer nearest you, call 1-800-OKIDATA. In NJ, 609-235-2600.

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Univac's Sperrylink Gets Voice Processing

Sperry Univac VIP

BLUE BELL, Pa. — Sperry Univac has jumped on the voice store-and-forward bandwagon with the introduction of voice processing for Sperrylink — the mainframe manufacturer's four-month-old entrant into the office automation market, which is designed to integrate such office functions as word processing, data processing and personal computing.

The Voice Information Processing Station (VIP) is a computer-based 24-hour message center that allows voice messages to be stored and forwarded. The system digitally accepts, records and stores speech in the sender's voice. A Touch-Tone telephone allows the user to store a message on disk. Nonsystem users can call in and leave messages on the system for users.

The system can be used as a stand-alone system or as part of the Sperrylink system, a vendor spokesman said. When installed as a component of the office system, VIP becomes part of an integrated system by providing a visual notice on a desk station when voice mail is received, a vendor spokesman said.

Capable of handling from two to 12 telephone channels and servicing from 200 to 1,000 users, the VIP station is designed to work in conjunction with any private branch exchange (PBX) and a telephone company central office system, according to the vendor.

In operation, registered users enter an identity number and password into the VIP station. They are recognized by name and given a display of the number of new messages. Users can then use any of the four major functions of the station:

- Incoming Messages. The user receives a summary list of messages consisting of the name of the originator or forwarder and a sequential, numeric indicator for each message. After listening to the message, the station provides instructions for replying, forwarding or saving the message and for selecting another.
- Creating Messages. Messages can be recorded and sent to individual users and distribution lists. Basic editing functions such as stop/start, skip and delete are

(Continued on Page 86)

Rapicom 3100, 3300 Get CCITT Compatibility

FAIRFIELD, N.J. — Rapicom, Inc. has announced CCITT Group 1 and Group 2 compatibility and a Programmable Autodialer for the firm's Models 3100 and 3300 desktop digital facsimile transceivers.

The CCITT Group 1 and Group 2 option permits automatic interface with slower speed analog facsimile machines.

The Autodialer serves as a memory telephone with speed dialing and as a controller for unattended transmission/polling functions.

Base price for the 3100 is $4,600, and the 3300 is $5,000. Group 1 and Group 2 compatibility costs an additional $800; Group 2 compatibility alone costs $450, and the Autodialer costs $900. All products are available on a rental basis as well, a spokesman said from 7 Kingsbridge Road, Fairfield, N.J. 07006.

Workstation Line Targets 3278 Unit

SCOTTSDALE, Ariz. — Phaze Information Machines Corp. has introduced a line of multifunction workstations said to be plug-compatible replacements for the IBM 3278 Model 2 terminal. They also reportedly perform the local processing tasks of the IBM Personal Computer.

The Phaze P9010 information system can perform word processing, spreadsheet planning and can access IBM mainframes through an IBM 3274- or 3276-type coaxial cable port. It can also communicate through an integral serial communications interface and an external modem, the vendor said.

Along with the P9010, the vendor has also introduced the P9002 Information Processing Facility, an upgrade kit that can give the Phaze P3278 Display Station the functional capabilities of the P9010. The upgrade kit can also be used for an IBM 3278 Model 2 terminal to become part of a workstation with the capabilities of the P9010.

The P9010 is available for $4,990, and the P9002 is priced at $3,195. Both products will be available in April from Phaze Information Machines, Suite D7, 7650 E. Redfield Road, Scottsdale, Ariz. 85260.

Turnkey Out For Graphics

MINNETONKA, Minn. — Digigraphic Systems Corp. has introduced a graphics communications turnkey system said to combine data analysis, color graphics and business analysis and forecasting.

Graphcom uses the vendor's Execuvision software and Graphcom Executive Information Station (EIS) based on Digital Research, Inc.'s CP/M operating system. EIS also features a 13-in. color monitor, keyboard, floppy disk, multiple hard disk options and a 300- to 1,200 bit/sec autodial modem. In its basic configuration, the system allows automatic chart and graph creation from spreadsheet files that have been entered and stored on the system.

The system is available for $13,500 to $30,000, depending on configuration from the firm at 10273 Yellow Circle Drive, Minnetonka, Minn. 55343.

NET 8-16 Ups Storage Limit

SAN LEANDRO, Calif. — Local-area network software said to allow Compupro Systems, Inc.'s multiuser microcomputer system users to increase the maximum number of active workstations and their storage capacity has been announced by Gifford Computer Systems, Inc.

NET 8-16 is designed for linking Digital Research, Inc. MP/M-86- or MP/M 8-16-based Compupro System 816 computers, while supporting simultaneous 8- and 16-bit program operation. Previously, only single-user workstations could support CP/M applications programs within a local-area network, according to the vendor.

Base price for the software is $1,995 from the vendor at 1922 Republic Ave., San Leandro, Calif. 94577.

Text Editor Unveiled By 3M Corp.

ST. PAUL, Minn. — 3M Corp.'s Office Equipment Division has introduced a text editor said to combine the features of an electronic typewriter, double-density floppy diskettes and a CRT screen 25 lines deep by 80 char. wide.

The 900 Text Editor uses a modified version of the 3M basic typewriter, the Model 200, and may be used alone or connected to the CRT-processor-disk drive unit. The modular unit can be moved from one work area to another to connect to different Model 200s, a vendor spokesman said.

An additional key pad on the Model 200 provides cursor control keys and single-function keys. Text editing capabilities include decimal tab, automatic column layout, automatic underline, double underline and boldface. Other features include search and replace, block delete, forms fill-in, stop codes for form letters and paragraph adjustment after correction.

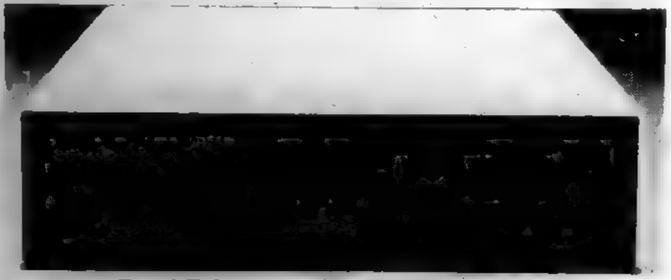
The Model 200 with interface is available for $1,699 and the modular unit Text Editor for $3,495. Together, they cost $4,995. 3M can be reached at Department OF83-5, P.O. Box 33600, St. Paul, Minn. 55133.

3M Corp. 900 Text Editor

Racal Telesystems Unveils Protocol Translators

CHICAGO — Racal Telesystems, Inc. has introduced three models of protocol translators said to permit normally incompatible word processing systems to communicate with each other. Seventeen word processing systems can use the translators, including systems from IBM, Digital Equipment Corp. and NBI, Inc.

The Model 101 provides protocol translation for dedicated communications between two word processors. Multiple word processing systems can communicate with each other using the Model 202. The Model 404 allows different word processing systems to communicate with a central word processing system.



Racal Telesystems' Protocol Translator

The Model 101 is available for $3,995, the Model 202 for $3,195 and the Model 404 for $4,995 from Racal-Telesystems, Inc., 410 N. Michigan Ave., Chicago, Ill. 60611.

Burroughs Users Offered Electronic Mail Program

CONCORDVILLE, Pa. — An electronic mail program for Burroughs Corp. large systems users has been unveiled by Mentor Consultants, Inc.

Mentor/Mail reportedly allows updating of prices, data and products; contact by executives to their home offices in hard copy from any telephone, including booths and radio telephones; and the ability to send over 100 documents at one time.

The software runs under Burroughs' Cande command and edit language. The package maintains a data base of messages and a directory of users. The base price is $4,995 from the vendor through P.O. Box 489, Concordville, Pa. 19331.

Courses Out On CEO, AOS

WESTBORO, Mass. — Data General Corp.'s Educational Services has announced the availability of two self-study courses designed for users of the DG CEO and AOS and AOS/VS operating systems.

The "CEO Word Processing" self-study course teaches the user how to enter and manipulate text, use advanced editing functions and create different text formats. The "AOS, AOS/VS Operator" course is designed for users responsible for daily systems operation.

The CEO course is available for $350, and the AOS or AOS/VS course for $695 from DG's Educational Services, MS F019, 4400 Computer Drive, Westboro, Mass. 01580.

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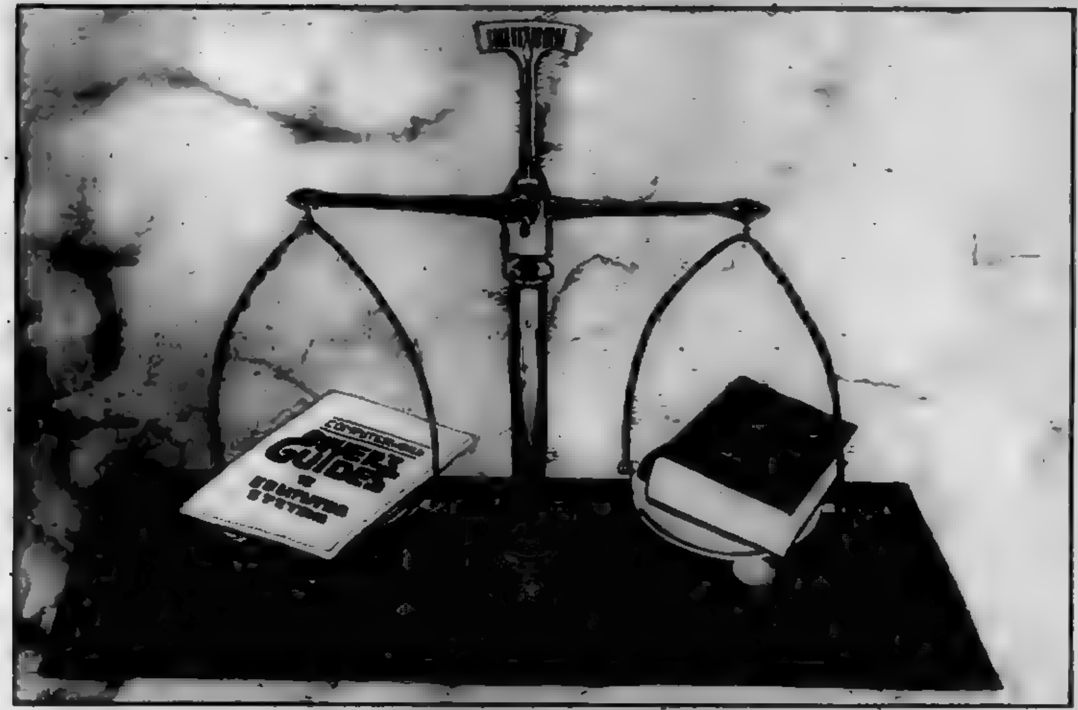

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The *Computerworld Buyer's Guide to Computer Systems* is the first in our series of market-specific directories to computer-related vendors, products and services. It will cover the market at the "core" of the computer revolution — the processor — with everything from micros to mainframes.

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The issue date for the *Computerworld Buyer's Guide to Computer Systems* is August 3. Advertising space close is June 17. Watch for the additional guides from *Computerworld* in 1983: *Terminals & Peripherals and Software.*

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Easy Text WP Package Fits IBM System/34

ROCKPORT, Mass. — Para Research, Inc. has announced a word processing package for the IBM System/34 called Easy Text.

The package is intended to create page designs compatible with most printers, tabulate up to seven columns of text or data (double that for long-line entry), create lines or formats up to 132 columns wide, move or copy paragraphs within a document, include paragraphs or lines from other documents, append paragraphs, underscore, emphasize words using boldface or double-striking and force hyphenation.

Designed specifically for nontechnical office workers, Easy Text is priced at $750 from Para Research, Whistlestop Mall, Rockport, Mass. 01966.

PE Program Unveiled for Tads

NORWALK, Conn. — Perkin-Elmer Corp. has released a software program called Pecowriter for its Thermal Analysis Data Station (Tads). Pecowriter reportedly converts Tads into a fully functional word processing system, allowing entry and storage of text on disk as well as text manipulation and editing in a conversational format.

In addition, PE is offering several general software programs for Tads, including Data Management Software-200 (DMS-200) for data and sample management; Intelligent Communications Software program for two-way intelligent communications; and a Basic software program.

Prices are $450 for Pecowriter, $950 for DMS-200, $570 for Intelligent Commnications Software and $680 for the Basic program, from the vendor at Mail Station 12, Main Ave., Norwalk, Conn. 06856.

WP, Communications Aids

Softest Offers OA Packages

RIDGEWOOD, N.J. — Softest, Inc. has introduced two office automation software products — a word processing package and a communications package.

Lex is a WP package said to include documentation preparation; a spelling dictionary of more than 100,000 words; a mass mailing system with a data base; and a built-in, four-function calculator. Lex will run on systems based on Motorola, Inc. 68000s, Intel Corp. 8086s and Perkin-Elmer Corp. 3200 systems. It costs between $650 and $950 depending on the number of users.

Sofgram, an electronic communications manager, is said to guide the user through message creation and transmission via Telex, TWX and direct-dial networks as well as intracomputer electronic mail. The package is available for Bell Laboratories' Unix-based systems and costs $500.

More information is available from Softest, 555 Goffle Road, Ridgewood, N.J. 07450.

Sperrylink Gets Message Center

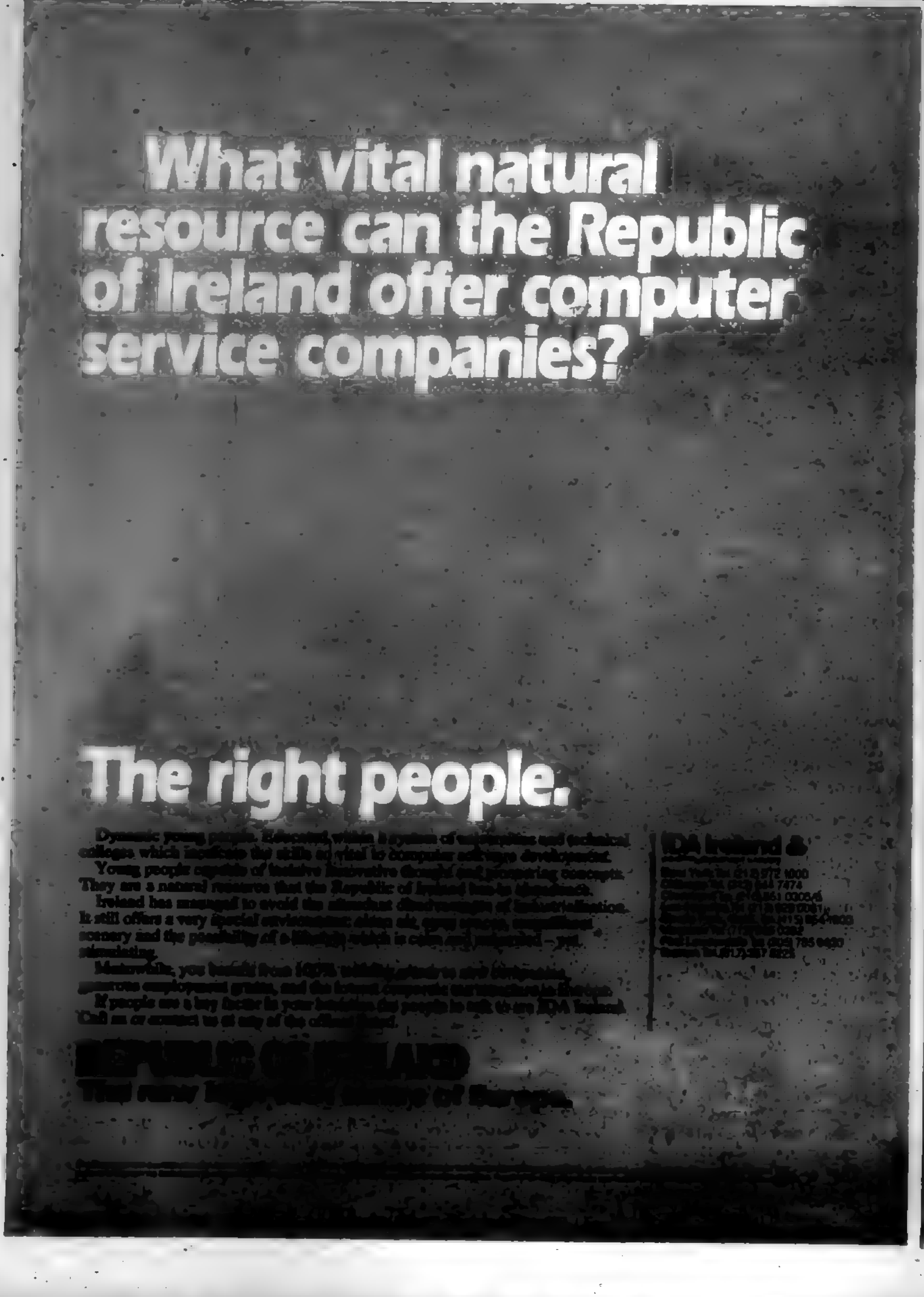
(Continued from Page 83)

available while recording.

- Outgoing Message Status. This function provides a summary listing of each message the user has sent and its delivery status. By entering codes, the station provides the time a message is delivered, plays back the message and offers options to delete messages.
- Personalizing Service. This function allows each user to create and change up to 10 distribution lists with up to 100 names, user passwords, telephone numbers and information such as where the user may be reached.

The VIP Station consists of a UTS 10 display terminal, a Model 0797 tabletop printer, a Model F2834 disk drive with a maximum capacity of four drives — each capable of storing 100M bytes of data and a Model 8406 diskette subsystem.

The VIP Station will be available in July for $126,000 to $210,000, including software. More information is available from Sperry Univac, P.O. Box 500, Blue Bell, Pa. 19424.



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Industrial Policies Of Japan Probed In Commerce Study

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Commerce Department has reported that a study of Japanese industrial policies does not support the view that U.S. computer and other high-technology industries face overwhelming competition from a Japanese industry marching in lockstep to government orders.

"A brief description of the array of Japanese [industrial] policy instruments gives the illusion of a more monolithic system than actually exists," the Commerce Department said in a new report on Japanese industrial policies and their relation to the development of that country's computer and aircraft industries.

This is not to say that policymaking and implementation efforts have not been successful already in protecting and promoting the Japanese computer, semiconductor and electronics industries.

On the contrary, the report said that through government direction, extremely favorable financing mechanisms, government-orchestrated joint research and development projects and a buy-Japan policy that Japan's computer industry has all but caught up with its American counterparts,

(Continued on Page 94)

State Tax Authorities Look To Software for Revenue

By Lois Paul
CW Staff

As a result of cutbacks in federal aid, some state tax authorities are looking to software as a future source of sales tax revenue.

This seems to be the case with bills pending in Massachusetts and North Carolina that essentially are attempting to redefine tangible personal property to include computer programs.

In Massachusetts, House Bill 2239 is intended to amend the definition of "tangible personal property" to include any computer program, whether it is a systems or application program, machine-readable or human-readable, prewritten or custom-designed.

> *'The 14th Amendment is supposed to protect us against arbitrary government action . . . I maintain it is unreasonable and irrational and a violation of the 14th Amendment to call an intangible tangible.'*
>
> — Robert Sherin
> DPMA Legislative Adviser

House Bill 327 in North Carolina, which was scheduled for a third reading in the House of Representatives last week, is an act to include certain computer programs in the definition of tangible personal property under the sales and use tax provisions. This will include "prewritten computer programs, either in the form of written procedures or in the form of storage media," but will not include "the design, development, writing, translation, fabrication, lease, license to use or consume or transfer for a consideration of title or possession of a custom computer program," according to the text of the bill.

A public hearing regarding Massachusetts House Bill 2239 will be held on April 6 at the State House in Boston. At the same time, Senate Bill 1693 will be addressed. According to its author and co-sponsor, Robert Bigelow, attorney and editor of the *Computer Law & Tax Report*, Senate Bill 1693 is the opposite of House Bill 2239 and calls for an exemption of customized computer programs from sales tax, similar to the law to this effect that was passed in California last year. [CW, Oct. 11].

"That you are seeing such legislation doesn't surprise me. With the cutbacks to

(Continued on Page 92)

	Company Car (Personal Use)	1st Class Air Travel	Spouse Travel	Annual Physical Exam	Financial Planning	Low Interest Mortgage Loan
Chief Executive Officer	63%	11%	11%	98%	28%	6%
Chief Operating Officer	37	10	-	89	33	6
Executive Vice President	64	9	18	55	45	8
Chief Financial Officer	37	3	3	54	23	3
Administrative Vice President	40	-	11	56	22	2
Chief Marketing and Sales Executive	58	8	-	33	25	8
Chief Human Resources Executive	40	-	7	53	33	7
Chief Engineering Executive	22	4	-	26	22	-
Chief Manufacturing Executive	23	4	-	38	27	4
Chief Products Development Executive	40	-	-	50	28	-

Source: Peat, Marwick, Mitchell

Most Frequently Offered Perquisites to New England High-Tech Executives.

New England Beats Sun Belt In Salary Survey

By Tom Henkel
CW Staff

BOSTON — New England high-technology firms appear to be countering the "sun and fun" lures of Sun Belt competitors with cold cash.

According to a recent survey of top executives in New England high-technology companies, pay increases in the Northeast rank about 4% higher than similar firms in the Southern states and on the West Coast. Conducted by Peat, Marwick, Mitchell & Co., the survey revealed New England high-tech executives received an average 13.9% pay increase in 1982. That compares

(Continued on Page 96)

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Fujitsu to Buy TRW's Share in TFC Partnership

• LOS ANGELES — Fujitsu Ltd. and TRW, Inc. have broken their three-year partnership in TRW-Fujitsu Co. (TFC). Both companies admit the joint venture did not work.

Fujitsu announced recently it will buy TRW's 49% control of TFC and continue to market the current 7880 line of point-of-sale terminals, the 8500 line of small business systems and Micro16 desktop microcomputers. Industry watchers have also speculated Fujitsu may use TFC as a springboard for independently marketing low-end mainframe processors. Fujitsu currently supplies processors for Amdahl Corp.'s IBM-compatible processor business.

While Fujitsu held the majority interest in TFC, TRW officials in the U.S. managed the firm. Fujitsu, however, was responsible for product development and integrating its products into the U.S. marketplace.

A TRW spokesman said TFC's biggest problem was its inability to communicate U.S. customers' needs to product developers in Japan. Some industry watchers added that cultural differences between the U.S. marketing and Japanese development operations caused friction within TFC. In any case, TRW said that the joint venture failed to produce a profit in its three-year stint.

TRW is expected to sell its interest in TFC, for an undisclosed amount, by the end of March. TRW will, however, allow three of its executives to remain as advisors, and TRW will continue to provide U.S. service for TFC products.

A TRW spokesman said Fujitsu is likely to change TFC's name after the sale is completed.

TFC is expected to maintain its Los Angeles offices and 375-employee staff.

AMI Lawsuit Charges IMP With Unfair Competition

By Patricia Keefe
CW Staff

SAN JOSE, Calif. — American Microsystems, Inc. (AMI) last month filed suit in Superior Court here against International Microelectronic Products (IMP), charging the firm with unfair competition, pirating employees and stealing trade secrets concerning AMI's buried diffusion process and computer-assisted design (CAD) software. No trial date has been set.

A subsidiary of Gould, Inc., AMI is seeking $1 million in actual damages and $10 million in punitive damages, as well as asking the court to impose a "constructive trust," whereby IMP would have to pay AMI any profits gained through the alleged use of AMI trade secrets.

'AMI is following a trend among larger companies to sue new ventures in order to "stifle the entreprenurial spirit" while tying up the start-up's resources in defending the suit.'

— George Gray, former AMI employee

AMI has charged that, in 1981, IMP "promptly began a practice, which continues unabated, of staffing IMP with key engineers, executives and employees from AMI ... most of whom were intimately involved in the development of the buried diffusion process in AMI's technical research and development department or in the use or development of AMI's CAD software."

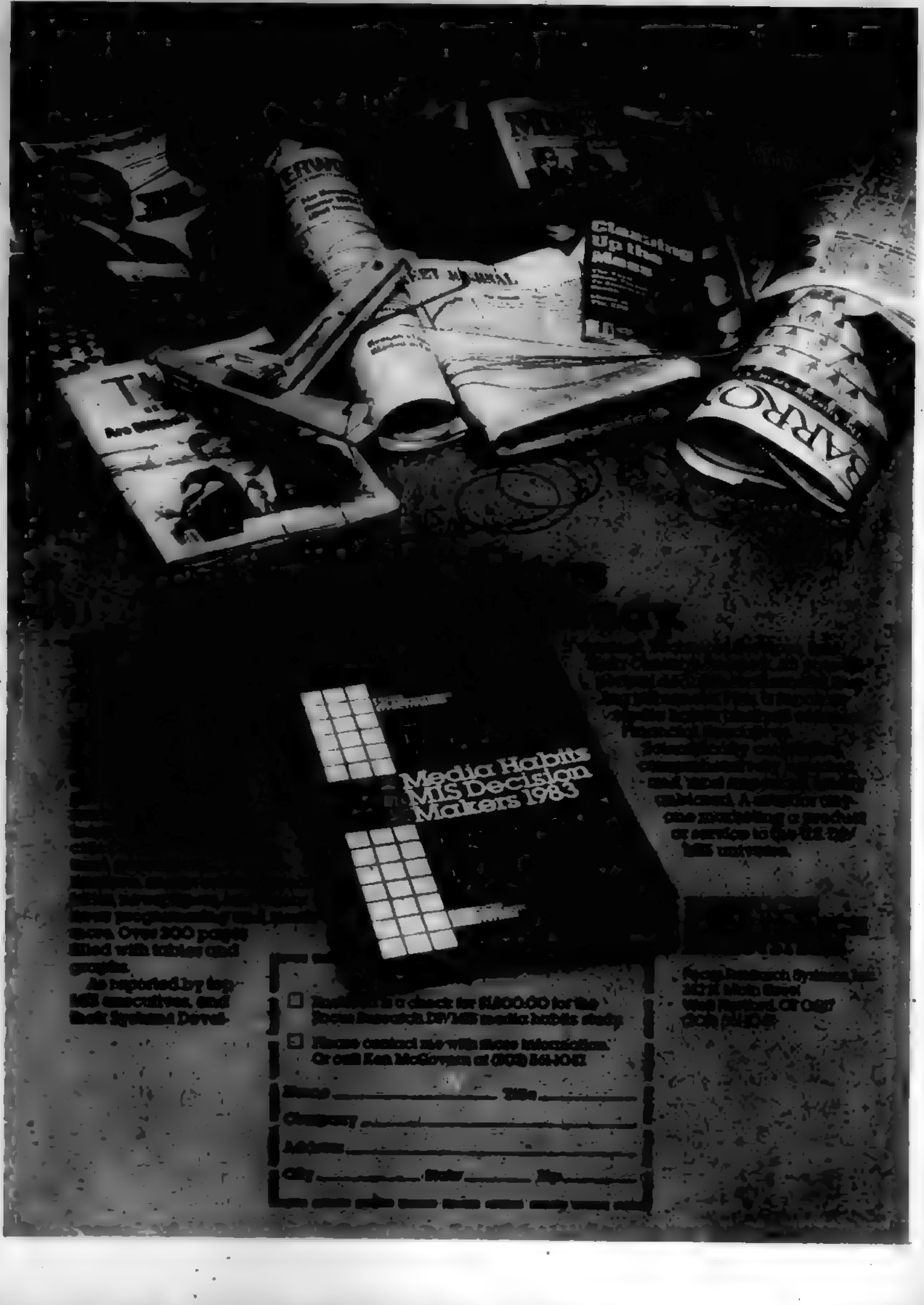
More specifically, AMI claims that a 64K-byte read-only memory (released in 1982) and the Impel Design System (released in January) developed by IMP are manufactured by making unlawful use of AMI's buried diffusion process and CAD software, which are alleged to have been "wrongfully transferred" to IMP by former AMI employees. AMI officials have refused to comment on the suit.

IMP is a two-year-old semiconductor manufacturer founded in January 1981 by two former AMI employees, George Gray and Zvi Grinfas.

In a release denying those allegations, Gray, now IMP's chairman, said the AMI lawsuit was "totally unjustified" and accused AMI of following what he calls a trend among larger companies to sue new ventures to "stifle the entrepreneurial spirit" while tying up the start-up's resources in defending the suit.

IMP officials dispute AMI's claim of having developed the theory of the buried diffusion process, claiming there is nothing new about the concept. Gray pointed to firms such as Texas Instruments, Inc., Rockwell International Corp. and Advanced Micro Devices, Inc. as examples of companies said to be either studying the concept or manufacturing products utilizing the technology.

Gray said that, of 136 staffers hired over the last 12 months, only 10 were from AMI.



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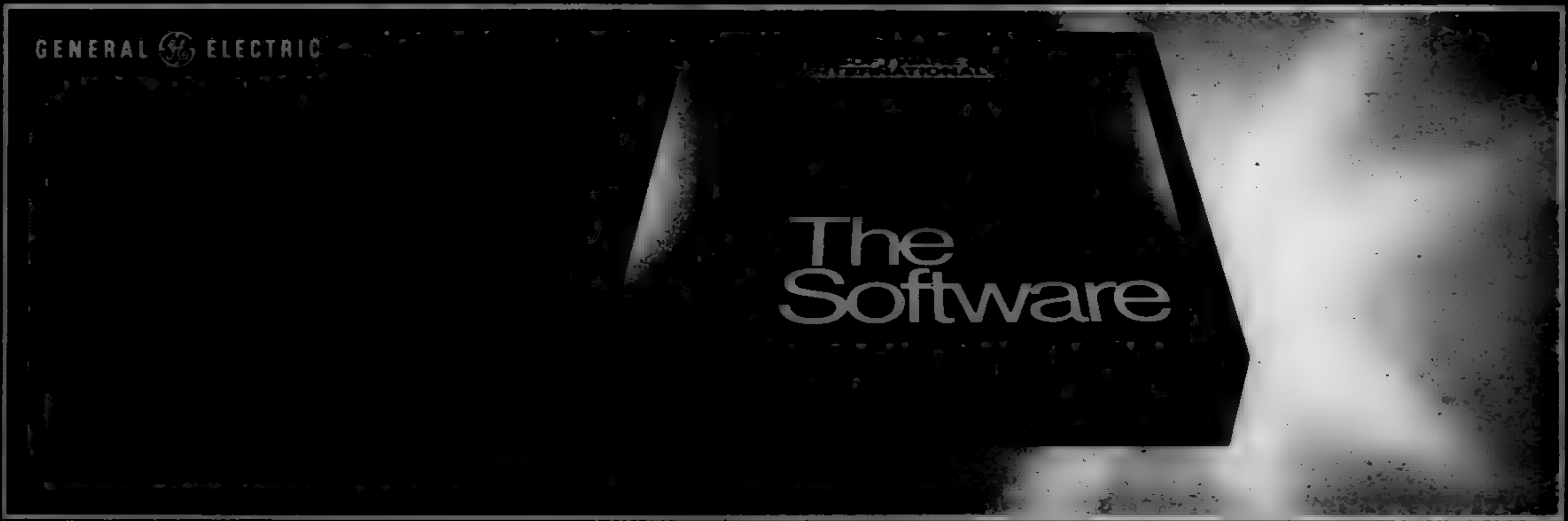

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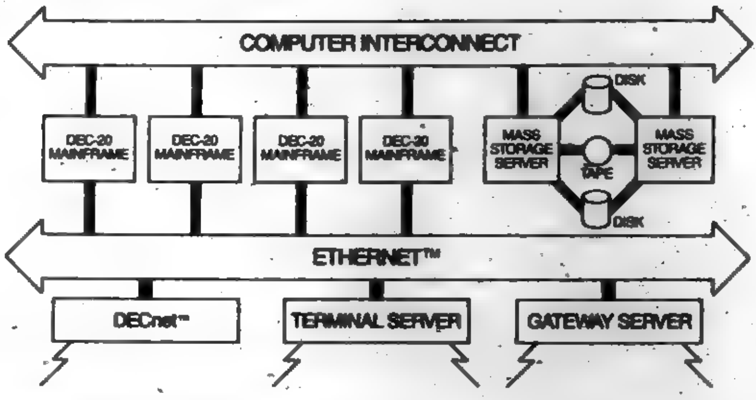

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Preliminary Ban Issued on Hubco MAI Upgrade

BOISE, Idaho — A Federal District Court judge here has granted a preliminary injunction stopping Hubco Data Products Corp. from selling software modifications for minicomputers manufactured by the Basic Four Information Systems Division of Management Assistance, Inc. (MAI).

In a long-running court battle [CW, July 19, 1982 and Nov. 15, 1982], MAI has charged Hubco with violating its software copyrights by selling a series of memory upgrade packages for Basic Four minicomputers.

The upgrades, according to a spokesman for MAI, make illegal modifications to the Basic Four Boss operating system and also to some of its Basic Business software.

Hubco maintains its enhancements do not make illegal changes to Boss.

The company also claims that Basic Four Business Basic packages are in the public domain and has charged MAI with violating federal antitrust laws by trying to stop Hubco's sales.

Pending the results of a scheduled May 9 hearing, Hubco is restricted from selling memory upgrades for Basic Four systems, according to Hubco President Tom Haycock.

The court's decision follows an earlier court ruling denying Hubco a preliminary injunction against MAI.

Mass., N.C. Bills Attempt to Tax Software

(Continued from Page 87)

federal aid to the states, a lot of states are in severe financial difficulty and they are looking to widen their revenue base," according to Ron Palenski, assistant general counsel for the Association of Data Processing Service Organizations, Inc.

Palenski said it is interesting that a state like Massachusetts feels the necessity to introduce legislation when it already has a regulation that calls for the taxation of software [CW, March 20, 1981]. He explained, however, that if the legislature enacts a statute that defines computer software as tangible, this would be more difficult to test than a regulation. "The only challenge you can make to that is that it violates the state constitution," he said.

Steve Vajda, chairman of the taxation task force for the Commission on Software Issues in the '80s, described the pending bills as part of "the backlash effect based upon prior decisions where software was ruled to be intangible and, therefore, not taxable. Rather than trying to put in a reasonable distinction between the kinds of software they are looking at, they are just saying software should be taxable."

Vajda admitted that the amounts of money that would be charged per company are not large, but "the problem is the precedent has been set, and it will be set all of the time unless it is contested." Citing the Data Processing Management Association's (DPMA) opposition to the matter, Vajda said this organization is "not opposed to taxation if it's reasonable and in line with other legislation and regulation. If they want a definition of software that will make sense, we can support the fact that pure copies of software off the shelf could be taxed. Anything dealing with any service applied to it whatsoever, however, should not be taxed. It should be part of the service industry approach."

"The 14th Amendment is supposed to protect us against arbitrary government action . . . I maintain it is unreasonable and irrational and a violation of the Fourteenth Amendment to call an intangible tangible," asserted Robert Sherin, nonjudicial legislative adviser for DPMA and a long-time opponent of taxation of customized computer programs.

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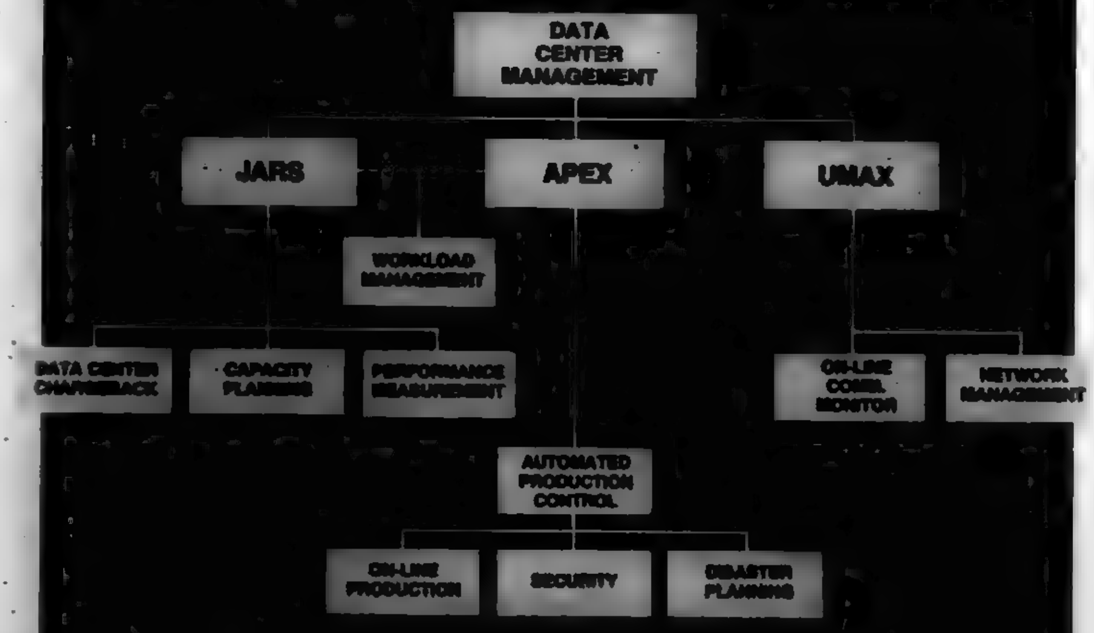

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Japan's Corporate-Government Policy Probed

(Continued from Page 87)

reversed a high-technology trade deficit and positioned the nation to enter a high-technology future:

The Commerce study extensively details the historical, legal and corporate development of Japan's broad computer and electronics industrial policy. Evolving through the last 10 years of government-directed R&D and marketing in this field, that policy now has reached maturity, as indicated in three major Ministry of International Trade and Industry (Miti) projects — the fifth-generation computer, supercomputer and semiconductor development plans — to which more than $700 million have already been committed through 1988-91.

Commerce does not minimize the competitive challenge U.S. firms face because of this policy implementation. But in general, the report indicated, Japan's corporate-government partnership is not the relentless menace American business executives often make it out to be.

Discussing the impediments to successful Japanese industrial policymaking, Commerce concluded: "The system has serious internal problems and external limitations. Several major issues regularly challenge those who design and assemble the various policy packages."

First, the report said, is that "an intense competition often existing between Japanese firms makes them reluctant to participate fully in an industrywide agreement or effort. This is especially true," Commerce said, "for companies that believe they are in a leading position.

This situation can make it particularly difficult to orchestrate interfirm cooperation when it involves sharing basic information, engineering accomplishments or top personnel. Secondly, corporations generally relinquish to the government as little control over their activities as possible — whether it be financial, administrative or substantive."

In addition, Commerce said, "the future effectiveness of Miti development policies will be hindered to the extent that the complex interdependence between Japanese industries, government agencies and other organizations restricts flexibility in meeting new developments.

"Furthermore, reaching an effective consensus on industrial policy will be increasingly complicated by Japan's dependence on foreign natural resources and Japan's international trade and investment relationships," the report said. Although Japan's computer industry is not hindered by natural resource problems, Japanese firms are becoming increasingly entangled in joint R&D and marketing agreements with American firms, which theoretically could lessen their allegiance to government-directed programs.

Finally, Commerce said, "industrial policy formulation faces the risk of incorrect choices — picking the wrong sectors for expansion or construction."

NTT Unveils Plan for U.S.

NEW YORK — Nippon Telegraph & Telephone (NTT) public corporation of Japan has announced an eight-point initiative designed to speed up American sales in Japan's telecommunications equipment market. The plan will begin immediately, according to an NTT spokesman.

NTT will now accept applications in English and in its New York office and extend application deadlines. It will also improve the flexibility of its product requirements, respond faster to sales possibilities and make simultaneous announcements of product requirements in the U.S. and Japan.

The improvements should increase competition and speed up the contractual process, a U.S. Trade Representative Office official said. It will also lead to greater sales of U.S. telecommunications equipment to NTT, the official said.

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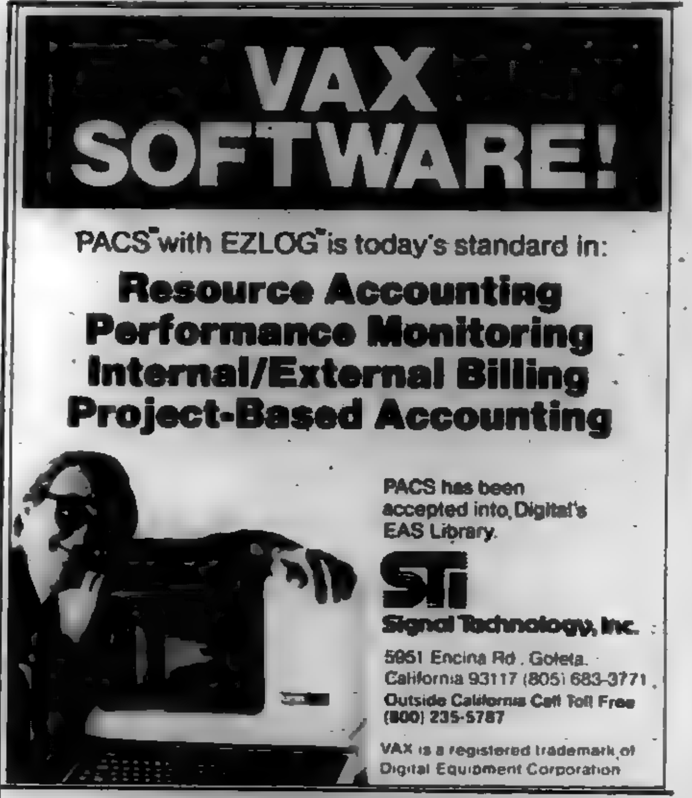

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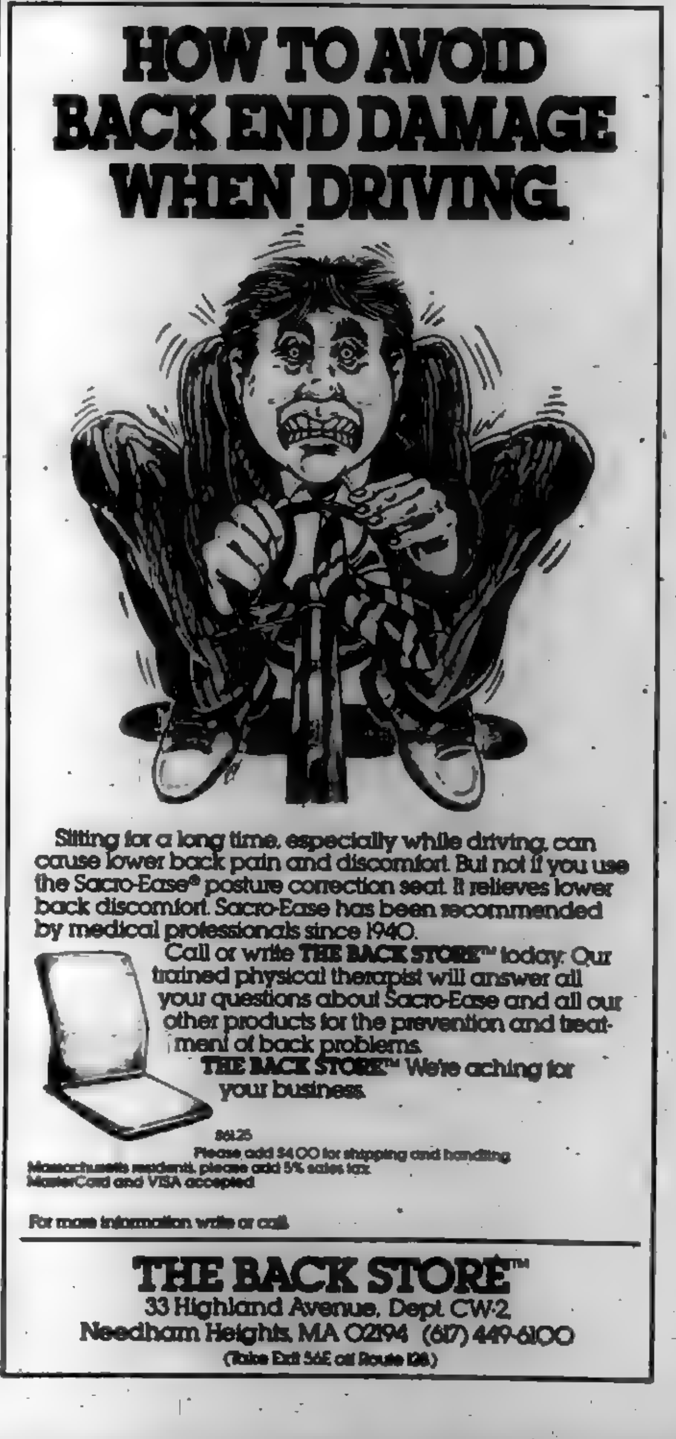

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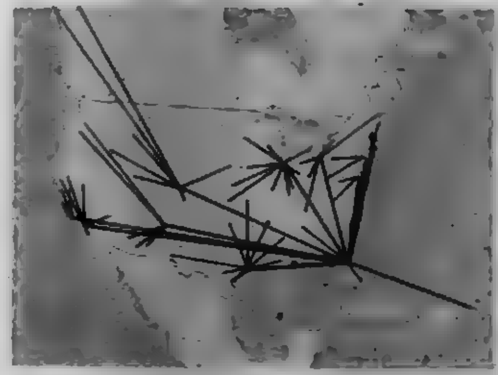

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New England DP Firms Luring Execs With Cold Cash

(Continued from Page 87)

with about a 10.7% increase for Southeast high-tech executives and approximately 9% for executives in California's Silicon Valley, according to Donald T. Sagolla, manager of Peat, Marwick, Mitchell's human resource consulting service.

In addition, New England executives will probably receive larger pay increases in 1983. The survey estimated the average pay increase would be 10.9%, as compared with about 9% in other parts of the country.

For the most part, Sagolla said, New England appears to have escaped the most severe ravages of the recession. Even better news for those in New England is the area may never feel the full pinch of the recession, Sagolla said.

What are New England high-tech firms doing right? Sagolla said there are several factors.

"We're either a lot luckier than most or more proactive," Sagolla said, adding that New England high-tech firms appear to be using salary bonuses and short-term incentive plans more effectively than other geographic areas.

For example, the Peat, Marwick, Mitchell report noted that 82.5% of the companies surveyed said they offered incentive bonus programs to their executives. Of that percentage, 54% said they made bonuses available to all executives, and 42% said only selected executives were eligible for bonuses. Four percent of those polled did not indicate who was eligible for a bonus, according to the report.

The approach appears to work. Sixty-five percent of the firms granting above-average pay increases showed above-average performance, the report noted. In addition, New England firms appear to concentrate more heavily on planning and managing sales growth than on long-range strategic and financial planning.

Ironically, however, the study concluded that relatively few companies in the start-up or growth stages used short-term bonus compensation as a tool to boost productivity. As one participant in the firm's survey noted, "Initially, we intend to conserve cash and provide all employees with a significant equity position. In the future, we will pay necessary salaries to enable us to hire the 'best' people. The stock ownership motivates [the executives] to build a substantial company."

A company car or annual physical exam were the most popular perquisites offered to high-tech executives.

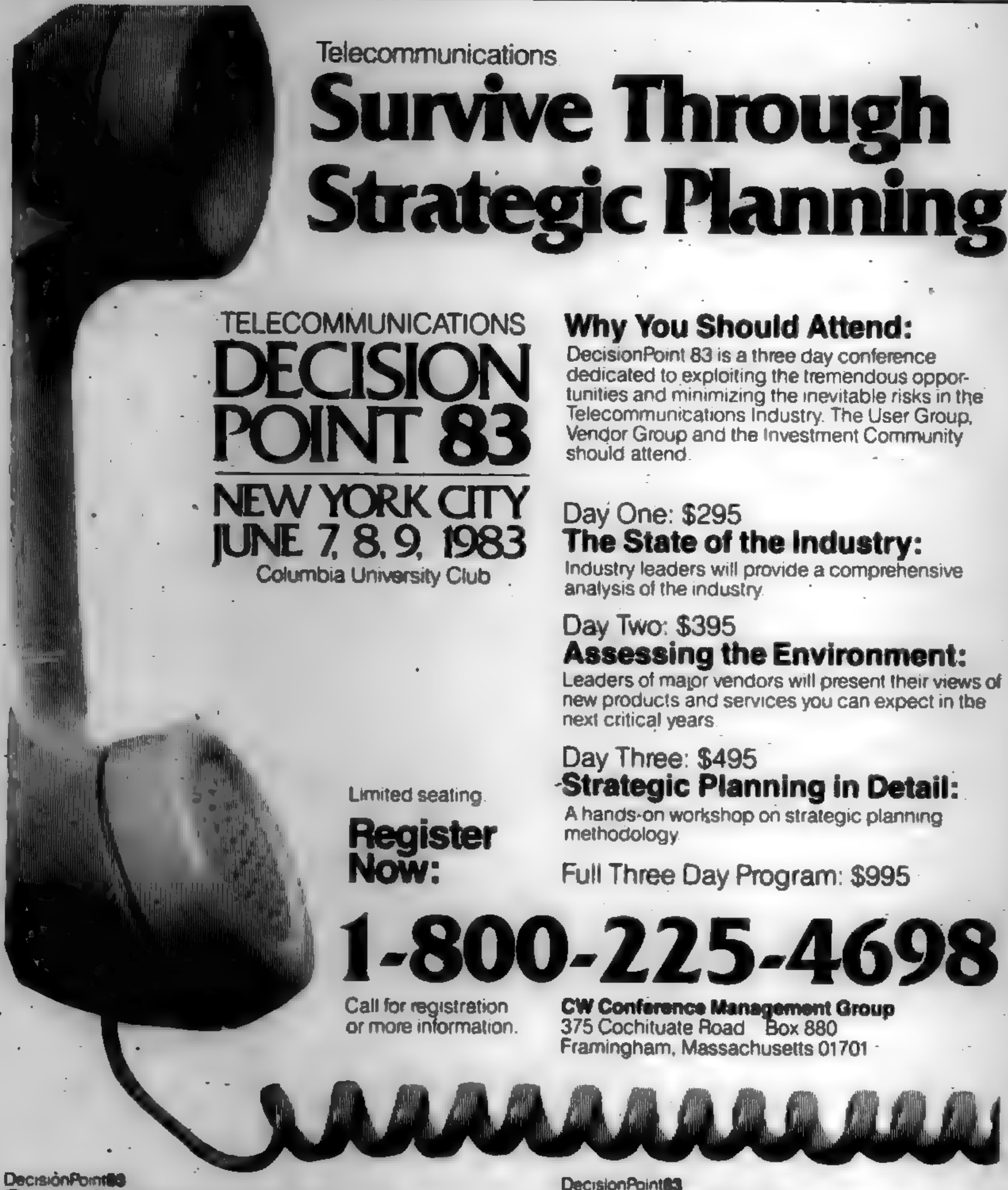
The Peat, Marwick, Mitchell report is free from the firm, which is located at One Boston Place, Boston, Mass. 02108.

Manufacturers Reach Standard Agreement

SANTA BARBARA, Calif. — A group of industry manufacturers reached final agreement on a proposed recording-format standard intended to permit interchange of recorded media for streaming ¼-in. cartridge tape drives.

The proposal, designated QIC-24, was established at a meeting of the Working Group for Quarter-Inch Cartridge Drive Compatibility (QIC). The six QIC members who voted unanimously in favor of QIC-24 are Archive Corp., Cipher Data Products, Inc., Data Electronics, Inc., Qantex Division of North Atlantic Industries, Inc., Tandberg Data A/S and Wangtek.

Further details on the proposed standard may be obtained from Freeman Associates, 311 E. Carrillo St., Santa Barbara, Calif. 93101.



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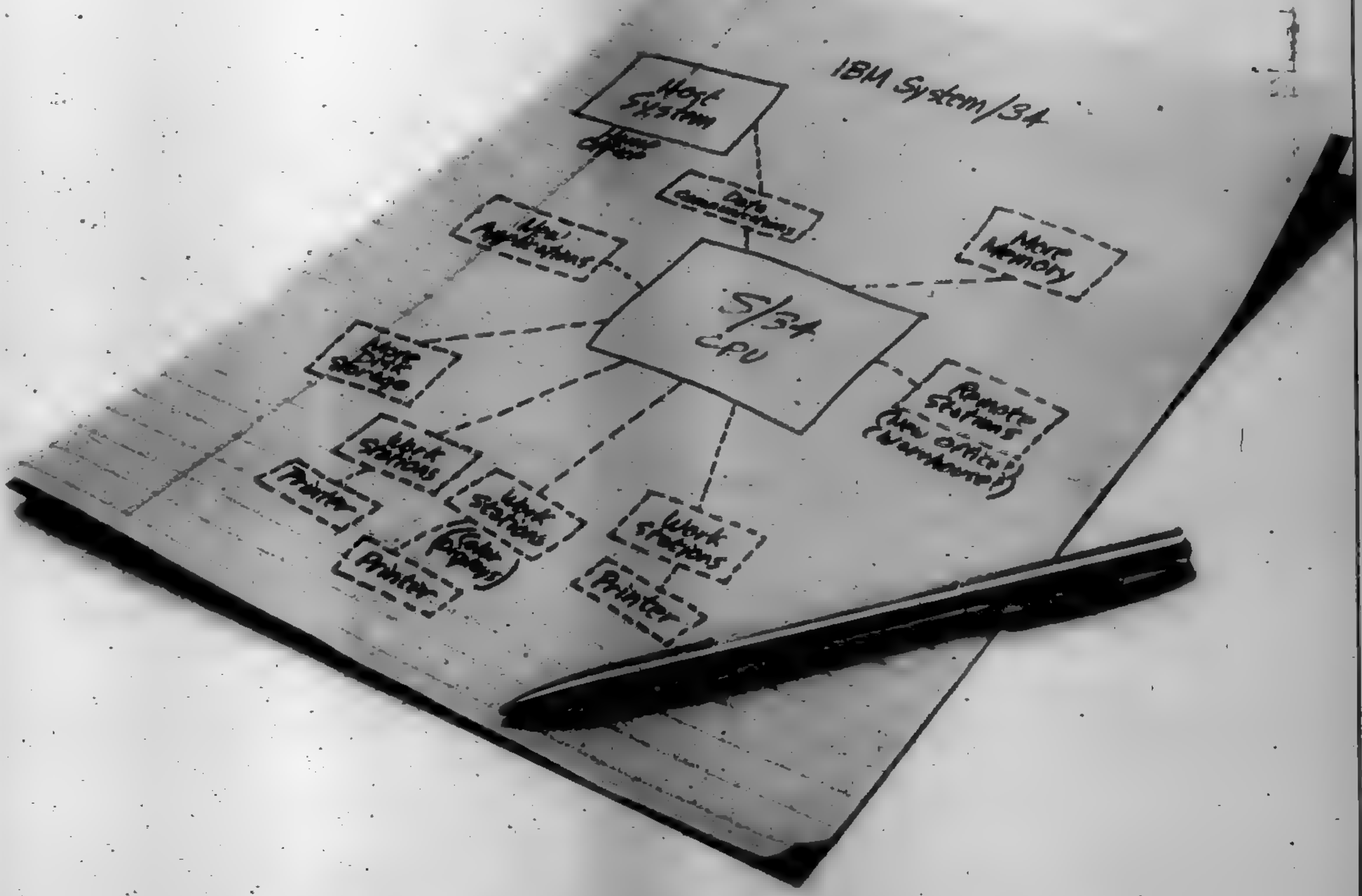

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To Global Alliances, Economic Development
Protectionism to Foster High Tech Seen Threat

By Jake Kirchner
CW Washington Bureau

ROTTERDAM, The Netherlands — The head of the Organization for Economic Cooperation and Development (OECD) warned recently that trade protectionism to foster high-tech industries threatens global alliances and economic development within individual nations.

The efforts of countries to protect their emerging high-tech industries through government support of research and development and through various barriers to trade with competing nations are making the development of high technology "a divisive issue in the trade field," OECD Secretary-General Emile van Lennep said in a March 4 address here to the American-European Community Association.

Noting that high technology is "a sensitive issue in Europe's relations with both the U.S. and Japan," van Lennep said, "The recent intensification of problems related to trade in high-technology products stems from the role governments assign to key technologies and science-based industries in revitalizing their economies and strengthening their overall competitiveness."

Trade Wars

In both the U.S. and the European community, growing protectionist sentiment within national governments threatens to spur trade wars in important trading commodities. Although the protectionism was initially aimed at supporting native agricultural and heavy manufacturing industries, some business executives and government officials fear it could spill over into increasingly important high-tech sectors [CW, Dec. 27/Jan. 3].

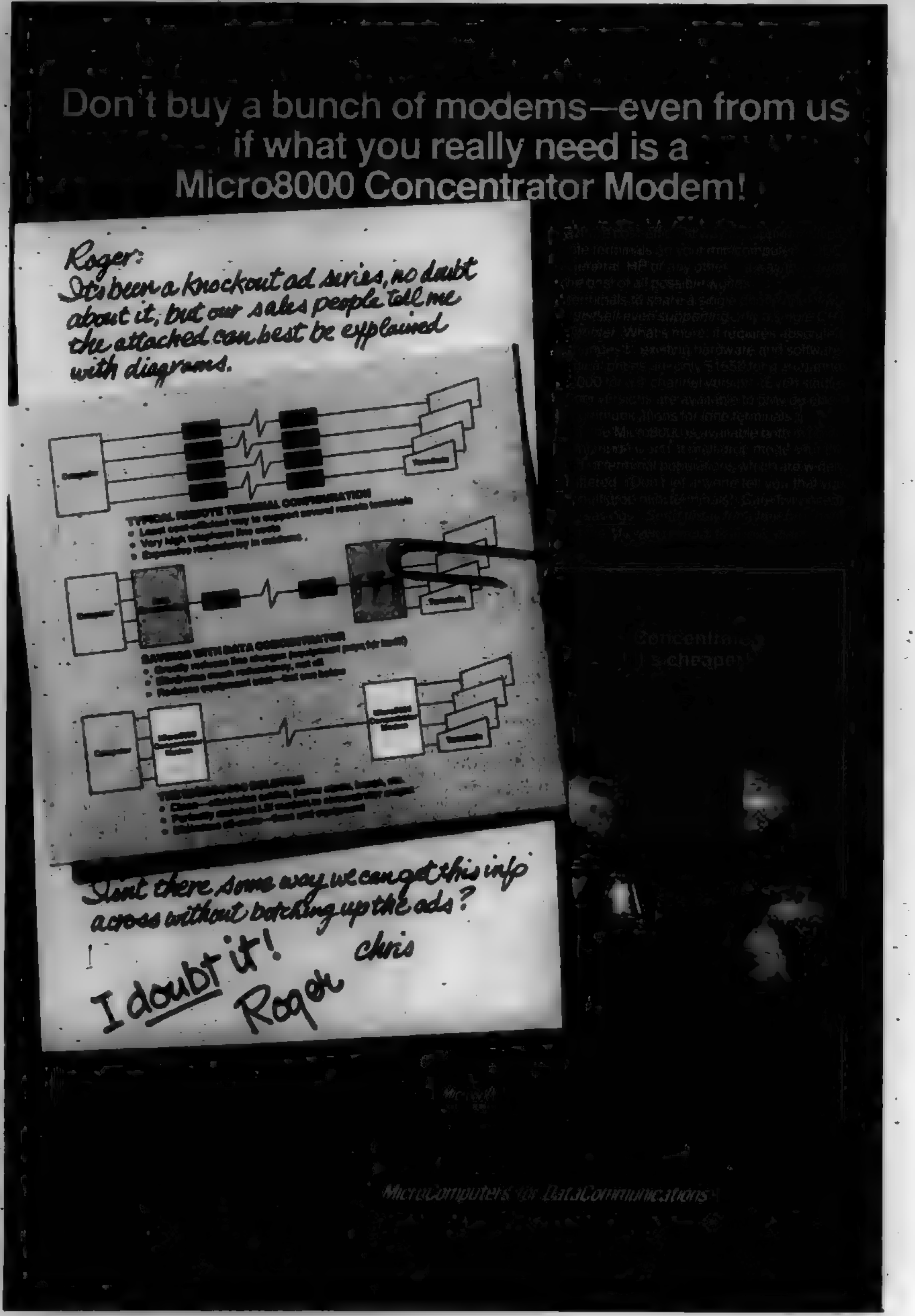
OECD is currently looking into the growing problem of high-tech protectionism and possible solutions. OECD includes 18 European countries and the U.S., Canada, Japan, Australia, New Zealand and Iceland.

Discussing in general what he termed the "new and disquieting momentum" of protectionism throughout the world, van Lennep observed that "protectionism has become a somewhat loaded concept with ample room for misunderstanding. Current policy statements have a tendency to characterize protectionism in terms of actions by other countries and rarely, if ever, by one's own."

While "it is inevitable that the prolonged period of low growth and rising unemployment should have led to an increase in protectionist pressures," van Lennep said "the most telling arguments against protectionism are not only the traditional ones, referring to internationally agreed rules and the danger of retaliation but, more importantly, evidence that protection, particularly in its more subtle forms, is bad for the economy of one's own country.

"Protectionist measures, by locking resources into declining activities, weaken the capacity of adjustment of an economy and make it more inflation-prone," he said.

"In broad terms, protection is always a redistribution of income inside a country and not from one country to another. Almost by definition, the beneficiaries of protection are existing enterprises and activities, at the expense of others that might emerge tomorrow," he said.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BEI Chief Found Guilty Of Theft From Nixdorf

By Patricia Keefe
CW Staff

CAMBRIDGE, Mass. — A used computer sales and scrap company and its president, a former Nixdorf Computer Co. employee, were found guilty recently in Superior Court here of conspiring to steal computer equipment from the Nixdorf Computer Corp.

BEI, Inc. President Arthur S. Greenberg faces a maximum of five years in prison. Both Greenberg and his firm could be fined up to $5,000 as well.

Allan T. Greenberg, Arthur Greenberg's brother and a codefendant, was found not guilty. As BEI treasurer, Allan Greenberg sold used equipment and signed many payoff checks made out to George Zenisek, a former manager of Nixdorf's refurbishing department, the prosecution charged. Zenisek, the prosecution's star witness, was also indicted, but swapped a guilty plea and his testimony for recommendation of a suspended sentence.

Another defendant, Michael McGibbon; a former Nixdorf employee who the prosecution said moonlighted for BEI, is awaiting trial.

Defense attorneys attempted to build a case around what they alleged to be Nixdorf's vague and loose equipment scrapping policies, poor record keeping by prosecution witnesses and improper behavior on the part of Nixdorf officials in helping Massachusetts State Police with the search and seizure of equipment from BEI in August 1981.

About $5 million worth of computer equipment was found at the Computer Corral, BEI's retail site, as a result of those warrants; most of the equipment was manufactured by Nixdorf and at least $1 million of it was thought to be new equipment, according to testimony.

In addition to the criminal case just concluded after 14 days of trial, Nixdorf had also filed an as yet unresolved civil suit in August 1981 against the same three defendants and two other alleged coconspirators: Shirley Greenberg, Arthur's wife and a former Nixdorf employee and her supervisor, Zenisek, who is charged with rigging bids and throwing usable components into the scrap piles. The civil suit charges the defendants conspired to steal computer parts valued between $1.5 million and $7 million.

The civil and criminal charges are the result of a four-month sting operation launched in the spring of 1981 by Nixdorf with the aid of First Security Services Corp. (FSS) of Boston, a private investigation firm. Evidence compiled from warrants executed by Massachusetts State Police also contributed to the charges.

BEI, Inc. is a company that bids on equipment scrap piles and refurbishes used equipment for sale at the Computer Corral and via mail order ads.

Between July 1980 and August 1981, BEI won 35 bids from Nixdorf's refurbishing department. BEI also paid Zenisek about $29,000 for rigging bids and adding, against Nixdorf policy, new and working computer components into scrap piles, according to testimony.

Nixdorf first became aware of irregularities in the refurbishing department at their North Reading, Mass., warehouse in March 1981 after receiving several anonymous telephone calls charging that equipment was being stolen. As a result of those calls, Nixdorf called in FSS to work with the corporation's security force. Armed with what FSS Vice-President Lawrence T. Curran characterized as very detailed information from the anonymous tipster, a subsequent investigation pointed toward BEI and its officers as likely suspects.

At this point, FSS put its sting operation into action. It set up a dummy corporation entitled BC Associates, complete with Nixdorf computer equipment. Investigators posing as company officials then went to the Computer Corral and inquired about the availability of Nixdorf parts.

Sting Method Gaining Favor

BOSTON — Nixdorf Computer Corp. has paid First Security Services Corp. (FSS) of Boston about $70,000 so far to recover stolen computer equipment valued up to $7 million.

FSS Vice-President Lawrence T. Curran said he has investigated several cases of computer theft and is beginning to see changes in the attitude of corporations toward security issues.

"Nixdorf and all the other computer companies that I have dealt with have difficulties in tracking their equipment," Curran said. "You have to understand that the emphasis is on manufacturing and sales operations, not security." But Curran sees this attitude changing as a result of widely publicized cases such as the IBM/Hitachi Ltd./Mitsubishi Electric Corp. trade secret theft.

When theft is suspected, one way of ferreting out suspects is via the "sting," a method of going undercover that has gained popularity.

In the case involving Nixdorf and BEI, Inc., a computer salvage firm (see related story), a dummy corporation was established and supplied with a working Nixdorf system. FSS investigators were trained on the equipment prior to the operation's start-up, according to Curran.

Since Massachusetts law requires consent prior to taping conversations, the FSS team was forced to rely upon videotapes of meetings, written notes and reports following critical meetings with BEI principals and testimony taken from a Nixdorf refurbishing manager.

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HP Group Aims to Increase Business Micro Sales

By Robert Batt
CW West Coast Bureau

SUNNYVALE, Calif. — A significant increase in the sale of business application microcomputers is a major priority for Hewlett-Packard Co.'s recently formed Personal Computer Group, company executives have revealed.

Cyril Yansouni, group general manager, said HP will be developing a more integrated product strategy in an attempt to gain greater penetration of the distributed data processing and business applications market.

"Our aim is to provide more total solutions," Yansouni said. "In the past, we have been primarily a company catering for hardware and data processing tools. Now we are moving to provide more complete software as well. For example, we are opening up our products so that third-party software for our personal computers can be developed."

Because of HP's experience in manufacturing applications, much of its market share to date in personal computers has been in the technical and scientific fields, rather than business applications, Yansouni said. About 70% of HP's personal computer sales are estimated to be in the hands of technical and scientific users, the remainder in business applications. The HP 120 desktop computer and the HP 75 portable system will be the leaders in HP's more aggressive marketing in business computing, company officials said.

In expanding sales of personal computers for business applications, Yansouni argued it was important to sell direct to both management information systems directors and end users. "You need a good distribution strategy to be successful. You have to create an awareness of your product not just in the company's data processing department, but also with the individual end user. The end user thinks both as a company professional and as a consumer. You need to appeal to both," he said.

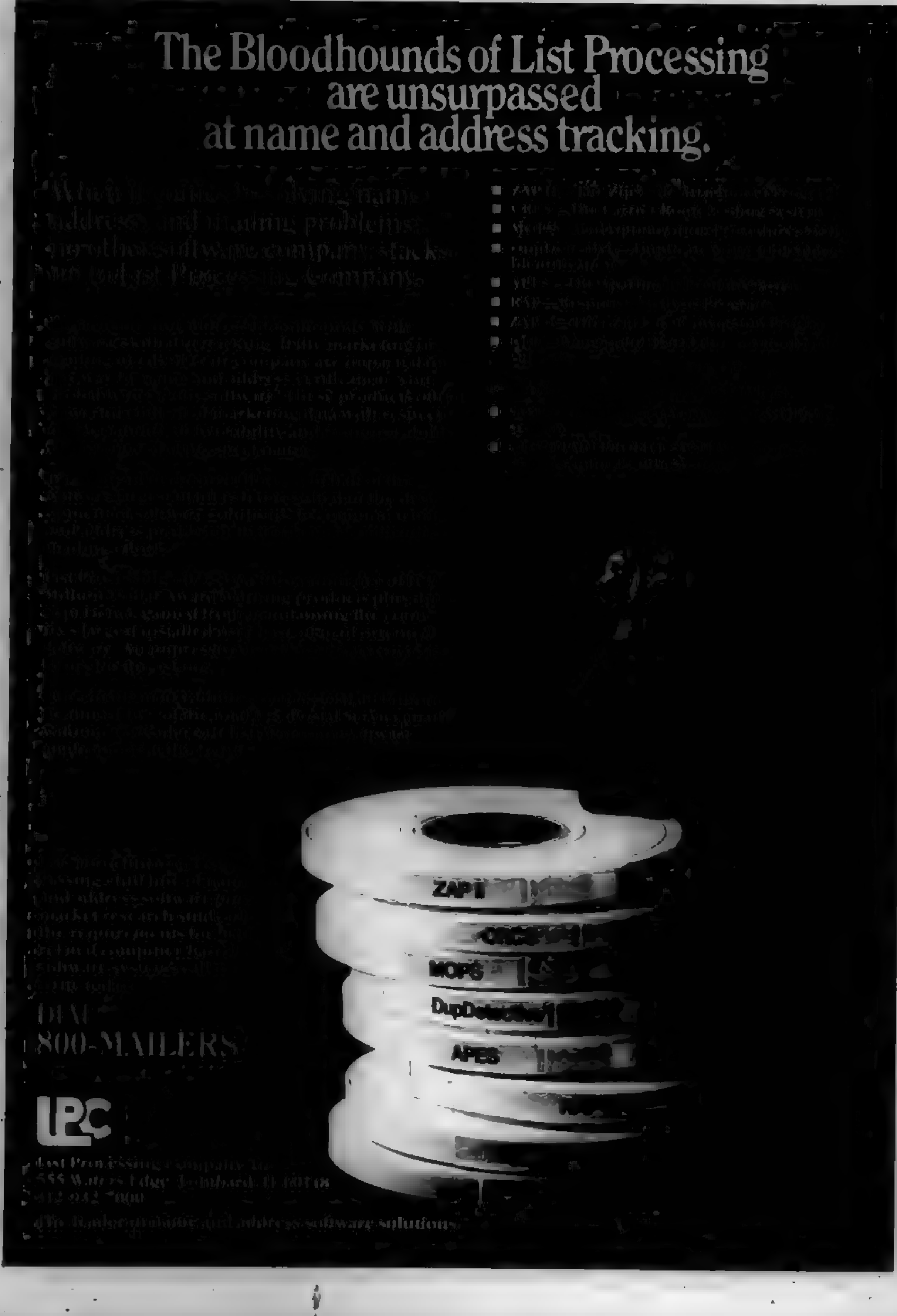
According to Richard Love, HP's newly appointed manager of manufacturing operations for the Personal Computer Group, HP intends to build an integrated distribution system that will allow delivery of all components of an executive workstation to the end user in one package.

Currently different manufacturing plants are responsible for delivering separate peripheral equipment such as printers, plotters or software manuals, and, Love said, users have complained that such a distribution system does not satisfy their needs.

"Our aim is to appear to the end user as one company, not as eight different divisons. We want it to be transparent to the user where we invent or build something connected with a personal computer," he explained.

On another subject, Yansouni said industry standards are becoming increasingly important regarding personal computers because users are demanding them. In this sense, IBM's role in the personal computer sector has been significant due to the variety of third-party software available for use on its personal computer.

"In looking at the question of standards you have to recognize that personal computers are information tools. Therefore, what you really need is communications standards, not just in data, but also in voice, text and images. Anything that helps to standardize all those elements will significantly strengthen the growth of the personal computer market," he added.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EDP News Restructuring DP Publications

ANNANDALE, Va. — EDP News Services Inc., 25-year-old publisher of computer industry newsletters, is putting the finishing touches on a major restructuring of its publications.

Published under the *Computer Age* banner, the firm's newsletters — covering software, peripherals, data communications, mini/microcomputing, electronic funds transfer, world trade, federal computer procurement and computer crime — are now devoted solely to news analysis.

"The goal is to make all the publications original research and analysis, period," Editor Daniel Casolaro said. EDP News is completing arrangements with experts in various DP fields to provide that analysis, he said. The editorial content of "Computer Crime Digest," for example, is under the direction of Jay Bloombecker, executive director of the National Center for Computer Crime Data, Los Angeles.

General DP indusry news is available through the firm's "Computer Daily" newsletter and a news roundup publication, "EDP Weekly," which has been in existence since 1960. The company is also considering on-line publishing, Casolaro said.

The firm is offering package discounts for subscribers to multiple newsletters. Subscriptions to the analysis publications range from $98 to $150 a year. EDP News Services, Inc. is at 7620 Little River Turnpike, Annandale, Va. 22003.

Wants IDX Sale Prohibited

Rolm Files $100 Million Lawsuit Against Plessey

SAN FRANCISCO — Rolm Corp. has greeted the unveiling of Plessey Telecommunications, Ltd.'s IDX digital private branch exchange with a $100 million lawsuit accusing the British concern of misuse of Rolm technology and copyrighted software in the development of IDX.

More specifically, the suit charges Plessey with unfair competition, breach of contract, misappropriation of trade secrets and copyright infringement.

In the suit filed in U.S. District Court here last month, Rolm is asking the court for relief in three areas, according to spokesman Chris Stanfield:

- An injunction prohibiting Plessey from selling IDX.
- Actual damages resulting from any profits Plessey may have gained through the use of Rolm technology or software or the sale of any product based on that technology.
- Punitive damages of $100 million.

Plessey obtained access to the Rolm technology in question via software agreements executed in 1976 and 1977, which expired Feb. 15, Stanfield alleges. Under that agreement, Plessey had been using Rolm technology to manufacture and market its PDX system, a modified version of Rolm's CBX product. That agreement reportedly required Plessey not to use, disclose to or assist others in using the technology for a period of five years after the dissolution of the agreement. The IDX is said to be a replacement for the PDX.

According to court documents, "The IDX . . . is a derivative product which could not have been designed or developed and cannot be manufactured without the use of Rolm technology and software."

The suit further charges that the IDX is the only exchange other than Rolm's CBX to use a universally available parallel digital bus as a switching element and that is capable of selecting the most cost-effective trunk lines available for long-distance calling. Also, both exchanges use error-correcting random-access memory.

Rolm's charges "are totally without foundation," according to Plessey spokesman Warren Sinsheimer. In a prepared statement, Plessey claimed it has its own digital expertise and applied that knowledge to the in-house development of the IDX. Also, Plessey said the Rolm suit would not interfere with plans to manufacture and market the IDX.

Electronic Business Section At Gould Restructured

ROLLING MEADOWS, Ill. — Gould, Inc. has restructured its Electronic Products business section in line with a recent decentralization move.

The Instruments Division has become two new divisions: Recording Systems and Design and Test Systems. Worldwide product specification and marketing responsibilities for the Design and Test Systems, Recording Systems and Power Conversion divisions have been realigned. Power conversion products have been consolidated within Gould's Power Conversion Division.

In addition, four management appointments have been announced. James E. Forrest has been named president and general manager of the Recording Systems Division, and Patrick J. Tierney has been named president and general manager of the Power Conversion Division. Martin J. Weisberg has been named president and general manager of the Design and Test Systems Division, and Alan C. Mansfield has been appointed vice-president, administration of European operations.

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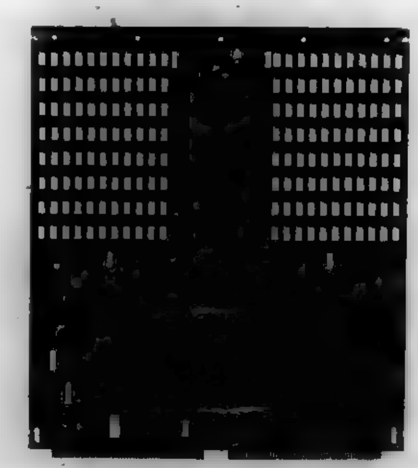

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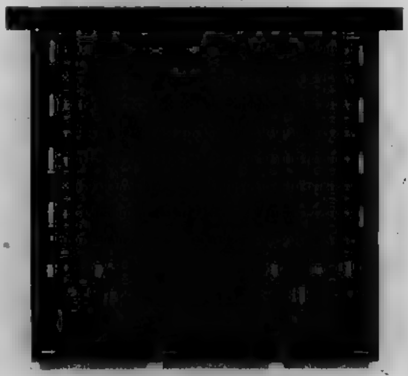

The WANG VS-90 and VS-100 Memory Card with 1MByte Capacity and ECC.

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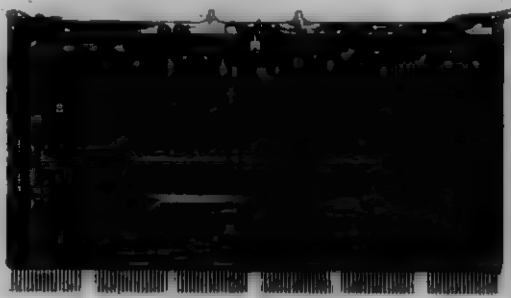

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Forecasts & Findings

Retailer DP Spending Up

Participating retailers spent a total of $271 million on data processing operations and programming during 1981, representing an increase of more than 8% over the previous year, according to the first annual **Survey of Management Information Systems Expenses**, by Arthur Young & Co.

The study further indicates that retailers allocated a total of 22% of the amounts budgeted for management information systems to the development of new computer systems. These figures reflect a trend toward large-scale system implementation, according to the vendor. Retailer interest is seen moving toward integrated systems rather than standalone modules.

The report is free of charge, according to a spokesman from Arthur Young & Co., 277 Park Ave., New York, N.Y. 10172.

Switches Mart Growing

The market for push-button and keyboard switches in Western Europe will each grow 11% per annum through 1987, outpacing other types, according to **The Switches Market in Europe**, by Frost & Sullivan, Inc.

These two categories, along with microswitches, will be largely responsible for keeping the total switch market advancing at an average rate of 5% a year during the forecast period, the report said. The total European market is at $1.8 billion in 1981 and is expected to reach $2.4 billion by '87. In contrast, the markets for rotary and thumbwheel switches are expected to decline. A predicted marginal growth rate for toggle, lever and rocker switches is said to reflect a trend away from all three types to the use of push buttons.

The study, No. E572, costs $1,600 from the vendor, located at 106 Fulton St., New York, N.Y. 10038.

USC to Emerge as Spoiler

United Satellite Communications, Inc. (USC) will probably emerge as "the spoiler" in the U.S. direct broadcast satellite (DBS) service, preempting a largely rural market that had been targeted by Communications Satellite Corp. (Comsat) and other companies, according to **The Video Technologies**, by The Yankee Group.

A USC/General Instrument Corp. (GI) initiative will probably be the catalyst for an industrywide scaling down of DBS from the 200W power level to the 4W to 100W range, which the report said will prevail as a "medium power" industry standard for DBS. The predicted scenario for the DBS market sees early entry by GI/USC in 1983, followed by Comsat, RCA Corp. and perhaps other companies advancing their schedules somewhat to put up with competing systems by 1985 or '86. Programmers adopting DBS as a delivery medium during this time frame may include CBS, NBC and ABC, according to the report.

The report is available to subscribers of the Home of the Future Planning Service, which sells for $11,500. More information is available from The Yankee Group, located at 89 Broad St., 14th Floor, Boston, Mass. 02110.

Services Demand to Grow

The demand for U.S. computer services — including data processing and professional services, software products and turnkey systems — is expected to grow fivefold between now and the mid-1990s, according to **Computer Services**, by Predicasts, Inc.

The report predicts that by 1985, the computer services volume of $36 billion will be 1½ times that of computer hardware and will increase further to 2½ times ($100 billion) by 1995. Data processing's share of the market is expected to shrink from a level of 71% in 1981 to 42% in 1985, while revenue will climb from $9 billion to over $15 billion during the same period. By 1995, DP will account for 33% of the computer services market or $33 billion in volume.

The report, Industry Study No. E74, costs $1,095 from Predicasts, 11001 Cedar Ave., Cleveland, Ohio 44106.

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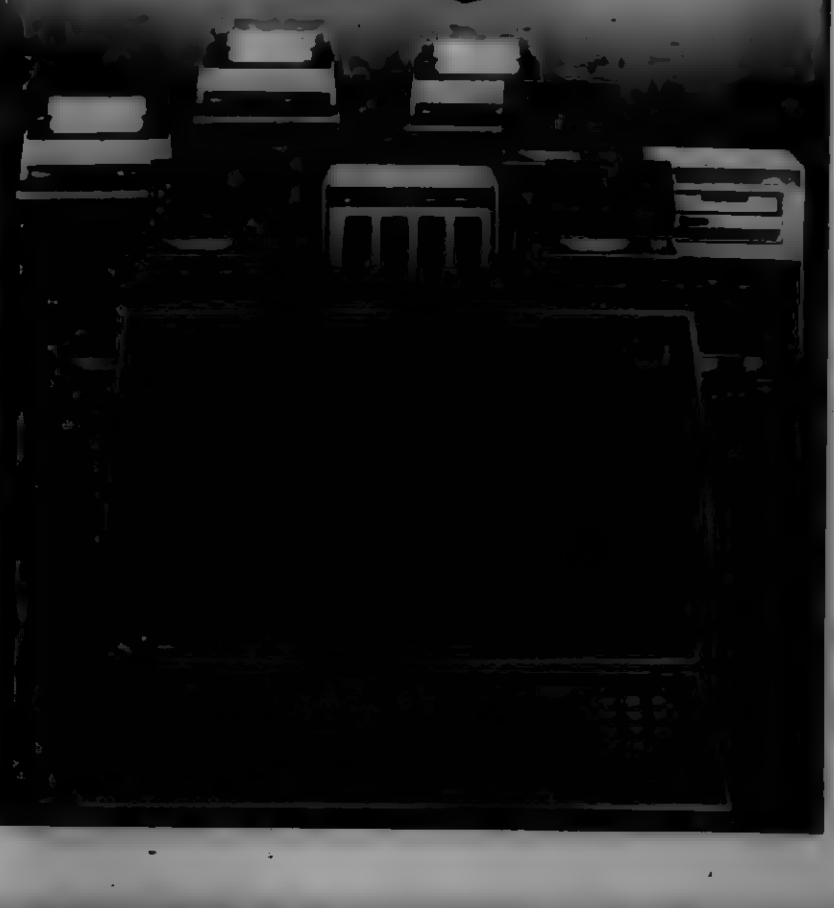

Nickels & Dimes

Decision Data Computer Corp. has reported a 48% increase in revenues and an 85% increase in net income for the fiscal year that ended Nov. 30, 1982. The company reported revenues of $74,319,000, compared with $50,101,000, and net income of $3,809,000 or 57 cents per share, compared with $2,055,000 or 37 cents per share for the same period in 1981.

$ $ $

Hewlett-Packard Co. has announced a 13% increase in sales and a 16% increase in net earnings for the first quarter of fiscal year 1983, which ended Jan. 31. Sales totaled $1.06 billion, compared with $936 million for the same period of fiscal year 1982. Net earnings amounted to $85 million or 67 cents per share, compared with $73 million or 59 cents per share.

$ $ $

Comdisco, Inc. has announced net earnings of $12,531,000 or 93 cen per share for the first quarter of fisc 1983, which ended Dec. 31, 198 These figures represent increases 30% and 23%, respectively, over th same period last year and are th highest quarterly earnings ever r corded by Comdisco, according to company spokesman.

$ $ $

Paradyne Corp. has reported revenues for 1982 of $207,341,000, a 49% increase over 1981 revenues of $139,023,000. Net income in 1982 was up 47% at $26,872,000, compared with $18,261,000 for 1981, and earnings per share increased 33% — from $1.40 per share to $1.86 per share — for the same period.

$ $ $

Cullinet Software, Inc. (formerly Cullinane Database Systems, Inc.) has announced revenues for the three months ending Jan. 31, 1983 increased 62% to $20,905,000, compared with $12,925,000 for the same period last year. Net income for the quarter was $3,025,000, a 51% increase over last year's $2,007,000. Earnings per share, adjusted to reflect a two-for-one stock split, rose from 15 cents to 21 cents.

$ $ $

Integrated Software Systems Corp. has filed a registration statement with the Securities and Exchange Commission covering a proposed initial public offering of 1,401,500 shares of common stock.

Super Shorts

The **IBM** Personal Computer is now being marketed abroad in 16 countries throughout Europe, the Middle East and the Far East, IBM subsidiaries have announced. The Personal Computers sold abroad will be supported and serviced by local IBM marketing organizations and IBM product centers, as well as by selected Personal Computer dealers. Initial shipments of the Personal Computer will be made from IBM's manufacturing facility here, with subsequent production for Europe and the Middle East from the company's factory in Greenock, Scotland.

• • •

Wicat Systems, Inc. plans to market a new GSA-certified high-level Cobol compiler on a Motorola, Inc. 68000-based system.

• • •

Digital Equipment Corp. has signed an agreement with **Polygon Associates, Inc.** of St. Louis to market and distribute Polygon's communications software, Poly-XFR, a file-transfer package that allows DEC's CP/M-based personal computers to communicate with other DEC computer systems and with non-DEC personal computers.

• • •

United Telecom Communications, Inc. will use **Micon Systems, Inc.'s** microprocessor-based packet assembler/disassembler as its standard means of connecting terminals to its Uninet service.

• • •

Hewlett-Packard Co. has established a service program that enables dealers to provide full hardware support for customers and allows customers to have increased local access to repair services. The service includes telephone technical assistance with specified response time.

• • •

Management Science America, Inc. (MSA) has selected four microcomputer hardware manufacturers — IBM, Hewlett-Packard Co., Zenith Data Systems Corp. and Epson America, Inc. — for a new MSA mainframe/microcomputer software line being introduced throughout 1983. The new product line will combine financial, human resource and manufacturing mainframe software with microcomputer software developed by MSA's subsidiary, Peachtree Software, Inc.

• • •

Corona Data Systems, Inc., manufacturer of IBM Personal Computer-compatible equipment, has signed a software licensing agreement with **Digital Research, Inc.** that will make Digital Research's CP/M-86 operating system and graphics extension available with Corona's 16-bit personal computer at no extra cost.

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InfoWorld

Our newsweekly for microcomputer users provides timely information on the "who, what, where and when" of personal computing in business, home and education, written in easy-to-understand language. *InfoWorld* provides up-to-the-minute editorial coverage of new products, systems, techniques and applications in the fast-breaking, affordable personal computer field.

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Dear David;

Computer
Advice
Columnist:
David Jamison
Carlyle

Dear David,
Talk about a micro explosion! This company reads like a "who's who" of personal computer brands. And now I'm in the midst of everyone's purchase requisitions for printers. How many will I need? Can any printers give me both high speed and high quality? Who will service the mix I'm afraid I'll end up with? Am I going to have to open my own printer shop? I certainly hope not! Some suggestions, David, please.
Signed
Victim of the Micro Explosion

Dear Vic,
Don't despair! The answer to your predicament is as easy as DJC. They carry not only micros, but also the full range of peripherals to take advantage of all those computer adventurers you've got.

Just as DJC is the most trusted name in distribution for the astute corporation, Texas Instruments is known for solid reliability in printing. The TI 810 LQ, in-the-field-proven for many years, is the industry standard for medium speed matrix printing. But even better is its new dual mode option—draft at high speed with regular matrix quality, or slow down for very near letter quality. Two printers in one. Just what your micros need!

By the way, once you get the printer problem solved, I'm betting that you create another problem—even more demand for the micros! And when that happens, call DJC again. They carry a selection of microcomputers wide enough for any business application. But enough for now. Get those TI's and get those micros printing!

David

Dear David,
My company needs to tie thirty terminals to our large IBM system, but the MIS budget just can't afford that many 3278's. David, how do I tell ten division executives that they're the ones who won't be getting the automation they wanted? Some of them outrank me!
Signed
Dollars for Digits

Dear Digits,
You may not have to. But don't expect your traditional computer suppliers to come up with the answer.

DJC has a technical systems department that specializes in solving just your type of dilemma. Experienced hardware, software and communications specialists, together with applications-oriented field marketing experts, determine unique 'mixed vendor' solutions to tele- and data-communications demands on today's corporate computing resources.

Based on my experience, your company would probably do well with a fully IBM 3270-compatible network tying varied types of terminal equipment, suited to the needs of each workstation, to your mainframe. As a matter of fact, DJC has installed many such nationwide communications networks based on Protocol Computers Inc. protocol converters, which even allow dial-up access, graphics and dozens of different printers. In fact, PCI's protocol converters can even plug directly into the existing coaxial cable used by the IBM terminals. But call DJC. They can tell you for sure.

David

PS: They can also train all those executives for you!

Dear David,
What should I do? I am being bombarded by an army of reps, manufacturers and distributors, offering a vast array of computer terminals, microcomputers and communications equipment. The reps and manufacturers always seem to be pushing one particular solution. And the distributors don't seem to offer security, support or enough technical expertise. Please advise!
Signed
Purchasing Phobia

Dear Phobic,
Your points are well taken on both sides of the purchasing dilemma, so don't feel alone. The large manufacturers do have some typical 'big company' benefits, but they are usually slow on delivery and present only one solution. And so many new distributors have sprung up lately that one wonders what they can possibly offer the sophisticated corporation. It's certainly not support.

The company to cure your phobia is DJC. Their years in this industry have earned them a reputation unequalled in commercial distribution. DJC not only can lease or sell you the equipment you've probably been buying, but they also offer you an unbiased opinion on which equipment is really best suited to your application. You won't get that from a manufacturer.

DJC also has the largest selection of inventoried equipment in the industry. By warehousing over 50 brands of computer terminals and data communications equipment, they have virtually eliminated the long lead times of most competitors, or the manufacturers themselves.

Taking care of your data processing and communications needs is DJC's first concern. Which is why they have an in-house staff of technical experts to consult, design and install an entire network configuration—hardware and software.

It is DJC's combination of unbiased opinion and technical expertise that has made companies like American Express, General Electric, Security Pacific National Bank and the J.C. Penney Co. sold on distribution—and DJC.

David

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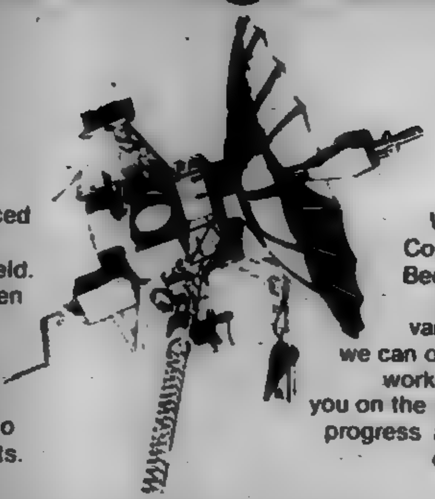

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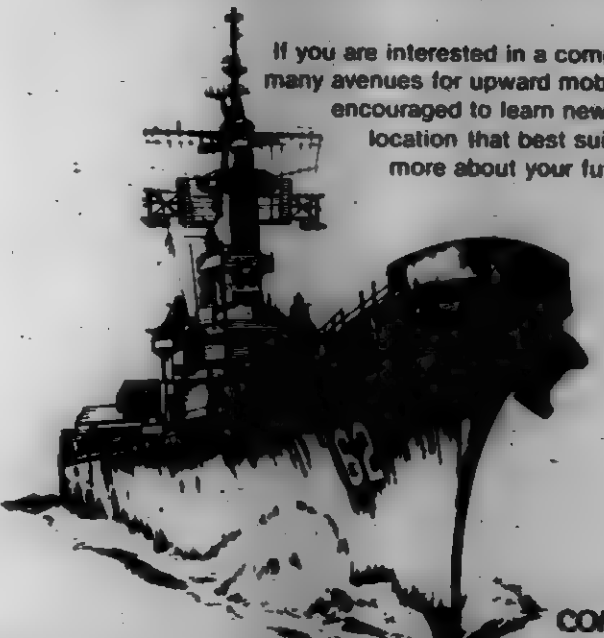

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Software Specialists

General Electric Nuclear Energy Business Operations makes extensive use of advanced operating systems in many aspects of its business. The challenge you'll find here is keeping the Systems operating efficiently, and incorporating modifications and enhancements as required to meet the complex needs of our business.

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Software professionals who can make key contributions to Honeywell and CDC operating systems. Specific background needed:

- 4 years experience maintaining Honeywell GCOS systems and a background which includes proficiency in system dump analysis, assembly language programming and TSS. Technical degree required.
- 4 years experience in NOS operating system internals and data communications to support systems software on a CDC Cyber Series 170. Proficiency in COMPASS and working knowledge of SYMPL or PASCAL-like language required. BSCS (or equivalent) required.

WHERE THE JOBS ARE

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TO EXPLORE

Send detailed resume with salary history to Mr. Solorzano, Ref M/C 324-B, General Electric Nuclear Energy Business Operations, 175 Curtner Avenue, San Jose, California 95125.

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TANO CORPORATION is committed to bringing creativity and ingenuity to its products which include the industry's most sophisticated marine and industrial supervisory control, energy management and data acquisition systems. Our continued expansion offers new opportunities to Software professionals.

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Provide technical and administrative leadership to software projects. Candidates must possess relevant degree and 3-5 years experience in real-time data acquisition and control systems. Applications include liquid or gas pipeline systems, energy management, process control, Motorola 680X, RSX11-M or VAX experience helpful.

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Design software products and custom systems. Candidates must possess relevant degree and minimum of 2 years experience in real-time software development. Data acquisition and control, process control, Motorola 680X, RSX11-M, VAX preferred.

TANO CORPORATION offers an excellent compensation and benefit package, including 100% Company-paid medical insurance, incentive plan and pension trust. Please telephone to present qualifications, or submit confidential resume to:

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DATA PROCESSING
SYSTEMS ANALYST PROGRAMMER V

Central Washington University is currently seeking an experienced professional senior systems analyst or project leader. This person will be responsible for the analysis and programming of administrative information processing systems. This position will assist in the planning, organizing and controlling the work of other systems analysts/programmers.

Minimum Qualifications: One year of experience as a System Analyst/Programmer IV or equivalent; OR two years experience as a Systems Analyst/Programmer III or equivalent. DEC VAX and university administrative computing experience desirable.

Salary range is [illegible] - [illegible] per month.

Applications will be accepted until April [illegible], 1983. Contact Geraldine [illegible], Personnel & Benefits, Central Washington University, Ellensburg, WA 98926. (509) 963-1202.

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SYSTEMS ANALYST

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The future of video games and other electronic home game entertainment looks bright. Parker Brothers has made a major corporate and engineering commitment to that future. We're shooting for a large share of 1983's anticipated market of 80-90 million video game cartridges. And our outstanding success in 1982 — capturing $115 million in sales with only 4 game cartridges — should tell you just how successful we plan to be.

The Future In Video Games.

Game engineering is a significant challenge to your engineering talents. And even though we're not building missiles or mainframes, you'll need every ounce of your ingenuity and creativity to work here. Video game development is characterized by short product development cycles (about 6 months), hot competition, and quick-thinking solutions. There are no cookbooks for video games.

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Who succeeds as an engineer in this unusual new technology? The answer won't surprise you: talented, creative people who are willing to put something extra into their work. A recent article in *IEEE Spectrum*, describing video game designers, applies to every engineer we now seek: "It takes a rare blend of talent: an artistic sense, a feel for popular trends, an ear for sounds, and of course, engineering genius."
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Video game designers and other Parker Brothers game engineers work in the same technological environment as other state-of-the-art engineers. And they work on essentially the same problems. Packing more power into smaller spaces. Increasing resolution. Controlling cost. Maximizing quality. So consider the switch to Game Engineering at Parker Brothers. It may not really be a different kind of engineering.

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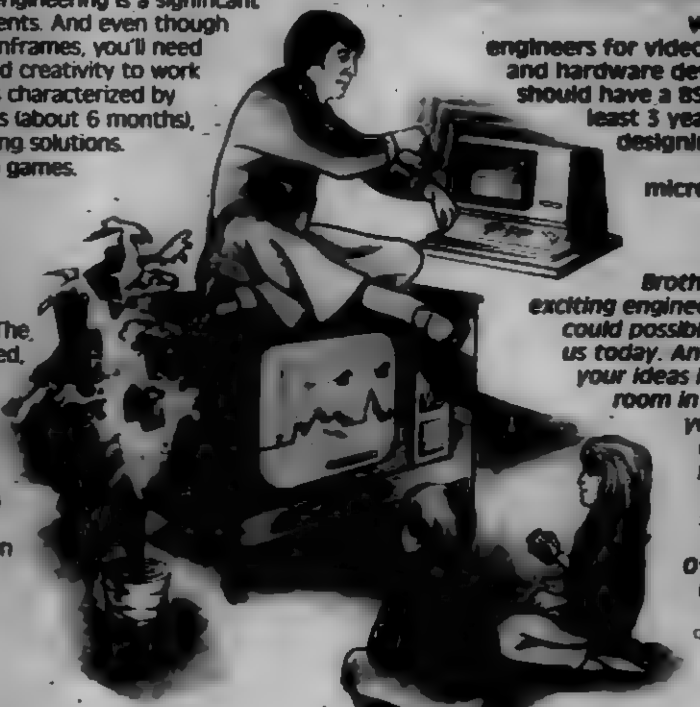

We seek talented engineers for video game software and hardware development. You should have a BSCS or EE with at least 3 years experience in designing fast, playable games or other microprocessor-based new products.

Come to Parker Brothers for the most exciting engineering career you could possibly have. Contact us today. And soon we'll put your ideas into every living room in America. Send your resume in confidence to Nancy Thibedeau, Dept. CW321, 50 Dunham Road, Beverly, MA 01915. Or phone 617-927-7600.

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4331

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Data Communications

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Ask for Bill Dransfield or Jim Gulezian.

Infotron Systems is implementing new long term product strategies. Technically experienced Product Managers can play an important role in our expansion.

Product Management Managers will be responsible for the overall product performance by assuring that all internal departments interact effectively in order that we can continue to deliver our quality products on a timely and cost efficient basis. You must possess both the technical ability as well as the management skills necessary to conduct product status meetings, become a problem solver on both a technical and marketing basis, plan, develop and cordinate new product and new feature releases, analyze design standardization programs, review product brochures and bulletins, and be able to lead, motivate, and direct the entire scope of internal operating departments involved in product manufacturing and marketing. A technical degree, proven marketing experience in a large Fortune 1000 Corporation, and the ability to bring product lines together is necessary for success in these positons.

If you are unable to visit with us during Interface, please send your resume, in complete confidence, to: Mr. William B. Dransfield, Director, Corporate Personnel, Infotron Systems, Cherry Hill Industrial Center, Cherry Hill, New Jersey 08003.

ADDITIONAL OPPORTUNITIES EXIST FOR
experienced Sales Professionals and Software Engineers and Senior Field Service Representatives. Please send your resume to Mr. Dransfield at the address above.

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Infotron Systems

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FOR NEW JERSEY:

You must be a senior DP person with at least 8 years' experience, including a strong operations research background, plus—

- **Broad applications experience.**
- **At least 2 years' in project management.**
- **Familiarity with large-scale projects.**

You will be working with the Branch Manager and Sales Marketing Staff, and could ultimately manage this Professional Services Group effort.

Boeing is currently working with a large communications organization on a national scale. You can expect to spend a good deal of your time in this environment.

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Requires 5 or more years' experience in data processing, with heavy experience in manufacturing and engineering systems, plus—

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- **Understanding of the made-to-order business.**
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FOR BOSTON:

You must be a senior DP professional with at least 8 years' experience, including project management, plus—

- **Background in manufacturing applications and experience in developing large-scale projects.**
- **Understanding of Bill of Materials, Materials Management and Planning.**
- **Financial systems experience is an advantage.**

As with the New Jersey opportunity, success could result in your assuming responsibility for this Professional Services Group effort.

For immediate consideration, please send your resume and salary requirements in confidence to Walter B. Sanderson III.

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SYSTEMS SOFTWARE INC.

DENVER POSITIONS

Data Processing services organization located in the southeast metropolitan Denver area has openings for:

- Systems Programmers - Opportunities for persons with two or more years software internals experience with MVS, CICS, IMS DB/DC or DATACOM DC/DB.
- Information Systems - COBOL or PL/1 technical background with development experience in on-line, highly interactive data base oriented systems. DATACOM or IMS experience desirable. Junior through senior level positions available.
- Applications Specialists - MSA financial systems, including general ledger, payables, receivables. Openings at all levels for persons with experience in fully integrated systems, data entry through data management and reporting.

Persons qualified for any of the above positions are invited to send a resume and salary requirements in complete confidence to:

Employment Manager
P.O. Box 441171
Aurora, CO 80044

EOE M/F/V/H

We regret that we are not able to accept agency referrals.

VICE PRESIDENT - MIS

A large progressive financial institution located in the Midwest is seeking an individual to manage a sophisticated on-line MIS function. The organization's continued growth is closely tied to MIS support, making this a key position - offering a unique career challenge.

The ideal candidate must have a degree and a minimum of 10 - 12 years of data processing experience including 5 - 7 years of MIS management and an emphasis on the design, development and implementation of on-line financial institution applications. Banking experience coupled with IBM operating system environments (COBOL, MVS/DOS, CICS) is strongly preferred.

Responsibilities will include managing and coordinating the activities of 35 MIS support personnel in the development and implementation of state-of-the-art financial institution applications. The candidate will work closely with Senior Management and must have the ability to communicate effectively with Senior Management and major MIS users.

Salary offer will be commensurate with your experience plus a competitive benefits package.

Qualified candidates are encouraged to send a confidential resume, including references, salary history and requirements to:

CW-B4113
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Highly motivated, career oriented, data processing professionals are needed to work in a creative, challenging environment. Bachelors degree in computer science, math, business, or a related field preferred. 2 to 3 years experience in programming and systems analysis with emphasis on analysis. 1 year of programming mandatory. Starting salaries range from $22,356 to $25,296. If hired, applicant must reside in Weld County.

Technical environment: IBM 4341-2 using DOS/VSE with a large teleprocessing network using CICS/VS and DMS. COBOL knowledge preferred. System supports many different users.

OR ANY EQUIVALENT COMBINATION OF EDUCATION AND EXPERIENCE

Apply at Weld County Personnel Department, 915 10th Street, Greeley, CO 80631.

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SOFTWARE SUPERVISOR

Join the management team of professionals directing the city/county joint computer facilities. Current environment: 4341-2, DOS/VSE, POWER/VS, CICS/VS, and VM. This is the lead position for the technical support group reporting to the director.

Responsibilities: Evaluation and selection of new software, assist management in selection of future hardware upgrades and resource management planning. Generation and maintenance of current software, technical support for applications and operations areas, and managing software staff of 3. Must have ability to communicate clearly with user groups and staffs in non-technical terms.

This challenging position requires a background in DOS/VSE operating systems and CICS communication networks, a degree or equivalent work experience, current working knowledge of ASSEMBLER, ANS COBOL, and experience with VSAM, VM, and CICS. At least 5 years current work experience in software. Supervisory experience is helpful.

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Pieces of our mind. Part three.

There is only one way to explore the multi-dimensional array of opportunities being generated continuously at Ford Aerospace in the BWI area of Maryland— by direct interaction with our leaders who are contributing to the implementation of our high technology capabilities.

The inputs from three department managers are briefly summarized below. If you sense the more profound opportunities implied by their remarks, call or write so that we can arrange open, face-to-face discussions at your earliest convenience.

We are in a vigorous growth mode. Our newly constructed, second building at BWI is 80,000 square feet of the latest, tangible evidence. Yet this was an 18-person start-up operation of WDL as recently as 1980. By 1982 our numbers surpassed 200, and we are now where we expected to be by 1985. Our technology and systems development orientation has brought us world-wide responsibilities. And the pace is quickening.

U.S. citizenship is required for all positions.

Very few Systems Engineers have enough interdisciplinary command to handle systems this large, often on a "bottoms up" basis!

You're not likely to find yourself doing two-of-a-kind systems here. You'll be starting with relatively large systems in themselves, yet they will become only portions of a much larger system.
The programs call for high level systems engineers with experience in local area networks, packet switching networks, familiarity with the X.25, the new X.75, or even the older RS232 protocols, and knowledge of the DEC or SEL computer families.

The size and complexity of the programs demand the very highest systems integration skills— individuals with the ability to cut through what may appear to be conflicting approaches and home in on the commonalities that lead to successful interoperability... all this in a real-world that sometimes demands bottoms-up creation of specifications "by inference" as you evaluate and bring together a vast number of independently developed system elements.

Our "Chief Programmer Teams" make huge software systems solvable. They also boost people to leadership "before their time."

Some very challenging work involving SEL computers calls for individuals with a depth of experience with the hardware, with the MPX operating system, with the IOP, and knowledge of the X.25 protocol. Related activities (and opportunities) encompass PDP-11's under RSX 11M, and VAX 11/780's. Advanced degrees and up to 10 years of dynamic experience in software systems engineering are appropriate qualifications. FORTRAN programmers with structured programming experience on any of the three machines are also in great demand here.

What's perhaps most exciting about the challenges in this group is that your leading associates are acknowledged heavyweights who have been closely involved with the architecture and development of advanced hardware and software. They are looking forward to sharing their experience in meeting leading edge challenges of the defense community with like-minded individuals.

Integration and testing of large electronic systems

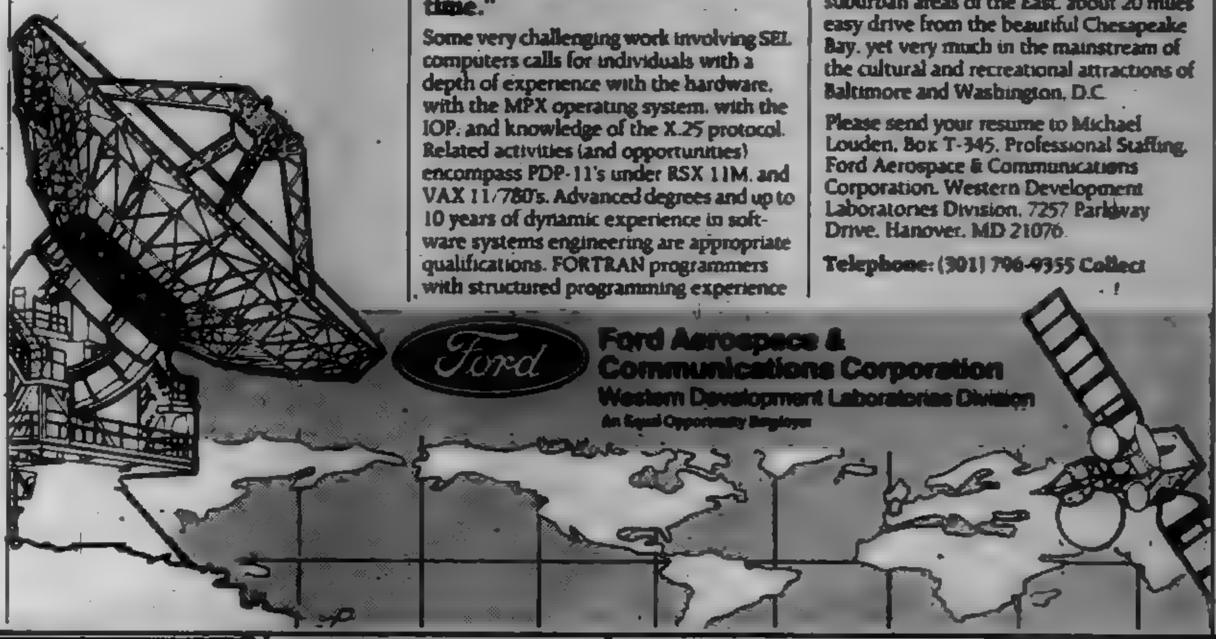
Openings are plentiful for hard-driving, dynamic engineers who enjoy being placed in a challenging and often frustrating position. You will be responsible for physical integration and functional performance validation. Integration plans, test plans, test procedures, test conduct, and test reports are part of the challenge.

A word about the Ford Aerospace operation in the Baltimore/Washington Corridor.

If joining us means relocating, company assistance will be available: and you will find yourself in one of the most desirable suburban areas of the East, about 20 miles easy drive from the beautiful Chesapeake Bay, yet very much in the mainstream of the cultural and recreational attractions of Baltimore and Washington, D.C.

Please send your resume to Michael Louden, Box T-345, Professional Staffing, Ford Aerospace & Communications Corporation, Western Development Laboratories Division, 7257 Parkway Drive, Hanover, MD 21076.

Telephone: (301) 796-9355 Collect



Ford

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Western Development Laboratories Division
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SOFTWARE ENGINEERS

Development Opportunities For

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Our current need is for software engineers in a new product development. Your primary responsibilities will include the design and implementation of data management services and user access methods for optical storage system.

The ideal candidates will be knowledgeable in MVS architecture, proficient in 370 assembler language, and have direct experience with MVS internals. Openings exist in all levels.

UNIX PROGRAMMERS

You will be a member of a design team writing software testing, create test automation facilities, and data base software. You must have a solid working knowledge of UNIX, C and shell programming. Knowledge of internals and TP desirable. BS in Computer Science or equivalent and a minimum of two years engineering experience is preferred.

For immediate consideration, please send your resume to CW-B4111, Computerworld, Box 880, Framingham MA 01701.

SOFTWARE PROFESSIONALS

Program Resources, Incorporated, Annapolis, Maryland life science consulting firm, is looking for qualified individuals to be part of the toxicology system development effort at the National Center for Toxicological Research (NCTR) in Jefferson, Arkansas. System environment includes: IBM 4341 OS/VS1, VM, CMS, ADABAS, Complete, and Natural. Modcomp mini computers running on-line data collection systems to be replaced by VAX. Z80 BASED standalone data collection terminals.

Application Software Manager - Real time mini applications and mainframe DBMS experience a plus. High 30K range DOE.

DBA Staff Members - DBMS on IBM with OS experience required. ADABAS experience a plus. 30K range DOE.

Programmer/Analyst - 3 plus years in OS environment desired. ADABAS experience a plus. 30K range DOE.

DEC On-Line Data Collection System Designer - Scientific applications and VAX experience preferred. 30K range DOE.

To apply, send resume to Program Resources, Inc., P.O. Box 153, Jefferson, AR 72079. Principals Only.

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[illegible]

Whittaker, a leading international health care contractor, has immediate openings for qualified computer professionals. These positions offer excellent salaries, tax advantages for eligible U.S. citizens, and an extensive benefit package.

Manager-Data Processing: Responsibilities include managing data processing activities; setting overall department objectives, developing and implementing data processing requirements for administrative divisions; planning hardware development for future needs; supervising all training within the department and setting and maintaining professional standards of work and documentation.

You must have a Bachelor's degree in Computer Science or similar field; 8-10 years data processing experience (2 as data processing manager or project leader, plus 3 in programming/systems analysis); familiarity with major commercial applications including general ledger, payroll, personnel and materials systems; experience with IBM 370 or 4300 hardware (DOS). (COBOL required, RPGII preferred).

Realtime Systems Engineers: Responsibilities include participation in developing, enhancing and maintaining software, and training programs for Saudi Arabian trainees.

You must have 3 years experience in software development; proficiency in assembly language programming, and be able to communicate in writing and verbally to all levels of personnel.

NOTE: Other fine openings at this time include Programmer Analysts and Systems Analysts.

Respond, outlining your experience, education and salary history to:
John Phillips, Box 12028, Whittaker International Services Co.,
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FACULTY POSITION IN DATA PROCESSING
Allegany Community College

Allegany Community College, a comprehensive public community college located in beautiful Western Maryland, invites applications for a tenure-track faculty position in data processing. The position is effective for the Fall Semester, 1983 (starting date: August 15, 1983).

Bachelor's degree in Computer Science or related field required. Master's degree and above preferred. Work experience in data processing/computer science area and/or teaching experience desirable. Experience in COBOL language preferred.

Rank is dependent upon education and experience. Salary ranges for a 9-month contract are: Associate Professor $17,870 - 21,970; Assistant Professor $15,260 - 20,790; Instructor $11,520 - 17,450. Summer and overload teaching available. An attractive fringe benefit program is provided.

Applicants should submit a letter of interest, a current resume with the names, addresses, and telephone numbers of three employment references to Mrs. Rhonda K. Layman, Personnel Officer, Allegany Community College, Willow Brook Rd., Cumberland, Maryland 21502. Deadline for receipt of all applications for the position is March 30, 1983.

Allegany Community College is an equal opportunity/affirmative action employer.

IBM SOFTWARE SUPPORT SPECIALIST FOR ASSIGNMENT IN GERMANY

Our client located in the Southern West Germany area is looking for a high caliber individual to lead technical support functions for IBM's MVS and VM system software.

You should have:

- Experience in MVS system programming and generation
- Practical experience in installation and maintenance of software
- At least 5 years experience as a team leader
- Co-operativeness and a sense for communication

The right candidate will not only have the professional experience, but also be willing to undergo further training, and as well have the ability to work as a leader of a team of highly experienced MVS and VM specialists.

Salary offerings are competitive and relocation assistance is provided. If you are ready to make a three years commitment, send resume in confidence to our Steinbach Vollmer-Agency (code CS10) or Phone Mrs. Steidl who will be pleased to give you any information you may desire.

Steinbach & Vollmer GmbH
Personalberatung

D-8000 Muenchen 80, Neherstr. 1 Germany
Phone: 0114989-4705087, Telex: (Germany) 5216445
PP430.3

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Plans, coordinates, supervises and manages the operations of a data processing technical support division including systems programming, computer operations, micrographic services and records management. Position requires a Bachelor's degree in data processing, computer science or other field directly related to data processing, plus 5 years of professional level data processing experience including at least 3 years of systems programming experience and 2 years of supervisory experience. County application must be in personnel by 5 pm on 3/31/83. Personnel Department, Room 118, Snohomish County Courthouse, Everett, WA 98201 (206) 259-0842. EOE

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Programs the solutions of data systems under development, documents programs and test systems. Position is located in Casper, WY. Previous programmer/analyst experience with Employment Security Commission would be helpful. Salary Range per month $1801 to $2229. Minimum 4 or more years experience. State of Wyoming is an Equal Opportunity Employer. Send resume to: State of Wyoming, Data Services Division, 346 South Center, Casper, WY 82601, Attn: [illegible], closes 3/31/83

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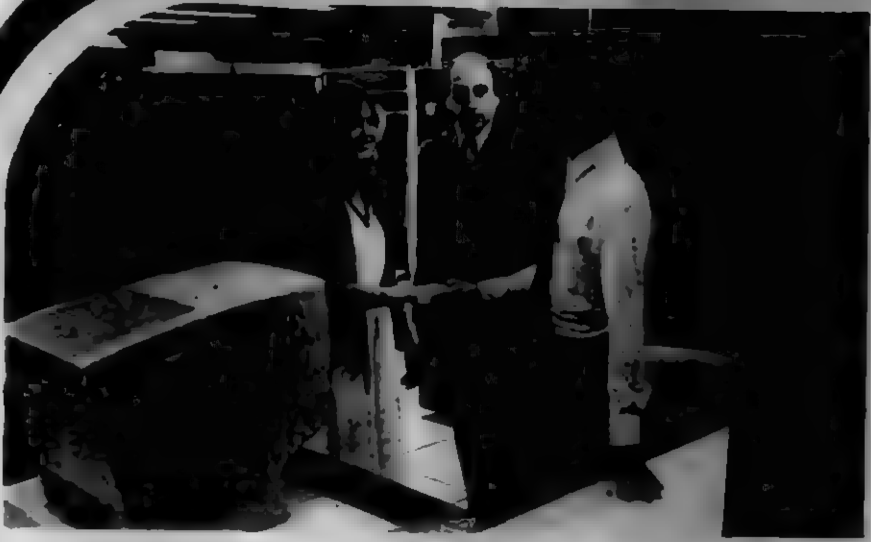

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DALLAS: DataPro Personnel Consultants
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DETROIT: Electronic Systems Personnel, Inc
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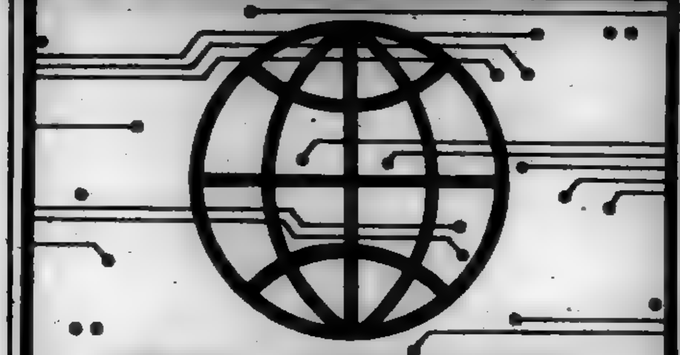

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Data Processing

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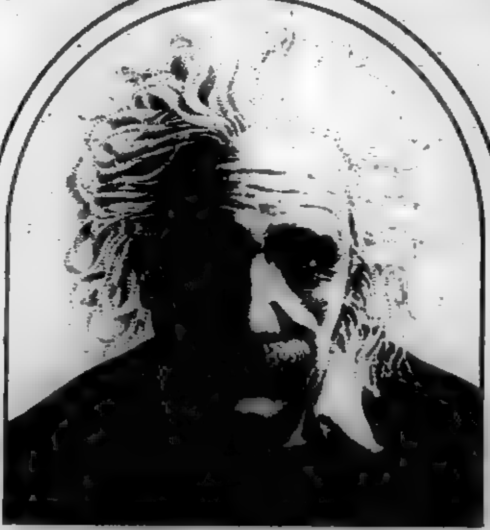

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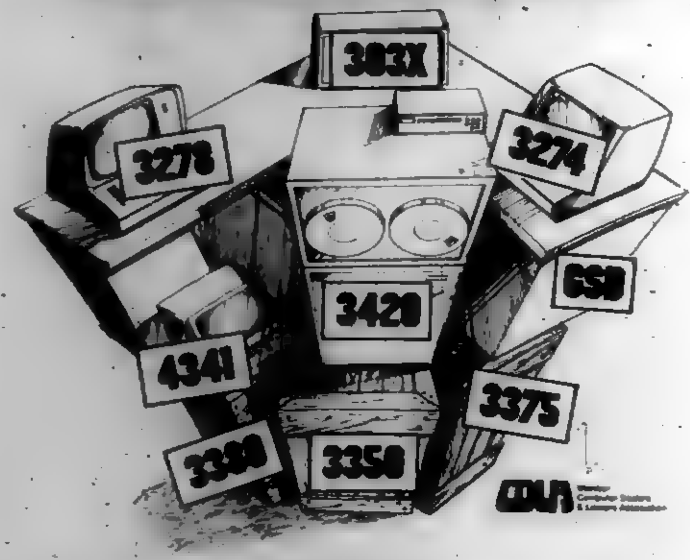

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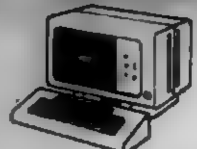

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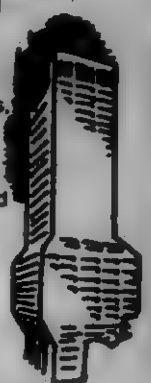

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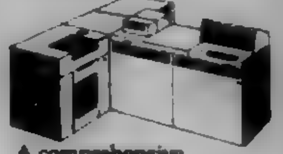

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Amer-Cal 24
American Key Data 86
Apollo 76-77

The Back Store 94
BDS Computer Corporation 9
John Beall Company 87
Beehive International 93

CADO 60-61
CIE Systems 14
Cincom Systems 17
CMI Corporation 78
Codex Corporation 18-19
ComDesign 25
Computer Corp. of America 69
Computeristics ID/21
Computer Management Research 33
Computer Publications Inc. 61
Computerwoche 79
Computerworld International Marketing 40
Computerworld Office Automation 106
Computerworld On Communications 63
Computerworld Supplement 54
Conference Management ID/23
Conference Management/DMW Group 96
Cord Cable Co. 98
Corodale 49
CRWTH Computer Coursewares ID/18
Cullinet ID/5
CW Buyers Guide 85
CW Corporate 105
Cytrol 31

Dallas Market Center 12
Data Base Technology 30
Data General 80-81
Datapoint Corp. 52
Datapro Research Corp. 47
Data Rentals-Sales 65
Datastream Communications 67
Digital Associates 46
Digital Equipment Corp.
—Large Computer 90-91
Digital Equipment Corp.
—Professional PC 34-35
Digital Equipment Corp.
—TPG 73
Digital Pathways ID/20
Digitec Software Designs, Inc. 23
D.J.C. Corporation 29,105

EMC Corporation 102
Emulex Corporation ID/22
Espirit 39

First Boston ID/4
Focus Research 86

G.E. Intersil Systems 44
General Research Corp. 52
General Systems 68
Group Operations 72

Halcyon 84
Hambrecht & Quist 27
Henco Inc. 37
Hewlett-Packard 57
H&W Computer Systems 38

IBM 50-51,97
IDA Ireland 86
Information Science 32
Innovation Data Processing 7

Johnson Systems 92

J.W. Lampi, Inc. 68
Lear Siegler 23,25,27,29
Lee Data Corp. ID/13
List Processing 108
Litton Data Systems 20
Local Data 23

Management Science America 132
Martin Marietta 95
Merlyn Corp. 56
Micom Systems 98
Microterm 98
Mitron Systems Corp. 16
Mohawk Data Science 99,101,103
Moore Business Forms 48
MPC ID/10
MSP, Inc. 74-75
MTI Systems Corp. 94

National Advanced Systems 42-43
Newman Computer 92

Okidata 82
Omni Offices 74
Oxford Software Corp. 55

Protocol Computers 30,31,32,33,ID/10

Questronics ID/16

Responsive Computer 62
Robert Routman Associates 13
Rogue River Software 22

SAS Institute ID/8-ID/9,59
SDI 101
Signal Technology 94
Silver Cave Properties 36
Software International 89
Spectrum International 45
Storage Technology ID/24
Stratus Computer ID/7
Syncsort 3
Sysed 29
Systar 36
Sytek Corporation 68

Tab Products ID/14
T-Bar 22
Technology Transfer Institute 26,64
Techtran 96
Televideo Systems 20-21
Texprint Inc. 84
Tone Software 29
Tower Systems 35
Tri-Data ID/6
Tymnet 66
Tymshare 82

United Airlines ID/12
Universal Data Systems ID/2

Wall Data 70
Wang Laboratories 15,ID/17
Wild Hare Computer Systems 103
Wolfe Computer Testing 38

Xerox Corporation 26,ID/3

Yourdon 5,ID/15

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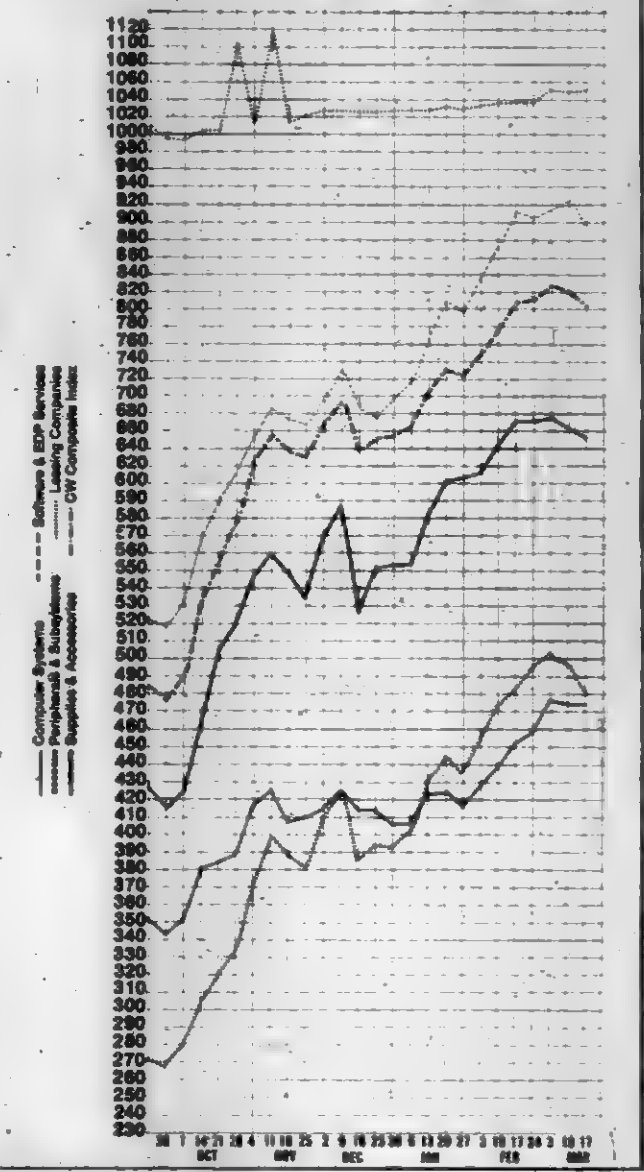
Computerworld Stock Trading Index



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Computerworld Stock Trading Summary

All statistics compiled computed and formatted by TRADE QUOTES INC Cambridge, Mass. 02139

CLOSING PRICES WEDNESDAY, MARCH 16, 1983

COMPUTER SYSTEMS

EXCH		PRICE 1982-83 RANGE (1)	CLOSE MAR 16 1983	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP	17- 44	38 1/8	+ 1/4	+0.6
N	BURROUGHS CORP	28- 48	48 1/2	- 1/2	-1.0
O	COMPUTER AUTOMATION	7- 17	14 3/4	- 1/2	-3.2
N	CONTROL DATA CORP	21- 51	47 1/8	-1 7/8	-3.8
O	CRAY RESEARCH INC	20- 48	41 1/4	- 7/8	-2.0
N	DATA GENERAL CORP	20- 61	53 7/8	-4 3/8	-7.5
N	DATAPOINT CORP	11- 38	22 5/8	- 1/8	-0.5
N	DIGITAL EQUIPMENT	62-132	125 1/2	-4 5/8	-3.5
A	EECO INC	8- 12	11 1/8	- 5/8	-5.3
N	ELECTRONIC ASSOC.	5- 12	8 3/8	- 5/8	-6.2
N	FLOATING POINT SYST	18- 37	33 1/2	-1 5/8	-4.6
N	FOXBORO	22- 43	36 1/2	- 5/8	-1.6
O	FULCRUM CORP GRP	1- 3	1/4	0	0.0
O	GENERAL AUTOMATION	3- 8	6 3/8	- 3/8	-5.5
N	HARRIS CORP	20- 51	44 1/4	-1 5/8	-3.5
N	HEWLETT-PACKARD CO	38- 87	80 5/8	- 3/8	-0.4
N	HONEYWELL INC	60-104	94 1/2	+ 1/8	+0.1
N	IBM	57-103	98 7/8	-3 3/8	-3.3
O	IPL SYSTEMS INC	3- 11	8	- 3/4	-8.5
O	MAGNUSON COMP SYSTS	2- 5	3	0	0.0
N	MANAGEMENT ASSIST	7- 18	15 5/8	+1	+6.8
O	MINI-COMPUTER SYST	1- 2	1	+ 3/8	+60.0
N	MODULAR COMPUTER SYS	6- 15	11 5/8	- 3/8	-3.1
N	MOHAWK DATA SCI	10- 18	15 1/2	- 1/2	-3.1
N	NCR	38-108	105 1/2	+1 3/4	+1.6
N	PERKIN-ELMER	17- 33	28 1/4	-2 1/4	-7.3
N	PRIME COMPUTER INC	16- 45	38 3/4	-2 1/8	-5.0
N	SPERRY CORP	21- 38	34 1/8	-1 1/2	-4.2
O	TANDEM COMPUTERS INC	14- 34	25 3/4	-1 5/8	-5.9
N	TEXAS INSTRUMENTS	71-176	161	+1 7/8	+1.1
A	WANG LABS "B"	13- 37	31	-2 1/4	-6.7
A	WANG LABS "C"	11- 37	31	-2 1/2	-7.4

LEASING COMPANIES

EXCH		PRICE 1982-83 RANGE (1)	CLOSE MAR 16 1983	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE FINANCIAL CP	22- 35	32 1/4	0	0.0
N	COMDISCO INC	7- 25	22 7/8	-3 3/8	-12.8
B	COMMERCE GROUP CORP	1- 1	1/4	0	0.0
O	COMPUTER INVSTRS GRP	1- 2	1/2	0	0.0
O	CONTINENTAL INFO SYS	5- 21	20	+ 1/2	+2.5
N	DPF INC	5- 14	12	- 3/8	-3.0
O	ITEL	1- 3	1	+ 1/4	+33.3
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	18- 41	40	- 1/8	-0.3

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON;
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
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SOFTWARE & EDP SERVICES

EXCH		PRICE 1982-83 RANGE (1)	CLOSE MAR 16 1983	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 4	4	+ 1/4	+6.6
O	ADVANCED SYSTEMS INC	8- 24	21	-1 1/2	-6.6
O	AGS COMPUTERS INC	7- 22	18 1/4	- 3/4	-3.9
N	ANACOMP INC	8- 22	18 1/2	-1 1/4	-6.0
O	ANALYSTS INTL CORP	5- 9	9	+ 1/4	+2.8
A	APPLIED DATA RES.	18- 48	48 1/8	+ 1/2	+1.0
O	ASK COMPUTER SYSTEMS	18- 38	28 1/2	0	0.0
B	ASTRADYNE COMP IND	1- 5	3 3/4	- 3/4	-16.6
N	AUTOMATIC DATA PROC	21- 40	36 1/2	-2 1/2	-6.4
O	CGA COMPUTER ASSOC	5- 14	14 1/4	+1	+7.5
O	COMPUTER ASSOC INT'L	12- 47	40 1/4	-2 3/4	-6.3
O	COMPUTER HORIZONS	2- 12	14 1/2	+ 1/2	+3.5
O	COMPUTER NETWORK	4- 10	7 7/8	- 5/8	-7.3
N	COMPUTER SCIENCES	11- 23	18 7/8	-1 1/2	-7.6
O	COMPUTER TASK GROUP	8- 18	18 1/2	+ 3/4	+4.2
O	COMPUTER USAGE	2- 22	18 1/2	-1 1/4	-6.0
B	COMPUTONE SYSTEMS	19- 38	31	+ 1/4	+0.8
O	COMSERV CORP	11- 20	18 1/4	-1	-5.7
O	COMSHARE	6- 13	11 1/2	-1 3/8	-10.6
N	CULLINET SOFTWARE	12- 35	30 3/4	-2 1/4	-6.8
O	CYCARE SYSTEMS INC	8- 18	16 3/8	- 1/8	-0.7
O	DATA DIMENSIONS INC	1- 2	1/4	0	0.0
O	DATATAB	0- 2	3/4	0	0.0
O	DYATRON CORP	2- 4	3 1/2	0	0.0
N	ELECTRONIC DATA SYST	18- 38	38	+2	+3.5
N	INFORMATICS INC	10- 28	27 1/2	+ 1/4	+0.9
O	INSYTE CORP	1- 3	1 7/8	0	0.0
O	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	4- 9	7 1/2	0	0.0
A	LOGICON	12- 38	38 1/4	+1	+2.8
O	MGMT SCI AMER INC	8- 28	23	0	0.0
O	MATHEMATICA INC	12- 22	18 1/4	- 3/4	-3.8
O	MATHEMATICAL APP GRP	12- 22	18 1/2	-2	-9.3
O	NATIONAL DATA CORP	5- 24	21	- 1/4	-1.1
O	PANSOPHIC SYSTEMS	8- 25	23 1/2	- 1/8	-0.5
N	PLANNING RESEARCH	6- 16	13 7/8	-1 1/8	-7.5
O	PROGRAMMING & SYS	1- 4	3 1/2	+ 1/8	+3.7
O	REYNOLDS & REYNOLD	17- 38	38 1/4	-1 1/4	-2.3
O	SEI CORP	11- 25	21 1/2	-2	-8.5
O	SHARED MEDICAL SYST	13- 35	31	-1 1/2	-4.6
O	SCIENTIFIC COMPUTERS	6- 13	12 1/2	0	0.0
O	SOFTWARE AG	5- 17	9 1/4	-1	-9.7
N	TYMSHARE INC	12- 30	22 5/8	-1 1/8	-4.7
A	UPS CORP	9- 14	12 3/4	-1 1/2	-10.5
N	WYLY CORP	7- 13	11 3/4	- 5/8	-5.0

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1982-83 RANGE (1)	CLOSE MAR 16 1983	WEEK NET CHNGE	WEEK PCT CHNGE
P	AM INTERNATIONAL	2- 6	3 3/8	- 1/4	-6.9
A	ANDERSON JACOBSON	9- 25	18	-1	-5.2
O	AUTO-TROL TECHNOLOGY	8- 21	15	-2	-11.7
O	BANCTEC INC	7- 39	18 3/4	+ 3/4	+4.2
A	BEEHIVE INT'L	4- 11	10 1/4	-1	-8.9
A	BOLT.BERANEK & NEW	12- 40	38	-1 3/4	-4.7
B	CANBEX CORP	2- 4	2	- 1/8	-5.9
N	CENTRONICS DATA CORP	6- 20	17 5/8	-1 7/8	-9.6
A	CETEC CORP	4- 9	7 7/8	- 1/8	-1.5
B	COGNITRONICS	2- 14	11 3/8	-1 1/2	-11.6
B	COMPUTER COMMUN.	1- 2	1 3/8	0	0.0
A	COMPUTER CONSOLES	13- 44	38 3/8	- 3/4	-1.9
B	COMPUTER DEVICES INC	4- 21	13 5/8	-1 3/8	-9.1
O	COMPUTER TRANSCEIVER	4- 8	8 3/8	+1	+13.5
N	COMPUTERVISION CORP	26- 43	38 3/4	-1 3/8	-3.3
N	CONRAC CORP	21- 36	31	-1 7/8	-5.7
A	DATA ACCESS SYSTEMS	1- 4	1 1/2	0	0.0
A	DATAPRODUCTS CORP	8- 21	20	-1 1/4	-5.7
A	DATARAM CORP	5- 12	10 1/4	- 1/8	-1.2
O	DATUM INC	2- 11	9 3/4	- 3/4	-7.1
O	DAVID JAMISON CARLYL	2- 7	4 1/8	+ 3/8	+9.0
B	DECISION DATA COMPUT	3- 16	10 3/8	-1 1/4	-10.4
O	DELTA DATA SYSTEMS	1- 4	3 1/8	- 1/8	-3.8
N	ELECTRONIC M & R	5- 9	9	+ 1/2	+5.8
O	EVANS & SUTHERLAND	18- 50	41 3/4	+ 1/4	+0.6
O	GANDALF TECHNOLOGIES	10- 22	16 3/8	+ 1/8	+0.7
N	GEN'L DATA COMM IND	6- 18	16 5/8	-1	-5.6
O	GENERAL TERMINAL CP	0- 2	3/4	- 1/8	-20.0
O	GREAT SOUTHWEST IND	2- 8	3	+ 1/2	+20.0
N	HAZELTINE CORP	22- 58	57 7/8	+1 1/4	+2.2
O	ICOT CORP	3- 10	7 5/8	- 1/4	-3.1
O	INFORMATION INTL INC	10- 22	19 3/4	- 1/2	-2.4
O	INTEL CORP	21- 47	47 1/4	+4	+9.2
O	IPL SYSTEMS INC	3- 11	8	- 3/4	-8.5
A	LUNDY ELECTRONICS	7- 15	13	-1 1/2	-10.3
A	MSI DATA CORP	14- 36	18 7/8	+ 1/4	+1.3
O	NETWORK SYSTEMS CORP	15- 43	38 1/4	+ 1/8	+0.3
O	OMEX	3- 5	3 1/2	0	0.0
N	PARADYNE CORP	24- 51	46 1/2	+ 1/4	+0.5
A	PENRIL CORP	7- 13	12 1/2	- 1/8	-0.9
O	QANTEX CORP	12- 28	21 3/4	-1 3/4	-7.4
N	RECOGNITION EQUIP	4- 13	10 1/4	- 1/2	-4.6
O	SCAN DATA	1- 3	1 3/8	0	0.0
N	STORAGE TECHNOLOGY	18- 33	21 3/8	-2	-8.4
O	SYKES DATATRONICS	6- 27	8 3/8	- 1/2	-5.6
A	T BAR INC	7- 14	12	- 1/4	-2.0
A	TEC INC	6- 12	9 1/8	- 3/8	-4.4
N	TEKTRONIX INC	34- 73	68 1/4	-1 3/8	-1.9
N	TELEX	5- 27	23	-2	-8.0
O	TERADATA SYSTEMS CP	3- 10	8 1/8	- 1/4	-3.0
N	TIMEPLEX INC	7- 24	20 1/8	+2	+11.0
O	VISUAL TECHNOLOGY	8- 30	18 1/2	- 1/4	-1.2
O	WILTEK INC	1- 3	2 7/8	0	0.0

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EXCH		PRICE 1982-83 RANGE (1)	CLOSE MAR 16 1983	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN BUS PRODS	11- 22	20 5/8	-1	-4.6
O	BALTIMORE BUS FORMS	1- 2	1	0	0.0
N	BARRY WRIGHT	13- 25	25	+ 3/4	+3.0
O	CYBERMATICS INC	1- 1	1 1/4	- 1/8	-9.0
A	DUPLEX PRODUCTS INC	12- 21	20 1/2	+ 1/2	+2.5
N	ENNIS BUS. FORMS	15- 32	31 1/2	+2	+6.7
N	3M COMPANY	48- 82	78	-2	-2.5
N	MOORE CORP LTD	35- 47	46 3/4	+1 1/2	+3.3
N	NASHUA CORP	8- 19	13 7/8	- 1/8	-1.7
O	STANDARD REGISTER	32- 53	53	0	0.0
A	TAB PRODUCTS CO	8- 23	22 3/4	+1 1/4	+5.8
N	WALLACE BUS FORMS	22- 36	32 1/2	-2 1/8	-6.0

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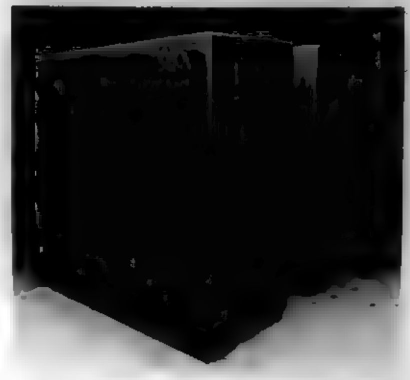

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NEWSPAPER

AT&T: Monster Or Martyr?

By Bruce Hoard
CW Staff

MIAMI BEACH, Fla. — Depending on whom you believed, AT&T is either an avaricious monster bent on exploiting ratepayers or just an emergent communications competitor fighting off the shackles of overzealous regulators.

Interface '83 coverage continues on Pages 10-13.

Those two opinions bracketed a wide range of comments delivered by a panel of six experts during a session on communications deregulation at the Interface '83 conference and exposition here last week.

Albert H. Kramer, an attorney with the law firm of Cohn and Marks in Washington, D.C., hammered away at AT&T, accusing the world's largest corporation of multiple and heinous offenses.

For instance, Kramer claimed

(Continued on Page 8)

Standards Program Jeopardized

Reagan Reconsidering NBS Cuts

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The Reagan administration said last week it is reconsidering its plan to eliminate most of the National Bureau of Standards' DP standards program.

Under the budget submitted to Congress by the Reagan administration, funds for the NBS Institute for Computer Sciences and Technology would be cut by 70%, leaving it only $3 million in fiscal 1984. The institute would stop its standards development activities and concentrate on adopting appropriate standards for federal use from national and international standards-setting organizations [CW, Feb. 28].

The budget cuts have been strongly criticized by members of Congress, the scientific community and some representatives of the DP industry. At a hearing last week on the proposed ICST budget, NBS director Dr. Ernest Ambler told a House of Representatives science and technology subcommittee that the Commerce Department, the NBS' parent agency, is reviewing "all [Commerce] programs relevant to telecommunications and information systems with the intention of improving cooperative efforts and information exchange and policy planning."

As part of this review, he said, "additional resources for ICST are being discussed within the administration."

At a second hearing on the ICST budget last week, Douglas T. Ross, chairman of the National Academy of Sciences' ICST Evaluation Panel, said that rather than reduce the institute's funds, the government should appropriate at least $15 million for its 1984 activities.

Ross, founder and chairman of Softech, Inc. in Waltham, Mass., said of the White House belief that the

(Continued on Page 5)

AT&T Agrees to License Videotex Technology Free

By Phil Hirsch
CW Washington Bureau

MIAMI — AT&T will license its videotex display technology on a royalty-free basis, it was learned here last week.

The news that the company would license its videotex technology at all — permitting work on a proposed North American videotex standard to go forward — came earlier this month from the American National Standards Institute's legal counsel [CW, March 21].

The future of the proposed standard, known officially as the North American Presentation Level Protocol Syntax, had been in doubt because its underlying technology is the subject of pending AT&T patent applications. Ansi rules allow patented technology to be standardized, but only if the patent owner agrees to license the patent on reasonable terms.

Word that AT&T would not charge for licensing its videotex technology was received at a meeting here last week of X3L2, the Ansi

(Continued on Page 5)

DP Managers Encouraging Personal Computing . . .

By Marguerite Zientara
CW Staff

"Personal computers networked to a common data base are the future of DP," Tim Sagstetter, DP coordinator for Wausau Metals Corp. in Wausau, Wis., believes. "As soon as full-functioned communications become available . . . we will jump in with both feet.

"The [personal computer] is the key to decentralizing the DP work load," Sagstetter said. "All that is needed for successful implementation is a well-coordinated plan of purchase and support."

That about sums up the prevailing attitude toward personal computers in the work place, judging from a recent mail survey of 500 *Computerworld* subscribers who are DP managers in U.S. firms of all sizes. Two hundred twenty subscribers responded, for a 44% response rate.

To be sure, many DP managers are not as forward-looking as Tim Sagstetter, but a majority of respondents (137, or 62.2%) said they encourage the use of personal computers by end users, whether they are currently using them and whether they are having problems. Only 26 managers said they discourage the use of personal computers, and 30 were indifferent.

Almost twice as many of the firms surveyed have personal computers being used (145) as do not (75) — either stand-alone, remotely linked to a mainframe or a combination of the two.

Respondents usually indicated there are only a handful of personal computers in each company, but 11 firms have over 100 personal computers and three very large companies (24,000 to 90,000 employees) are using several thousand personal computers.

The majority (95, or 65.5% of the 145 personal computer users) have stand-alone personal computers only, and 43

(Continued on Page 14)

SPECIAL**REPORT**

Inside — Micros in Big Business: Opening the DP Window

. . . But E.F. Hutton Rejects Micros for Terminal Net

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — One of the leading brokerage houses in the U.S. has rejected conventional microcomputers as the chief vehicle for delivering personal computing power to its users.

Although personal computing figures prominently in E.F. Hutton, Inc.'s long-range systems strategy, the company opposes the large-scale installation of personal computers themselves, Hutton's executive vice-president of operations, Norman Epstein, said here last week. Instead, the firm plans to use a network of dumb terminals and time-shared superminis as the cornerstone of its future personal computing environment, Epstein told an estimated 150 attendees at a Fortune 1,000 Personal Computer Market Forum sponsored by Richardson, Texas-based Future Computing, Inc.

Rather than replacing its existing network of 5,000 dumb terminals with large numbers of personal computers, Hutton plans soon to conduct a technological "brain transplant" operation aimed at boosting the termi-

(Continued on Page 7)

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Please address all correspondence to the appropriate department at Box 880, 375 Cochituate Road, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153.

OTHER EDITORIAL OFFICES & SALES OFFICES:

New York: Suite 7G, 401 East 80th St., New York, N.Y. 10021. Phone: (212) 570-2135.

West Coast: 257 Lytton Ave., Palo Alto, Calif. 94301. Phone: (415) 328-8064.

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England: Bill Dunlop, Stephen Thomas, [illegible] Associates, 305 Goswell Rd., Islington, London EC1V 7HN. Phone 01-278 3413/4.

W. Germany: Eckhard Utpadel, CW Publikationen, Friedrichstrasse 31, 8000 Munich 40. Phone: (089) 36-40-61. Telex 5215350.

France: Pierre [illegible], Le Monde Informatique, 42, Avenue Montaigne, 75008 Paris. Phone 720 85 66.

Japan: Mr. [illegible], Computerworld Japan, 7-4 [illegible] 3-Chome, Chuo-ku, Tokyo 104. Phone: (03) 581-3082. Telex 252-4217. [illegible] H. Yamada, Tokyo Representative Corp., Yamaguchi Bldg., 2-12 Kanda Jimbo-Cho, Chiyoda-Ku, Tokyo 101. Phone: (03) 230-41170. Telex J26860.

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395151. Telex SECCO AA25468.

Brazil: Eric Hippeau, Data News, Computerworld do Brasil, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25/10th Floor 20031 Rio de Janeiro, RJ Brazil. Phone: (021) 240-8225. Telex 2130838 WORD BR.

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Sweden: Bengt Marcstedt, Computerworld/Sweden, Norra Medie AB, Vartavagen 55, 11538 Stockholm.

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IBM Information Network Now Accessible via Telenet

By Tom Henkel
CW Staff

RYE, N.Y. — IBM has announced that its Information Network can now be accessed through GTE Telenet, Inc.'s Telenet public network, a move at least one industry analyst thinks might signal the computer giant's move into the data transmission business.

By adding Telenet access, IBM has expanded to 250 the number of cities from which its remote computing service can be utilized.

In addition, IBM said it has opened three offices for its Information Network in Boston, Minneapolis and St. Louis.

Finally, IBM announced that users of IBM Personal Computers and 3101 terminals who access the Information Network now have full-screen capabilities available to them.

The Telenet-Information Network link is available only to users with asychronous, line-mode terminals. These include IBM's 2741, 3101, 3232-51, as well as IBM's Datamaster and Displaywriter systems and the IBM Electronic Typewriter 85.

In addition, terminals compatible with the Teletype Corp. 33/35 teletypewriter can be used to access the Information Network via Telenet.

The Telenet link is not available to IBM users with systems based on IBM's System Network Architecture, who typically use the Information Network for program development or to pick up applications not installed on in-house systems.

The Telenet connection offers Information Network customers located outside the 13 cities with Information Network offices a less expensive means of accessing the network. Those users previously had to make a long-distance call to an Information Network office to use the network.

There is a surcharge of approximately $6/hour for accessing the Information Network via Telenet.

The Information Network provides three basic remote computing services: programming tools for nonprogrammers; resources such as CICS development aids for DP professionals; and data banks.

The Telenet link could be the start of an effort by IBM to break into the data transmission field, speculated Charles Greco of International Data Corp. in Framingham, Mass. "It's a casual way of getting in . . . without making a lot of ripples," he said.

Ken Bosomworth, an analyst with Information Resource Development, Inc. in Norwalk, Conn., noted the Telenet link makes the Information Network more of a competitor with American Bell, Inc.'s Advanced Information Systems/Net 1000.

Nexis Offering On-Line Access To CW Stories

The stories that appear in *Computerworld* can now be accessed on-line via the Nexis data base service from Mead Data Central, Inc.

Users with a Nexis terminal can access nearly every story published in *Computerworld* beginning with the Dec. 27, 1982-Jan.2, 1983 "Forecast" issue. Subscribers can initiate searches by subject, topic or through almost any word in an article.

For example, if a user was looking for information on "local-area networks," within 15 seconds every story that contained those words would appear in one of three formats: by bibliographic listing, key word in context (the term and about 20 words on either side) or full text, with the most recent story first. The full-text version gives date, length, headlines and dateline, as does the key-word search.

In addition to CW, Nexis' data base contains more than 60 magazines and newspapers, the *Encyclopedia Brittanica, The Federal Register* and nine wire services. The New York Times Information Bank will be available next summer.

More information about the service can be obtained from Mead Data Central, which can be reached through P.O. Box 933, Dayton, Ohio 45401.

This Week

SPECIAL REPORT ON MICROS IN BIG BUSINESS . . . . Follows ID/24

IN DEPTH
Manual Dexterity . . . . Follows Page 60
BSP at Work ID/9
Three Essays ID/19

NEWS
Amdahl Plans Cure for 5860 Performance Lag 4
Rep. Bill Nelson and His Federal DP Crime Bill 6
AT&T Responds to Reorganization Critics 8
Communications Tools Debut at Interface 10
Attendees Focus on Micros, PBXs, Local Nets 11
Managers Urged to Be Corporately Involved 12
Keynoters Urge User-Oriented R&D 13
Managers Enthused About Personal Computing . . . 14
Info Center Managers Grappling With Micros 15
Dodge Assails State of Software Industry 16
N.J. Spending $22,000/Mo for Boxed DP Gear 17
Group Keeps Users From Feeling Left in Lurch 18
Martin Sees DP Languages in 'Chaos' Period 21
'Electronic Ball and Chain' Sparks Controversy . . . 23
Career of DP 'Prof.' Abends From False IDs 24
Exec Airs Aetna's Plan for More Tech Activity 25
Worker Satisfaction Seen Key to Productivity 26
Enhance MIS Image to Justify Costs: Consultant . . 27
Exec Projects Growth of Easy-to-Learn Micros 28
Methodology Boosts Group's Output 29
DP Center Grows With Cache, Not Disk 30
Food Chain Brings Decision Support In-House 31
Package Speeds Bank's Operations 32
System Helps Supplier Update Mail, Inventory 33
Scheduler Controls Hospital's DP Operations 34
Firm Finds New Backup System Worth Risk 35
Turnaround Time 37
Gas Pipeline Firm Fuels Conversion With System . . 38
Data Dictionary Cuts Red Tape for Blue Cross 40
Data File Helps Firm Keep Pace With Tax Rates . . . 41
Network Service Connects Agents 42
Package Saves $300,000 for Supermarket Chain . . 43
Navaho Children to Learn English With System . . . 44
Consumer Reports Surveys Hospital DP Gear 45
System Speeds Up Firm's Turnaround of Parts . . . 46
System Solves Growing Memory, Access Needs . . 47
Financial Tool Helps Publisher Streamline 48
POS Net Speeds Checkout for Resort's Guests . . . 49

EDITORIAL
Editorial: An Uneasy Silence 54
Softline: Australia: A Test Market for Japan 55
Human Connection: Not All Are Cyberphobiacs . . . 55
Getting Ahead in DP: Presentation Preparation 56

SOFTWARE & SERVICES
Financial Aids Seen Entering New Era 61
XP System Fits DOS/VSE, OS 62
Ingres Version 2.0 Announced for VAX-11 Users . . 66
Release 4.0 of 'Secure/CICS' Out 68
'MPEX/3000' Utility for HP 3000 Users Enhanced . . 69
Program Generator System Out for Burroughs 70

COMMUNICATIONS
Snet May Acquire 40% Interest of DTI 77
Stratus Unveils Adapter, SDLC Link, Others 78
Package Boasts IBM CPU, Ethernet Connection . . 81
Modem Runs at 300 Bit/Sec 83
Kimtron Unveils Update of ABM 85 Display Unit . . . 84
Canoga Data Systems Out With Fiber-Optic Mux . . 85

SYSTEMS & PERIPHERALS
Supermini Produces Fast Results for Firm 87
CDC Micro Boasts Multiterminal Capability 88
Fixed/Removable Disks Unveiled 89
Turnkey Mini System Out for Sales Reps 92
Keyboard Offers Multistation Keys 93

OFFICE AUTOMATION
Model 630W Printer Fits Wang 95
WP Package Out for System/34 100

COMPUTER INDUSTRY
McCormack & Dodge Corp. Is Acquired 101
IBM Charges Ex-Employees, Firm With Stealing . . 101
Exec Sees IBM Efforts Impacting PCMs 103
Exec Says IBM to Surpass Apple Micros 105
Rolm to Get 3270 Controller Savvy 108
Some Problems Seen With Rush to Automation . . 109
STC Lays Off 500 Workers 111

ADVERTISING INDEX 142

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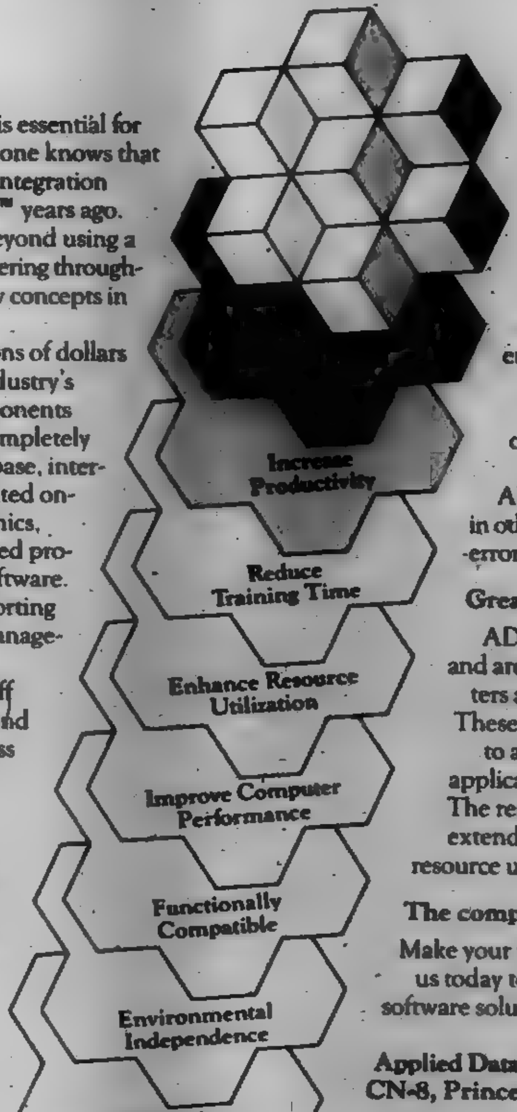
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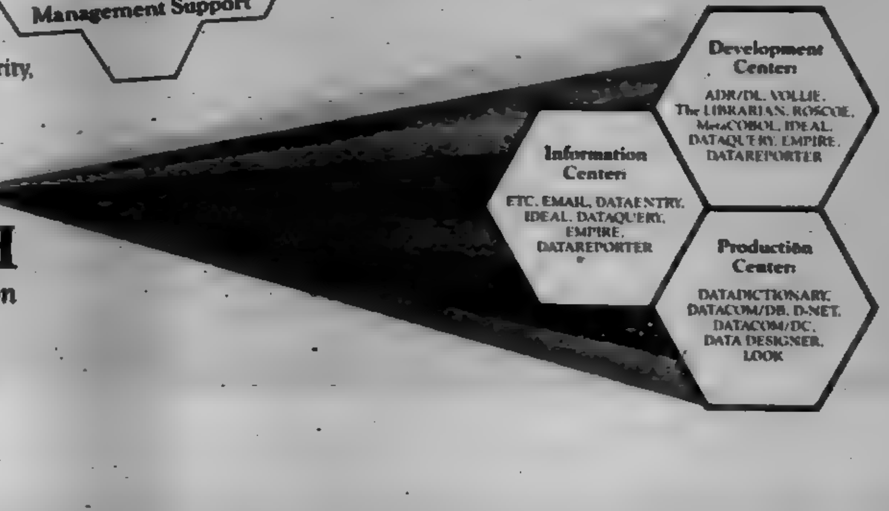
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Decline of Minis Could Not Have Been Predicted

20/20 HINDSIGHT

By Ed Scannell
CW Staff

Pity the poor prognosticators who peered into the minicomputer future three or four years ago and bravely went on record with their forecasts in the pages of *Computerworld* and other trade publications.

As it turns out, all the exponential curves, penetration models, econometrics, retrocasting and other forecasting tools could not have predicted what kind of havoc a protracted recession and the explosive growth of microcomputers would bring to their orderly calculations.

If analysts were overly optimistic in their predictions for minicomputer revenues and shipments for 1980 through 1982 — and they generally were — they had good reason. Realizing the minicomputer market had grown between 25% and 30% in each of the preceding four years (1975-1979), analysts had no reason to believe in 1979 and 1980 that the market would not continue to grow at the same pace for the next three or four years.

And with some of the major minicomputer manufacturers saying they were just beginning to scratch the surface of their market's potential at that point, some analysts felt their 30% growth projections for the early '80s were even a little conservative.

When the sluggish economy forced many users to delay their decisions to buy systems and when the price of microcomputers plummeted while their performance soared past most 16- and some 32-bit minicomputers, those 30% growth projections went from being a little conservative to being wildly optimistic.

One analysis firm that fell victim to the unforeseen growth of micros and the extended recession was Creative Strategies, Inc. (CSI), which predicted that worldwide minicomputer revenues would grow at an annual compound rate of 32.6% through 1984 [CW, March 24, 1980]. However, according to the company's own figures, the revenues for that market grew only 20% in 1981 and 12.5% in 1982.

"I think we underestimated the price elasticity and the snowball effect of the acceptance of microcomputers," said Tim Berry, a market analyst at CSI, explaining why his firm's minicomputer projections were off the mark. Microcomputer "prices came down and their performance went up faster than we thought they would."

CSI had also forecast that superminicomputers would constitute 10% of all minicomputer shipments and 35% of all minicomputer revenues by 1984. While he did not have any 1982 year-end figures, Berry said that at year-end 1981, superminicomputers made up 3% of the total installed minicomputer base and accounted for 15% to 20% of the revenues.

However, Peter Lowber, a senior market analyst at The Yankee Group, said CSI's 10% shipment and 35% revenue figures for 1984 may be too low. "Considering that this year will be the first full year of production for Digital Equipment Corp. VAX-11/730, Data General Corp. MV/4000 and Perkin-Elmer Corp. low-end minis, those revenue figures should be higher," he contended.

'IBM Fighting for No. 2 Mini Slot'

A third forecast made by CSI was that by 1984 "IBM will be fighting for the No. 2 slot in the mini market." According to CSI's 1981 figures, however, the chances of this prediction becoming a reality by next year are slim.

"Last year in a study, they [IBM] were No. 4 behind DEC, [Hewlett-Packard Co.] and DG. And they really haven't done much over the last year to change that," Berry noted.

CSI was not the only analysis firm to overrate IBM's future potential in the minicomputer market. Quantum Science Corp. predicted in 1977 that while IBM would never be the market leader, it would capture a 15% share of the market by 1981 [CW, April 11, 1977].

According to most analysts, this prediction was not even close. For instance, figures from International Data Corp. (IDC) show that at year-end 1981, IBM held a 4% share of the minicomputer market.

But some analysts say IBM's ranking in the minicomputer market depends on what is defined as a minicomputer in their product line, which appears to be no easy task. Some consider the Series/1 to be Big Blue's only minicomputer; others would include the System/34 and even the System/38 as part of IBM's minicomputer offerings.

"You really have to look at the non-IBM market figures and then throw in IBM's figures," noted The Yankee Group's Lowber. "In 1982, equipment figures [for non-IBM minicomputer makers] were $7.1 billion. But if you add in IBM's revenues, it comes to just under $11 billion."

While it was not as far off the mark as CSI, IDC also overestimated the recession-proof capabilities of the minicomputer market when it predicted that worldwide minicomputer revenues "will continue to show healthy, albeit slower growth, increasing 29% each year through 1983" [CW, April 7, 1980].

IDC analyst Aaron Goldberg said his company's worldwide minicomputer revenue figures for the years 1980, 1981 and 1982 show that the market actually grew by 23%, 16% and 20%, respectively, which averages out to 19.6% a year.

IDC also predicted in 1980 that in 1983, the minicomputer market would be worth $13 billion and there would be 235,000 units installed. According to IDC's latest figures, however, by year-end the minicomputer market will be worth $11.8 billion, "which is only off by 5% to 7%, and that is agreeable to us," Goldberg said.

For unit shipments, IDC has pared its original forecast down to 171,800.

"The economy caught us by surprise," Goldberg said. "The mini market looked a little better to us then [1980] — we didn't have supermicros to contend with."

Amdahl Plans Cure for 5860 Performance Lag

By Ed Scannell
CW Staff

SUNNYVALE, Calif. — Amdahl Corp. reported last week it has found a cure for the ills that prevented its 5860 high-end mainframe from realizing its performance potential.

According to Amdahl Marketing Director Wayne McIntyre, users have complained that the system takes too much time to access information from main memory that is not in cache memory when the processor is operating in a supervisor state. The cure consists of a series of engineering changes the company will build into future 5860s; they will be offered free to current 5860 users beginning next month.

Users of the 5860 were told of the system's shortcomings and the upgrades to correct them at a users group meeting last December, McIntyre said. A number of users have already undergone the first round of upgrades and are scheduled for a second round in upcoming months.

Amdahl delivered "a little more than a dozen" 5860s by the end of 1982 and has shipped "substantially more than that number" this year, according to McIntyre.

When the 5860 was announced in November 1980, Amdahl said the $3.8 million machine would have twice the performance of the firm's 470V/8 in typical commercial applications and would be 20% to 25% more powerful than IBM's 3081 Model Group K. However, a series of validation tests conducted last summer before the machine was shipped indicated that when it ran in supervisor state, the 5860 was a little less than 1.7 times faster than the 470V/8.

"We discovered that in supervisor state, there was a higher than expected overhead when data had to be dragged down from main storage that wasn't already in the buffer or the cache. That was one problem," McIntyre stated. "Problem No. 2 was [that] this was occurring more frequently than we thought it would."

The vendor has corrected the problem by reworking "a lot" of the machine's circuitry, enhancing 15 instructions frequently used by the 5860 in supervisor state and reducing the system's cycle time from 24 nsec to 23¼ nsec. According to McIntyre, benchmarks run on the 5860 with the enhancements show the system "is now in the same performance category as the 3081."

The first 5860 shipped, sent to the University of Michigan Computer Center (UMCC) last August, received its first series of upgrades in December. These involved installing new multichip carriers, which UMCC Associate Director Jeff Ogden described as the machine's building blocks, and new microcode.

The enhancements raised the system's processing speed from 1.32 to 1.42 times that of the 470V/8 and increased the number of users the system can support simultaneously from 350 to 420, Ogden said. The second series of upgrades is scheduled for May.

Ogden cautioned that UMCC's system should not be used as a barometer for measuring the effect the upgrades will have on other 5860s because, being the first system shipped, it is at a slightly lower engineering level than "almost any other" installed 5860. Furthermore, it runs under a proprietary operating system, not an IBM operating system.

IBM to Fix Micros On-Site

FRANKLIN LAKES, N.J. — IBM has added on-site maintenance to the service options for its microcomputers. The service is available for both home and commercial users of the Personal Computer and its newly announced XT processor.

Besides on-site maintenance, IBM also offers courier pickup and delivery, carry-in and mail-in service for the micros. The on-site service option, which is being offered in 38 of about 100 cities with IBM service/exchange centers, costs $329 annually for a Personal Computer with 64K bytes of main memory, a 160K-byte diskette unit, monochrome display and printer — about 25% more than the standard courier pickup option.

To use the service, a user would first call IBM's National Support Center and explain the problem. If the center determines that the user has exhausted all self-maintenance options, a repairman will be dispatched, IBM said.

On-site service is available only during regular IBM business hours. The response time for service calls depends on the user's needs and availability of service personnel, according to an IBM spokeswoman.

Cuts in NBS Under Study

(Continued from Page 1)

government can rely on the private sector for standards development: "It simply is not true; it can't be done." The Reagan proposal to cut the ICST budget, he said, "demonstrates a fundamental lack of understanding of what the role and function of ICST is all about."

ICST's "real function," according to Ross, "is rapidly evolving to be more of a center of expertise, a center for information, a technical resource for analysis [and] research and to act as an ombudsman for weak or diffused segments of vendors and users of everything related to computers and their use. No other government or private-sector organization duplicates or can take over this unique role."

Supporting Ross' argument, Florida State Sen. George Stuart Jr., who chairs a committee on the Florida legislature's use of DP, told the House subcommittee the ICST has been invaluable to his state's DP and telecommunications planning. "No single state could afford the luxury of a standards-setting agency," Stuart said. "If the institute were not in existence . . . who would we turn to for these standards?"

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(Continued from Page 1)

technical committee developing the standard. During that meeting, Ed Baldwin, the phone company's director of technology licensing, read a legal draft of the licensing terms.

According to Tom Hastings, committee chairman, the draft reads as follows: "Upon request, AT&T will grant nonexclusive royalty-free licenses under its patents to make, have made and use equipment solely to the extent necessary to implement the standard, but on condition that the requester grants to AT&T, for itself and its subsidiaries, royalty-free licenses of the same scope under the requester's patents."

This offer will be submitted to Ansi "within the next few days," Hastings said. He expects AT&T's terms to satisfy Ansi's requirement for reasonable licensing terms.

Hastings said a draft of the proposed standard should be completed by the end of May, as planned. It will have to be considered by several other groups, but final adoption of NAPLPS as a U.S. videotex display standard is likely by next summer.

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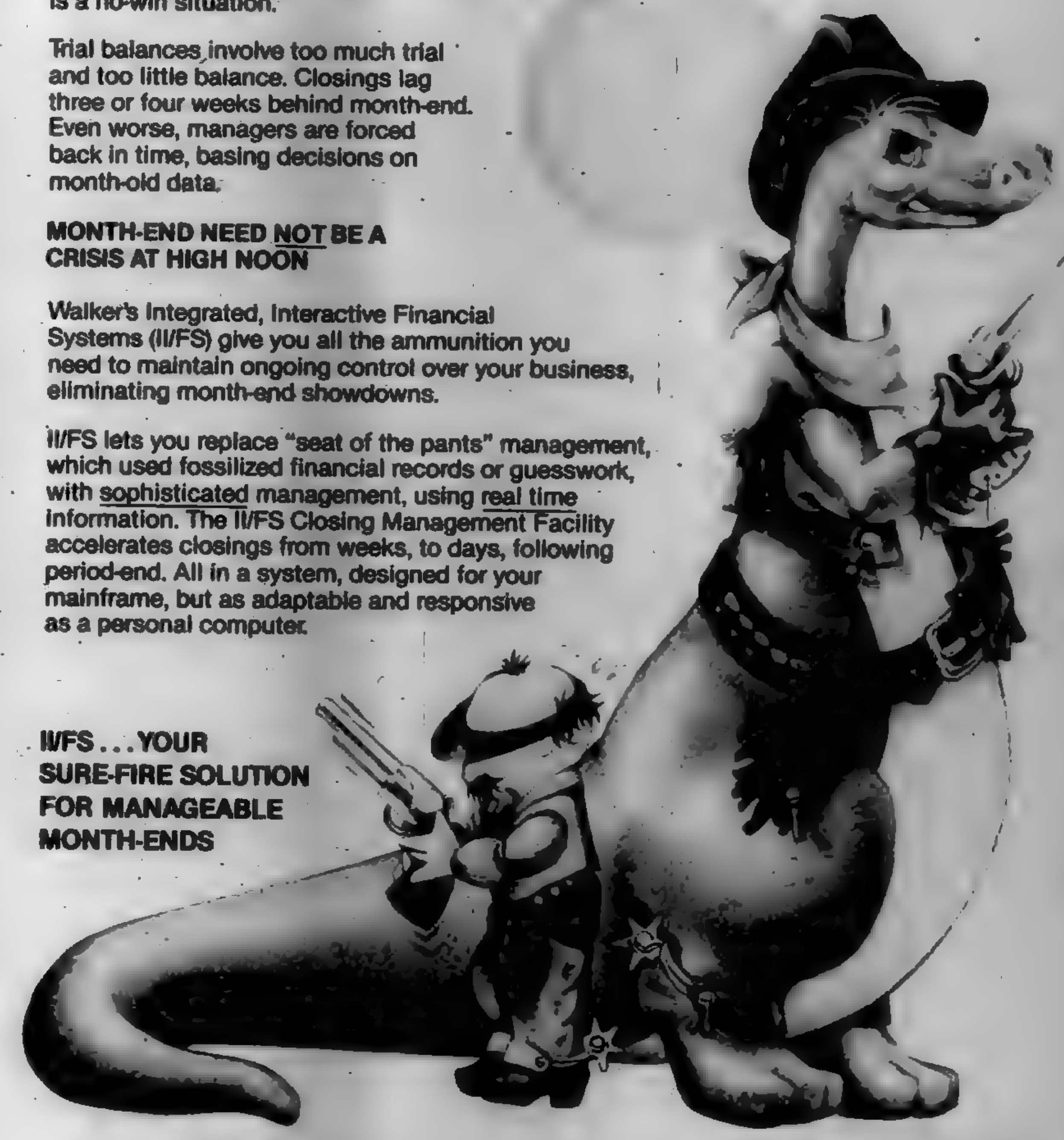

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Rep. Bill Nelson and His Federal DP Crime Bill

CW Photo by J. Bartimo

Rep. Bill Nelson (D-Fla.) reintroduced his computer crime legislation last month in the House of Representatives. The Federal Computer Systems Protection Act of 1983 (H.R. 1092) is an updated version of H.R. 3970, which was introduced by Nelson last season but not passed by the House.

This year's bill would make it a federal offense to tamper with the computers of the federal government, the computers of financial institutions guaranteed by the federal government and computers operating in interstate commerce or using interstate facilities. Such activities would be punishable by fines of up to $50,000 or twice the value of the property stolen, imprisonment for up to five years or both.

Nelson is the author of the Florida Computer Crimes Act, enacted in 1978 when he was a member of that state's legislature. The Florida statute was the first state computer crime bill passed in the nation.

Computerworld *senior writer Jim Bartimo recently visited Nelson in his Washington, D.C., office.*

What effect do you expect H.R. 1092 to have on computer crime?

This bill . . . is trying to update the criminal law for a specific kind of new high-technology crime that occurs because of the place of computers in our society. If a lot of the old laws on larceny do not specifically apply, then why not give the prosecutors new tools?

For example, let's say someone steals a tape with a $5 million program on it. Can a prosecutor under existing law prosecute on the value of the $5 million or on the $5.95 value of the magnetic tape?

The first incarnation of H.R. 1092 did not make it though Congress. What's different about this version that makes you think it will pass this time?

This version is basically the same as last year's version. We've tinkered on a few minor things. Basically, when you propose something that is new — state-of-the-art — you have to start an educational process. And so last year we tried to get the issue aired.

In House heatings in September, you received guarded support for H.R. 1092's predecessor from the Federal Bureau of Investigation and the U.S. Attorney General's office. Do you expect to have their support this time around?

Yes, and I don't think it was guarded support. In the testimony before that congressional committee, they came out and said, "We support this legislation." They may not have meant this specific piece, but they were saying that the subject this legislation addresses is one they think needs to be made into law.

Penalties for computer crime historically have been pretty low. Your bill only calls for a five-year prison term. Why is that?

Since we have the punitive provision of many times the loss of value, that is going to hit somebody pretty hard. Up to five years is a pretty punitive jail sentence.

If someone gets into national security-related crime, then there are other statutes upon which they could be given longer prison sentences. We think this meets the kind of penalty that would be a significant deterrent and yet not be judged to be overly punitive.

How would you answer your private-sector critics who call computer crime more of a management problem than a government problem?

I think it's a combination of both. I think it will always be a management problem. But, of his own fallible nature, man will continue to do bad things, and when man does, we have to have some way of saying that that is the kind of activity we want to prohibit in our society.

In private industy, computer crimes are not reported for fear of scandal . . .

And that's one of the problems of building enough evidence to say that you need this law. There are a lot of these crimes not reported, but let me say that there are a lot of rapes that are not reported either. But that is certainly not a justification to say that rapes should not be against the law.

I think this bill is another part in the process of informing the real world what is really happening. What is really happening is that these crimes are being committed every day — a lot of which we don't know about — and the severe consequences could threaten the financial integrity of companies, of government, international and national banking transactions, indeed, even the national security.

I assume the bill has been reintroduced to protect government computers and, therefore, government funds. Do you expect it to affect computer crime that does not involve government-related funds and computers?

The enactment into law of this legislation could have a deterrent effect. We know that computers are being used for crime. We know that a lot of states and the federal government do not have the up-to-date law to prosecute this highly sophisticated crime.

How would you control computer crime that does not involve the federal government?

That should be handled by state law, and we've done that in Florida.

What have you learned from looking at the other 18 state computer crime laws? What are their weak and strong areas?

I think there has been a general reluctance in the states for the prosecutors to prosecute under those laws because they know that the law is going to be tested in the courts. So if another statute under which to prosecute is available, they use that one.

So Far, 18 State Computer Crime Laws

When U.S. Rep. Bill Nelson pushed through computer crime legislation in his home state of Florida in 1978, the law was the first to address specifically computer-related crime. Two years later, nine more states had enacted similar laws.

Today, 18 states have passed specific computer crime legislation; by the end of the year, a total of 20 or more laws on DP crime are expected to be enacted.

The following — compiled with information from the U.S. Justice Department's *1980 Legislative Resource Manual*, from information provided by the Computer and Business Equipment Manufacturers Assoiciation in Washington, D.C., and from information provided by the National Center for Computer Crime Data in Los Angeles — is a list and description of the 18 current computer crime laws:

- **Arizona.** H.B. 2212 defines types of computer crimes and specifies if the crime is first or second degree. Penalties are five years' imprisonment for first degree felony and 1½ years for second degree.
- **California.** H.B. 66 makes it illegal to use, directly or indirectly, a computer, computer system or network for a crime. It was amended to include programmable calculators. The law calls for penalties of 16 months to three years in prison, fines of $2,500 to $5,000 or both.
- **Colorado.** H.B. 1110 defines the specifics of computer crime, breaking it into misdemeanor and felony offenses. Penalties of less than $50 to just under $200 can be imposed for a misdemeanor and $10,000 or more for a felony.
- **Delaware.** H.B. 730 is based on the Florida computer crime bill.
- **Florida.** H.B. 1305 defines types of computer crimes and addresses trade secrets. Penalties greater than $1,000 can be imposed, depending on the degree of the felony charge. Prison terms of one to five years may also be imposed.
- **Georgia.** S.B. 198 prohibits computer fraud and the defacement of computer systems and networks.
- **Illinois.** H.B. H.1027 makes it illegal to alter computer programs without the consent of the owner. Penalties of $1,000 or less are imposed for a misdemeanor charge and penalties of more than $1,000 are imposed for a felony.
- **Michigan.** H.B. 4112 prohibits computer fraud by defining it as illegal access to a computer. If the violation involves $100 or less, the offender is guilty of a misdemeanor. If the violation involves more than $100, the offender is guilty of a felony that is punishable by imprisonment for not more than 10 years, a fine of not more than $5,000 or both.
- **Minnesota.** S.B. 381 defines the offenses that constitute computer abuse.
- **Missouri.** S.B. 559 relates to computer systems, networks, equipment and suppliers with penalty provisions.
- **Montana.** H.B. 621 defines and prohibits computer-related crimes and imposes a statute of limitations that hinges on discovery of the act.
- **North Carolina.** H.B. S.397 deals with computer access, damages and extortion.
- **New Mexico.** H.B. S.8 makes the misuse of a computer a crime and addresses unauthorized computer use. A penalty of $100 or less is imposed for a petty misdemeanor. A fine of more than $2,500 may be imposed for some felony charges.
- **Ohio.** H.B. 437 expands the definition of the criminal code to cover computer crime.
- **Rhode Island.** H.B. 5775 is similar to California's computer crime law but does not include microwave communications in the definition of computer network. For a felony charge, an offender can be fined not more than $5,000, imprisoned for not more than five years or both.
- **Utah.** H.B. 183 is the Computer Fraud Act, which addresses services, property, computer networks, computer access, financial instruments, software or programs. Penalties between $25 and $300 may be imposed for a misdemeanor charge; penalties greater than $300, but less than or equal to $1,000, may be imposed for a felony.
- **Virginia.** — H.B. '39 defines computer crime as computer or data processing services or data connected therewith that is subject to larceny, embezzlement or false pretense.
- **Wisconsin.** H.B. 744 creates criminal penalties for the modification or destruction of computer programs or systems.
- **Alaska.** This state has a law concerning the fraudulent use of a vending machine, turnstile or computer. More specific legislation is pending.

Brokerage Firm Rejects Micros

(Continued from Page 1)

minals' intelligence, Epstein said. The transplant calls for each of Hutton's 350 branch offices to be equipped with a 2M-byte Data General Corp. Eclipse MV/4000 supermini.

Together, the 350 superminis will connect to the 5,000 dumb terminals and "will give them some additional smarts," Epstein explained. The aim of Hutton's proposed supermini installation effort is to transform the firm's existing terminals into personal computer look-alikes that can offer all of a micro's characteristic strengths with none of its attendant weaknesses.

Acquisition of the DG machines will mark yet another advance in the continuing development of the brokerage house's existing Compass teleprocessing network, which already consists of multiple layers of systems resources. At the apex of the Compass hierarchy is a complex of IBM 3033 and 3083 mainframes, all housed in the company's world headquarters in New York.

On the second level is an installed base of 26 integrated Eclipse mainframes divided among 16 remote sites, including Hutton's 12 U.S. regional offices. On the third level is the firm's distributed information network, which consists basically of the 5,000 dumb terminals.

Now, with the proposed installation of the 350 MV/4000s, Hutton intends to add a fourth processing layer to the Compass network and in so doing "move intelligence down to the terminal level," Epstein said.

The Advantage: Control

The advantage of the company's current teleprocessing scheme is that it maximizes central control, ensures data consistency and readily accommodates future growth. So by preserving its existing terminals and enhancing them with increased local intelligence, Hutton can retain the Compass network's original virtues and at the same time add to its capabilities, Epstein said.

But if the firm were to modify its established systems framework significantly, it would restrict its communications, greatly complicate expansion problems and lose both central control and data consistency, he added. In short, the brokerage house would forfeit many of the Compass network's current benefits.

Why is Hutton bucking what may be the most popular trend in corporate computing?

For jobs that require little supervision and have minimal impact on other corporate operations, personal computers may prove to be an effective way of doing business, Epstein admitted. "But if what you want is integrated solutions, personal computers can be a real problem."

Although microcomputers themselves will apparently play only a minor role in the firm's long-range systems plans, Hutton intends to continue its policy of broadening its users' access to on-line computing resources. "We want to extend personal computing power as far down into our organization as we can go and still maintain central control."

Rejection of Micros Draws Astonishment

SAN FRANCISCO — A controversy erupted last week in the wake of E.F. Hutton, Inc.'s startling announcement here at a personal computing conference that it plans to discourage the widespread in-house use of personal computers.

The disclosure by Norman Epstein, Hutton's executive vice-president of operations, drew potshots from many of the 150 attendees of Future Computing, Inc.'s Fortune 1,000 Personal Computer Market Forum.

A few of the attendees, particularly vendors, reacted to Epstein's disclosure with astonishment. Others voiced serious doubts about whether the firm's personal computer policy could be effectively enforced, especially now when user demand for business-oriented micros is rapidly growing.

Typical of some of the skeptics was James Bandy, manager of new business development for Softech Microsystems, Inc., a licensed supplier of the UCSD P-System program. During a March 23 presentation, Bandy cited evidence to suggest that Hutton's end users may simply ignore their employer's efforts to control the firm's personal computer population and install the machines secretly.

"Our company has just recently signed an agreement with E.F. Hutton to supply the P-System for the hundreds of personal computers the firm has already installed and the hundreds more it now has on order," Bandy said. "I'm not at liberty to say where in E.F. Hutton the systems are going to be installed. I'll let [Epstein] find out for himself."

Bandy's comments came in response to Epstein's March 21 statement that Hutton intends to use time-shared minis rather than desktop micros as the chief medium for making personal computing capabilities available to its users.

Though perhaps unconventional, the brokerage house's strategy for implementing personal computing is by no means unique. A similar plan has also been adopted by the Metropolitan Life Insurance Co., according to president of Future Computing, Dr. Portia Isaacson.

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Judge Gets 600-Page Report

AT&T Responds to Reorganization Critics

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — AT&T has answered the critics of its proposed reorganization plan by submitting a response of more than 600 pages to federal Judge Harold H. Greene.

The reorganization plan, which would carry out the settlement of the U.S. vs. AT&T antitrust case, must be accepted by Greene before it can be implemented.

One criticism of the reorganization plan addressed by AT&T in its March 14 submission is that the plan will enable the phone company to impose unfair restrictions on users of switched and nonswitched private line services, as well as competing suppliers. AT&T, according to its critics, will be able to limit the user's freedom to choose terminals and services and restrict competing suppliers' freedom to market those products.

AT&T will allegedly gain this power by terminating the subscriber's access line directly in a network interface owned by its Long Lines Division, rather than by a divested Bell operating company. The critics pointed out that a major goal of the government's antitrust case against AT&T was to erase the phone company's end-to-end control over the subscriber's message path.

This was essentially done when Bell agreed in the antitrust case settlement to divest the operating companies that supply the end portions of that path. Critics fear, however, that while the Bell operating companies will own the access lines, AT&T, through its control of the network-side termination, will be able to specify the protocols that must be used and give some users better service than others — for example, quicker response to service calls and better quality access circuits.

AT&T's Answer

AT&T's general answer to this complaint was that network facilities have been allocated on the basis of predominant use. In regard to switched private line services — specifically the Enhanced Private Switched Communications Service and Common Controlled Switching Arrangement — the company said, "There is no question that if a predominant-use test could be conducted, the test would show these switching systems are predominantly used for inter-Local Access and Transport Areas [long-distance] functions."

However, Satellite Business Systems (SBS) saw an inconsistency in the allocation scheme. It pointed out that after divestiture, Bell operating companies will own all of the Class 5 offices that handle local dial-up service, even those combined with Class 4 offices that process long-distance calls. (Class 5 offices are the ones closest to the end user; they are connected, on the network side, to Class 4 offices.)

In the case of Dataphone Digital Service (DDS), the Bell operating companies will own only those hub offices where the bulk of the traffic is locally terminated; AT&T will retain those hub offices handling both local and long-distance traffic.

As a result, the phone company will continue to own about half the 91 DDS hub offices now in service. And although the Bell operating companies will own the other offices, AT&T will own any DDS access line termination facility within those offices that is used predominantly for long-distance traffic. (The reorganization plan refers to these facilities as "points of presence.")

According to SBS and other critics, this means that Long Lines will retain control over most DDS access lines. AT&T's response was that "unlike the case with switching systems, assignment of all of the interexchange DDS hubs to the Bell operating companies would leave no capability . . . to offer unique or distinct services. The interexchange carriers would service only as transmission links."

Opinions Vary Widely on AT&T's Image

(Continued from Page 1)

AT&T is trying to dump its outdated customer premises equipment (CPE) on an unsuspecting market so that American Bell, Inc. will not have to absorb it when the newly formed subsidiary of AT&T assumes responsibility for Bell's CPE next Jan. 1.

"It's the old AT&T migration strategy in reverse," Kramer declared. The migration strategy he referred to alleges that AT&T is forcing its customers to buy new CPE by charging exorbitant amounts of money to maintain older equipment. "You will be offered cheap prices on horse-and-buggy products," he warned.

The attorney asserted that CPE will be sold for less than it is worth and ratepayers will become "unwitting victims of a marketing strategy." They will be victimized because they will have to pay higher rates to offset AT&T's losses on the customer premises equipment, and the CPE they buy will not last for long, putting customers in the position of having to replace it with more expensive equipment in the relatively near future, Kramer claimed.

He also said that the proposed AT&T reorganization plan subverts the "competitive thrust" of the agreement reached by AT&T and the U.S. Justice Department to end the U.S. vs. AT&T antitrust suit.

Lawrence Garfinkel, AT&T assistant vice-president, admitted there will be "confusion" and "a bewildering array" of products and services available in the deregulated communications marketplace, but claimed that AT&T is an ethical organization that only asks that it be allowed to compete on an equal footing with other companies.

"Our competitors can expect tough, fair competition," he stated.

The regulatory process is used by some people against AT&T because they do not want it to be competitive, he maintained, adding that suppliers should be able to compete, not find a regulatory niche that protects them. Deregulation must occur as quickly as possible, but in an orderly fashion, allowing both suppliers and consumers to adjust, Garfinkel said.

In a truly competitive environment, users will be the big winners as companies strive to offer the most sophisticated products and services at the lowest prices, he observed.

J. Robert Harcharik, vice-president of data services for MCI Communications Corp., said whoever controls the transmission facilities controls availability and prices. According to Harcharik, value-added carriers such as Tymnet, Inc. and GTE Telenet Communications Corp. will pay up to seven times more for local line access charges after the final Bell breakup.

The time to make up ground on AT&T is now, during the state of transition, because "AT&T moves slowly and understands monopolistic omnipotence," Harcharik claimed. Would-be competitors should choose highly specialized market areas that shelter them and then plan "relatively small, highly profitable businesses," he advised.

He played down advanced bypass services such as digital termination systems, saying local telephone companies will control local access for years. He also predicted that wideband digital communications will be slow in coming. "Current communications facilities will dominate for many years," he maintained.

The role of public utility commissions will become increasingly important as they are called on to regulate local communications distribution, Harcharik said. He questioned their readiness to assume such a role.

Corrections

International Software Enterprises, Inc.'s multiuser versions of Micro Data Base Systems, Inc.'s MDBS III data base management system for 16-bit microcomputers [CW, March 7] are priced from $3,000 to $10,000. The vendor is based at Suite 400, 85 W. Algonquin Road, Arlington Heights, Ill. 60005.

In "Designer Cuts Processing Time" [CW, Jan. 31], it was incorrectly reported that Database Design, Inc.'s Data Designer runs on Burroughs Corp. and Sperry Univac systems. The package runs only on IBM and plug-compatible processors and Digital Equipment Corp. VAX-11 superminis.

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Short-, Long-Haul Communications Tools Debut

By Jim Bartimo
CW Staff

CW at Interface '83

MIAMI BEACH, Fla. — Both short- and long-haul communications shared the spotlight here last week at the Interface '83 conference and exposition as a cast of local-area networks, modems, multiplexers and controller units made their debut.

Infotron Systems Corp. took the stage with its Infotron Local-Area Network, a ring-topology network that supports up to 2,000 simultaneous connections of synchronous and asynchronous devices at speeds up to 64K bit/sec.

By routing connections through the network, terminals or computer ports can communicate with other compatible terminals or ports. Each termination point can be made without restricting access to a particular port group or computer.

An average configuration is available for $15,000 from the vendor at Cherry Hill Industrial Center, Cherry Hill, N.J. 08003.

Ungermann-Bass, Inc. took its local-area network, very large-scale integration network interface chip set on the road a year after its announcement. Designed for the vendor's Net/One network, the NIU-150 interface chip connects clusters of six RS-232 devices to the network.

Two versions of the chip interface are available, one for 10M bit/sec Xerox Corp. Ethernet-compatible baseband versions and one for CATV broadband versions. The NIU-150 is available for $2,800 from the vendor at 2560 Mission College Blvd., Santa Clara, Calif. 95050.

Avanti Communications Corp. brought out its Ultramux time division multiplexer said to mix voice, data and video transmissions at 10M bit/sec over high-speed digital circuits. Designed for point-to-point communications, the multiplexer can split signals into as many as 128 lower speed communications channels and can take advantage of satellite, microwave and fiber-optic circuits, a spokesman for the vendor said.

The Ultramux will be available in the fourth quarter for $16,000 for a 16-channel system and $42,000 for a 64-channel system. More information is available from the vendor located at Aquidneck Industrial Park, Newport, R.I. 02840.

(Continued on Page 11)

Packages Include IBM CPU Links

MIAMI BEACH, Fla. — A number of communications software packages — many designed to connect microcomputers and workstations to IBM mainframes — were among the plethora of products introduced here last week at Interface '83.

Digital Equipment Corp. announced that it would market an IBM communications package jointly with Polygon Associates, Inc. The package allows batch and interactive block mode terminal access between the DEC Rainbow 100 personal computer and IBM mainframes, a DEC spokesman said.

The Poly-BSC/RJE package enables the Rainbow 100 to emulate the IBM 2780 data transmission and the IBM 3780 data communications terminals. It will be available in May and will be priced from $500 to $595. More information is available from DEC in Maynard, Mass. 01754.

Convergent Technologies, Inc. introduced a package said to allow its distributed IWS and AWS desktop workstations to communicate with IBM mainframes in a network using IBM's Systems Network Architecture (SNA) protocol. CT-SNA features emulation of the IBM 3270 terminal.

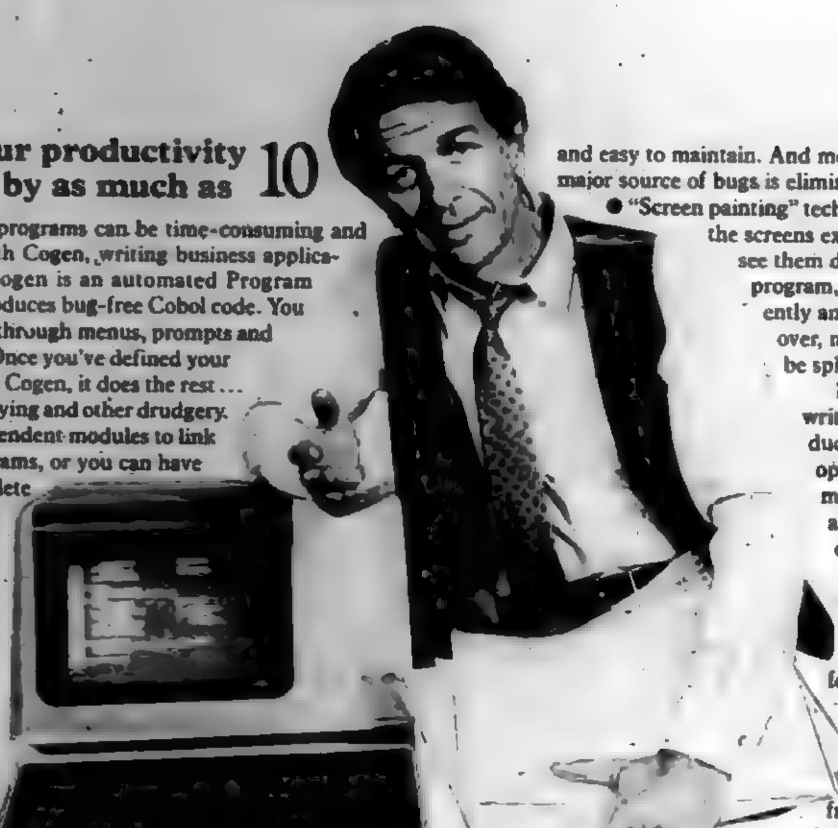
The package is available for $40,000 when bundled with the vendor's network gateway. More information is available from Convergent Technologies' headquarters at 2500 Augustine Drive, Santa Clara, Calif. 95051.

Honeywell, Inc. announced new releases of its Distributed Systems Architecture (DSA) software. Among the releases was Version 3.0 of the DPS6-DSA, a collection of software for networking DPS-6 and Level 6 minicomputers without the need for a mainframe. The DPS 6 may now function as both a switch and an endpoint in a DSA network, a Honeywell spokesman said.

The software is said to offer increased support for value-added networks and public data networks. It is available for an annual license fee of $790 with additional fees for optional modules. More information is available from Honeywell through P.O. Box 8000/T-60, Phoenix, Ariz. 85066.

Votan unveiled its Voice Operating System for its VX Series of voice processing systems and for the IBM Personal Computer. The package is a software design tool for programmers who need to design voice I/O.

One part of the package, the Dialog Builder, allows the programmer to define a dialog, enter voice data and generate and execute code for an application. It is available for $2,000 from the vendor at 4487 Technology Drive, Fremont, Calif. 94538.



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No Longer 'Blue Sky'

Attendees Focus on Micros, PBXs, Local Nets

By Bruce Hoard
CW Staff

MIAMI BEACH, Fla. — Personal computers, voice/data private branch exchanges (PBX) and local-area networks were mentioned regularly last week when attendees at the Interface '83 conference here were asked about the most important trends in data communications.

Those technologies have moved from the "blue sky" category into the real world; the users interviewed indicated, because they affect users on the job.

When asked to describe important trends, John A. Hill wrapped up all three of the emergent technologies. Important trends include "probably going to voice over data on digital PBXs. Local-area networks and large-scale integration are also very important," according to the Vought Corp. data communications manager.

"The generic terminal concept" is bursting upon the communications scene quickly, he added, and his company is moving to use such devices "because we want scientists and engineers to have personal computers."

Al Naseef, scientific programming specialist with Lockheed Electronics Corp. in Plainfield, N.J., noted how information services that were too intimidating and expensive five years ago are "casual entities" today. Naseef works in a mainframe environment but, he said, "Today, I have several microcomputer systems available to me."

When asked about important trends, David McNamara, an engineer with the John J. McNamara Electronics Co. in Riverside, R.I., said, "I guess high speeds, more network control and local-area networks." He lamented the sluggish emergence of standards for local-area networks, noting, "They're not coming fast enough. As a result, organizations are holding back."

IBMer Don Phillips said "remote computing going toward personal computers interfacing out of the mainframe" is an important trend. Phillips, who has a personal computer at home, said using it can be a time-consuming task. "You have to work with it quite a bit," he noted.

Bob Rathke of Rochester, N.Y., talked about decentralizing computer systems when he commented, "I think about getting away from the IBM hierarchical style of systems that are prone to single points of failure." The senior analyst at Rochester Gas and Electric Corp. cited the movement toward protocol conversion and universal communications between disparate devices.

CW at Interface '83

Rathke said the demand for personal computers in his organization is growing. "We see the personal computer perhaps replacing the traditional terminal," the senior analyst observed.

The failure of data communications companies to provide products that meet users' needs was on the mind of Dick Torborg, associate director of corporate development at Dynatech Corp. in Burlington, Mass. "They release products that don't really meet customers' needs," he declared. "Not too many companies do that right."

Bruce Torello, senior network consultant with Dunsnet in Wilton, Conn., cited voice/data integration and packet switching as "the two big things I see." He also mentioned satellite communications.

Bevy of Products Debut at Meet

(Continued from Page 10)

Codex Corp. introduced its 224 Modem, designed for full-duplex communications on two-wire circuits and said to transmit data at 2,400 bit/sec. It is a Bell Laboratories 212-compatible modem.

Single-unit price for the Codex modem is $1,195 and it is also available for a two-year lease of $54/mo. Codex is based at 20 Cabot Blvd., Mansfield, Mass. 02048.

Intertel, Inc. brought the curtain up on its NCM 14400 Modem, said to be capable of transmission speeds of 14,400 bit/sec. It operates over both domestic and international private lines.

The modem will be available in May for $7,650 from Intertel, 6 Shattuck Road, Andover, Mass. 01810.

In a move designed to upstage coaxial communications, Fibronics International, Inc. introduced its Cable Bandit coaxial cable/fiber-optic multiplexer. It is said to eliminate the need for 31 coaxial cables by multiplexing 32 outputs from IBM 3274, IBM 3272, System/34, System/38 and other controllers into one fiber-optic cable.

The Cable Bandit is available for $5,000 from Fibronics, 218 W. Main St., Hyannis, Mass. 02601.

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Managers Urged to Become Corporately Involved

CW at Interface '83

By Bruce Hoard
CW Staff

MIAMI BEACH, Fla. — Managers must aggressively insert themselves into their companies' futures and "become consultants to [their] own corporate clients," according to Charles E. Yates, assistant vice-president of market planning for AT&T.

Yates delivered this advice last week to an audience here at the Interface '83 conference and exposition. During his session, titled "Strategies for Information Management," he also discussed trends and changes in the information industry that have made such personal intervention possible.

The most prominent trend is the continuity of change, Yates said. Constant flexibility is required if companies are to avoid the abyss that separates success from failure.

Mergers and acquisitions are one form of change for which DP and communications managers must be prepared. As corporations seek new identities, it is incumbent upon information managers to keep their systems up to date, he observed.

Proactive, as opposed to reactive, thinking is difficult for information managers because many have seen their careers move through relatively sedentary levels. They are required to think and plan ahead more than ever before, Yates said.

Technology and its variations are the largest components in the change equation, he said. If managers are anything less than dedicated to staying on top of new technologies, they risk failure in their efforts to assert control, he stressed.

The willingness of suppliers to pay attention to individual customers is encouraging, Yates said. Especially in the area of networking, users can use all the help they can get.

The deregulated, restructured communications environment is confusing and will remain so until some time after next Jan. 1, when AT&T is finally reorganized, he said. In the interim, users should resign themselves to a multiplicity of products and services from a variety of companies.

Yates told his audience to adopt a "co-supply philosophy," whereby different companies offer "synergistic" components for the good of users.

Don Smith, an internal consultant with Merrill Lynch, Pierce, Fenner and Smith, Inc., agreed with Yates' explanation of deregulation effects, saying the situation "will get worse before it gets better."

The proliferation of desktop and personal computers has intensified the problem of protocol incompatibility, Smith commented. According to him, many people do not appreciate what a problem compatibility is.

He also suggested starting out with a pilot project when moving into the local-area network area, saying, "local-area networks are here to stay." Such a pilot project need not be expensive if the user relies on equipment already on hand along with some leased equipment.

"You don't have to end up in the mud with arrows in your back if you do it right," Yates observed.

Speaker Pushes Balanced DP

By Jim Bartimo
CW Staff

MIAMI — "People just want to get the job done," according to Pete Moulton. "That's why personal computers are so popular. People look at them and say, 'I can get a lot of work done with one of those.' "

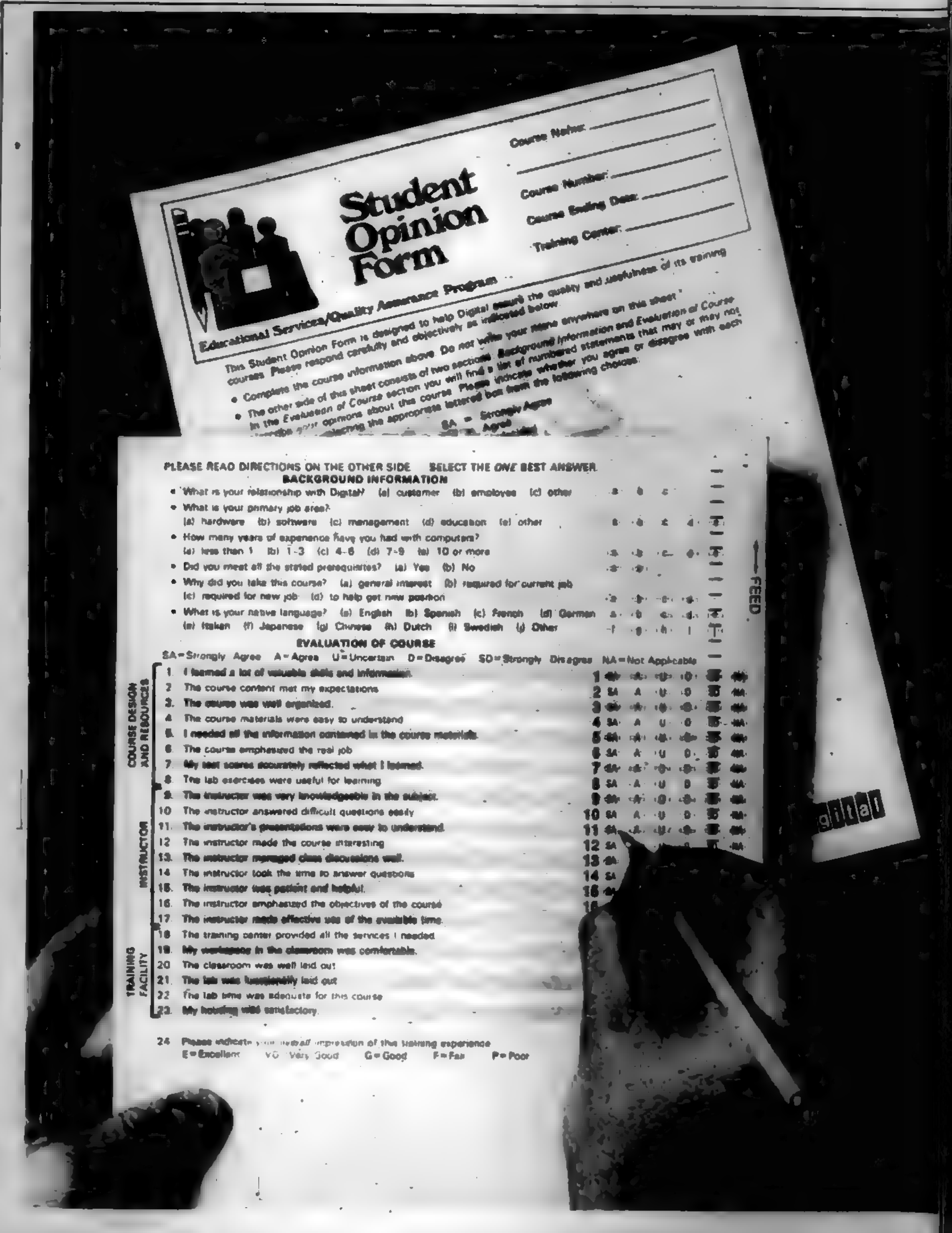
Speaking on desktop computers and intelligent terminals last week at Interface '83, the consultant from the Columbia, Md. firm of Moulton and Co. also said that the "job" can be accomplished only through "balanced computing."

"Balanced computing is when the systems structure reflects the organizational structure," Moulton explained. "We have computers at all organizational levels, but the systems should be a mirror image of the organization."

Many vendors provide methods of constructing systems architecture, Moulton said, but that is only half the problem. IBM's Systems Network Architecture "is an excellent technical description of how to design communications software and tie mainframes together, but it doesn't address managerial issues."

These managerial issues will become more important to businesses as personal computers and intelligent terminals pervade the office — when, for example, micros are tied into the corporate mainframe. There must be a cooperative effort between managers and the DP department to accomplish this, he said.

But the job will have its obstacles. Compatibility and communications problems will need to be addressed, as will "industry inertia" which, Moulton said, is evident when the mainframe vendor creates problems in interfacing micros simply because the mainframe vendor dous not make any money on the micros.



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- What is your primary job area? (a) hardware (b) software (c) management (d) education (e) other
- How many years of experience have you had with computers? (a) less than 1 (b) 1-3 (c) 4-6 (d) 7-9 (e) 10 or more
- Did you meet all the stated prerequisites? (a) Yes (b) No
- Why did you take this course? (a) general interest (b) required for current job (c) required for new job (d) to help get new position
- What is your native language? (a) English (b) Spanish (c) French (d) German (e) Italian (f) Japanese (g) Chinese (h) Dutch (i) Swedish (j) Other

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COURSE DESIGN AND RESOURCES

1. I learned a lot of valuable skills and information.
2. The course content met my expectations
3. The course was well organized.
4. The course materials were easy to understand
5. I needed all the information contained in the course materials.
6. The course emphasized the real job
7. My test scores accurately reflected what I learned.
8. The lab exercises were useful for learning

INSTRUCTOR

9. The instructor was very knowledgeable in the subject.
10. The instructor answered difficult questions easily
11. The instructor's presentations were easy to understand.
12. The instructor made the course interesting
13. The instructor managed class discussions well.
14. The instructor took the time to answer questions
15. The instructor was patient and helpful.
16. The instructor emphasized the objectives of the course
17. The instructor made effective use of the available time.

TRAINING FACILITY

18. The training center provided all the services I needed
19. My workspace in the classroom was comfortable.
20. The classroom was well laid out
21. The lab was functionally laid out
22. The lab time was adequate for this course
23. My housing was satisfactory.

24. Please indicate your overall impression of this training experience
E = Excellent VG = Very Good G = Good F = Fair P = Poor

CW Photo by J. Bertino

James M. Hewitt

Saying Next Decades to Be User-Driven, Keynoters Urge User-Oriented R&D

By Bruce Hoard
CW Staff

CW at Interface '83

MIAMI BEACH, Fla. — The information age of the '80s and '90s will be end-user driven, stressed William Stritzler, vice-president of finance, planning and administration for American Bell, Inc., and James M. Hewitt, general manager of IBM's Information Network. Stritzler and Hewitt shared keynote honors at Interface '83 conference and exposition here last week.

Citing "the incredible wealth of technology" available, Stritzler predicted that users will pull technology along as demands on them to remain current and competitive intensify. Repeatedly stressing the importance of users, he called on suppliers to join them in a partnership aimed at improving productivity. He also urged more user-oriented research and development.

"Users, managers, corporations, R&D organizations and information suppliers that follow this joint information-gathering approach will stand head and shoulders above the competition in today's marketplace," he stated. Productivity is the logical result of such a partnership because products with the broadest uses are those that are merged with the needs of users, he noted.

Demands on computer and communications managers will increase sharply as one out of every three white-collar workers gets a terminal on his desk by 1985 and the personal computer market balloons to $21 billion by 1986. "Computers in general are being born faster than babies," Stritzler remarked.

IBM's Hewitt also called for end-user orientation, saying the computer industry has grown rapidly because it has nourished user needs. However, demands in that area will accelerate precipitously as the more complex applications of the '80s require more and more knowledge. "We clearly need friendlier systems," he commented.

Hewitt referred to the "increasingly intertwining relationship between computers and communications," suggesting the two disciplines are both competitive and complementary. As an example, he said that IBM and AT&T are each others' competitors and customers.

In order to make the transition to the information age a smooth one, an architecture that will allow anybody-to-anybody communications must be built, Hewitt maintained. It is not enough to design computer systems that provide only universal intracompany communications. Intercompany communications should be the goal, he declared.

Hewitt said that no matter which particular networking strategies come to the fore, an architecture that will facilitate them all must be constructed. Then users can make their own decisions.

"Solutions will have to evolve around economics, flexibility and capacity for growth," Hewitt said.

The sophisticated nets evolving now will be heavily dependent on equally sophisticated network management technology, he said, calling network management "perhaps the biggest challenge of the '80s." He singled out network software as a complex area that has a strong need for more user friendliness.

CW Photo

William Stritzler

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DP Managers Enthusiastic About Personal Computing

(Continued from Page 1)

(29.6%) have a combination of personal computer users remotely linked to the mainframe and standalone. And while most foresee a future of "personal computers networked to a common data base," only seven (4.8%) respondents now have only personal computer users who are remotely linked to a mainframe.

MIS and Micros: Good Relations?

How will the relationship between personal computer users and the management information systems (MIS) department evolve over the next 10 years?

In response to that question regarding their own firms, 71% (157) of the 220 *Computerworld* readers recently surveyed by mail expressed enthusiastic belief in the growth of end-user personal computing, while 25% (55) believe it will not happen in their firms, will happen very slowly and/or will place greater demands on the MIS function.

Twenty of the 212 who answered the question expressed positive views while adding a caveat regarding possible problems of control or management.

"I'm a little apprehensive when it comes to end users building their own small subsystems, then coming to me to integrate them with the mainframe data base," noted a DP manager in manufacturing. "There I fear data flow and data security problems will arise."

"Unless strict controls over program development are initiated, redundant efforts will prevail and costs will skyrocket," warned Jon Tanner, MIS/DP manager at Optoelectronics in Richardson, Texas.

In contrast to those who feel that personal computers will place greater demands on MIS, many managers believe the use of personal computers by end users will instead relieve the DP department of many tasks it would gladly escape, as well as foster cooperation between the two.

"With the power of the micros increasing and more advanced software, we will see much more distributed processing, relieving our central computer of much of its current work load — editing, word processing [and so on]," predicted Steven Hare, manager of computing services for Pritsker & Associates, Inc. in West Lafayette, Ind.

An anonymous respondent wrote: "There will be battles for a while, then better relationships as users become more knowledgeable and cooperate with security measures, compatibility [and so on]."

According to the DP audit manager for a Minneapolis-based wholesale/retail firm, the relationship between end users and DP will result in "total alienation unless attitudes change. Personal computers allow users to strike back at DP for what they see as uncaring and unresponsive attitudes by DP for the users."

Of the 95 users with only standalone personal computers, 27 (28.4% of the 95) indicated they have had "some" data flow problems and three (3.1%) said they have "serious" problems of data flow. Fourteen (14.7%) managers in that category have "some" data security problems and two (2.1%) have "serious" security problems.

Of the seven managers with only remote personal computers linked to mainframes, only one indicated he has "some" data flow problems, and only one has "some" data security problems.

Twenty of the 43 (46.5% of the 43) managers with a combination of stand-alone and linked personal computers have experienced "some" data flow problems, while one (2.3%) has had "serious" problems in that area, according to the survey.

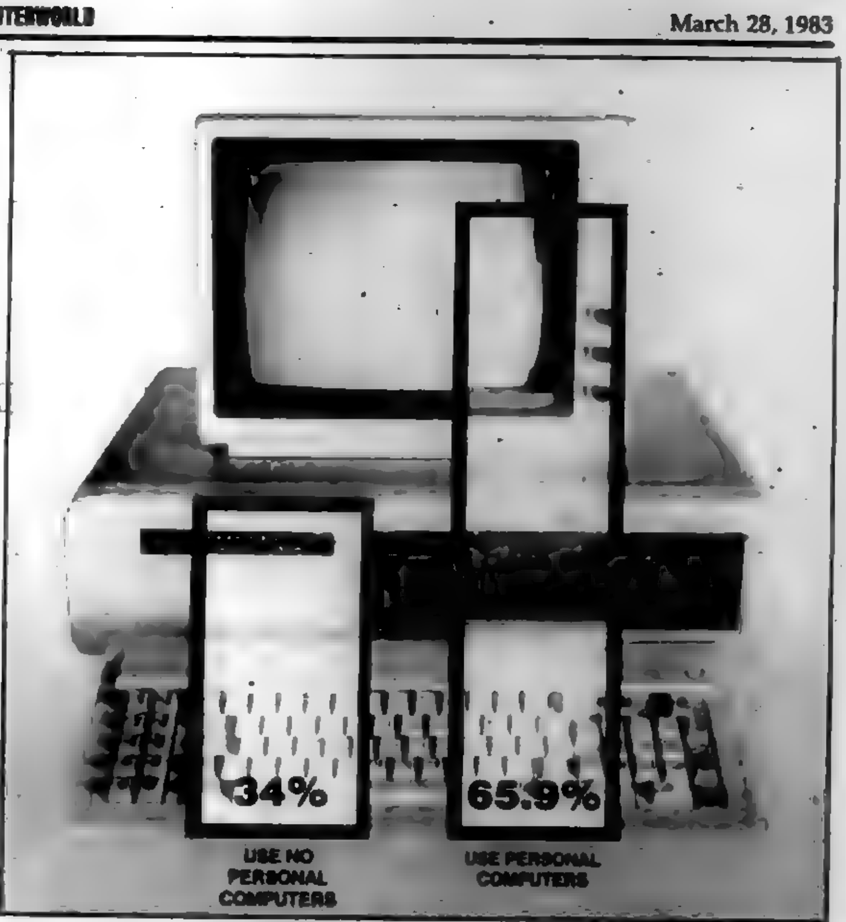
Of the same 43 managers, 12 (27.9% of 43) have had "some" data security problems and one (2.3%) has had "serious" data security problems.

But even problems do not seem to cloud these managers' visions of a bright future. Forty-two of the 59 (71%) managers currently having problems said they encourage more end users to have personal computers. Even two of the seven with serious problems encourage the use of personal computers.

Thirty-nine of the 75 (52%) managers surveyed who are not using personal computers of any kind also indicated they encourage their use. And, not surprisingly, 56 of the 88 (63.6%) with no problems at all also encourage personal computers in the work place.

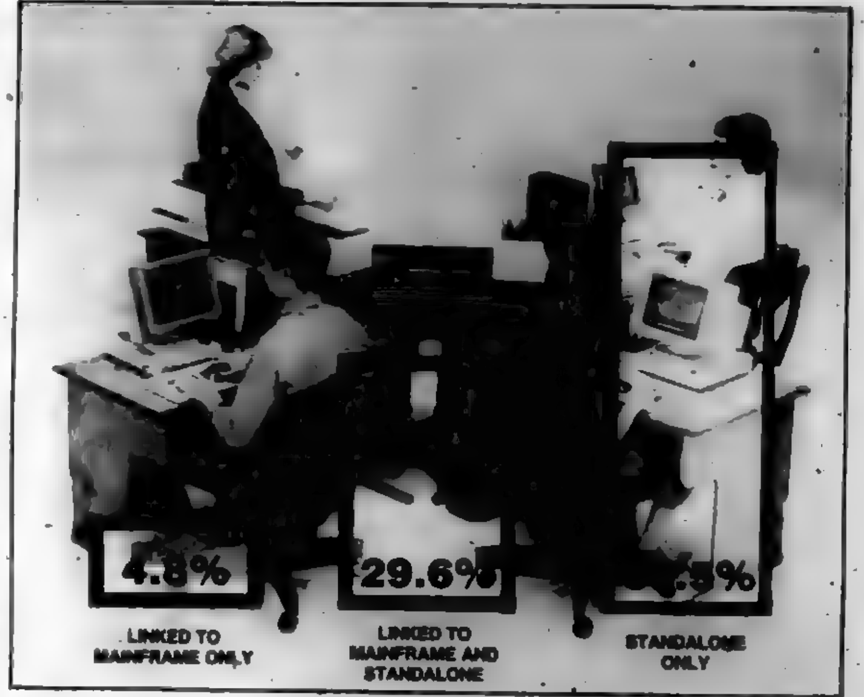
Eight of the 59 (13.5%) managers with personal computer-related problems discourage their use and eight are indifferent. Thirteen of the 75 (17.3%) nonusers discourage their use, while 15 (20%) are indifferent. Lastly, five of the 88 (5.6%) managers with essentially problem-free personal computers discourage the use of personal computers and 22 (25%) are indifferent.

These figures reflect the fact that some managers indicated they encourage some users and discourage others from using personal computers.



CW Chart

Figure 1. Of 220 respondents to a CW mail survey, 75 indicated they use no personal computers in their firms, while 145 indicated they do.



CW Chart

Figure 2. Of the 145 respondents using personal computers, seven utilize only personal computers remotely linked to a mainframe; 43 have a combination of personal computer users remotely linked to a mainframe and others stand-alone; and 95 use only stand-alone personal computers.

This User Anticipating Some Problems

One company that responded to the *Computerworld* survey, currently setting up an in-house personal computer store, will be facing other problems in June, when it links about 25 IBM Personal Computers to its mainframe to act as management workstations.

How does Mutual Benefit Life Insurance Co. in Newark, N.J., intend to avoid problems of data flow and data security? "In terms of data flow, we have developed Personal Business Computing Guidelines," explained Charles McCaig, vice-president of the Information Services Division.

The guidelines basically say that personal computers "are best used as tools for one's personal needs and for departmental systems needs," McCaig noted. Interdepartmental applications that "start to create dependencies from other departments on [a user] are inappropriate for both parties," he said. In addition, applications that have a companywide impact are disallowed by the guidelines.

The Information Services Division does not intend to "go out and check to see what [users] are doing, but we do have a certain level of control over the amount of and what kinds of data we allow them to access," McCaig said. "And that is really the control point."

In this changing environment, what will the ultimate relationship be between the end user and the management information systems (MIS) department? "The MIS department will be the consultant and adviser to the end user and will encourage the end user to make aggressive use of personal computers within a set of guidelines," McCaig said.

"All we really want to be careful of is that the company data bases and the major company processes are in fact properly controlled," he added. "I think at this point in time, and for a while anyway, that control requires a central MIS.

"We've got to take care of the backbone network computer systems and we really have to be relied on [illegible] make the right hardware selections and see that the whole thing fits together," he concluded.

Should They Restrict Their Growth?

Info Center Managers Grappling With Micros

By Lois Paul
CW Staff

Managers of information centers are grappling with the same problem facing management information systems (MIS) managers everywhere: What to do about micros?

An information center — the term was coined by IBM several years ago — is a facility within an MIS department dedicated to helping end users handle some of their own programming needs. Rather than adding his request, for example, for a one-time report to the DP department's already huge application backlog, an end user can go to the information center for training on software packages and handle a "quick and dirty" job like this himself.

Each of the three managers of fledgling information centers profiled by *Computerworld* over a year ago [CW, Dec. 28, 1981-Jan. 4, 1982] has wrestled since with the question of whether to restrict the growth of microcomputers within his corporation or provide support after the end users have purchased the micros on their own.

Osborne Micros

Karen White, for example, who is supervisor of the California State Automobile Association's (Csaa) information center, installed about 124 Osborne Computer Corp. microcomputers in Csaa's district offices four months ago to support a software package Csaa's DP staff wrote for handling insurance rate quotes. Forty additional micros have since been installed in Csaa's main office departments for more general use.

"We have been very fortunate because we have had full cooperation from our user community and, so far, we do have only one brand of microcomputer in here," White noted.

However, the Osborne is probably an interim solution. "We don't think we necessarily want to tie ourselves up with more expensive equipment at this point when there will be much more powerful equipment available for a lot less money two or three years from now," she explained.

White pointed to the micros as a major reason why her group has grown from a two-member operation to a staff of 11 that includes a core of four analysts and seven word processing and clerical support people.

> *The three managers of fledgling information centers profiled by* Computerworld *over a year ago have wrestled since with the question of whether to restrict the growth of microcomputers within their corporations or provide support after the end users have purchased the micros on their own.*

The information center itself supports nearly 1,000 people.

Carl Smith, information center manager for Gould Pumps, Inc. in Utica, N.Y., has taken a more formal route, developing a corporate policy designed to control the growth of microcomputers. "Last year we took an active role. When the IBM Personal Computer was announced, rather than sit back and wait and see, we bought one for the center," he said.

But after evaluating the Personal Computer and writing some software on it for user departments, Smith's group decided to hold off on the wholesale purchase of microcomputers. It decided, instead, to continue using end-user-oriented tools on the mainframe because more computing power and storage is available with the mainframe-oriented tools.

In addition, he said, the users have access to existing data bases, and the mainframe-oriented, fourth-generation packages seem more user-friendly than the software available on the Personal Computer.

For those reasons, Smith is hoping to prevent purchases of microcomputers among end users for at least a year, while his information center continues to evaluate machines.

Both White and Smith believe that users should not be encouraged to work in procedural languages such as Basic on their personal computers. Smith feels that much of the available microcomputer software does not meet user needs when purchased and, therefore, requires time-consuming modifications.

However, White's group had a good experience with several packages provided with the Osborne, including Micropro International Corp.'s Wordstar and Sorcim, Inc.'s Supercalc. But, she said, Ashton Tate's Dbase II has proven somewhat of a disappointment in terms of its user friendliness. "We are now in the process of looking for another layer of software as a front end for that."

The third information manager profiled last year by CW, John Kincaid, is not trying to stem the growth of microcomputers at Union Carbide Corp. Kincaid is staff analyst for the CMS Support Group in South Charleston, W. Va., which comprises the firm's information center.

(Continued on Page 16)

More Pressure For CPU Power Affects Centers

More than a year after their start-up, the three information centers profiled by *Computerworld* in 1981 have been affected one way or another by resource utilization pressures.

At Union Carbide Corp., the need for more horsepower to support the information center's approximately 2,100 users led to an upgrade from an IBM 3033 to a 3081. The company, which is running the VM/CMS High Performance Option operating system, will go to the K upgrade of the 3081 next month.

"What we have found is that each increment of processing power that we have added has been consumed almost immediately," said John Kincaid, staff analyst of the CMS support group.

Limited computer resources have restricted the growth of Gould Pumps, Inc.'s information center, which anticipates the installation of an IBM 3083 next month. The existing IBM 4341 Model Group 2 is out of resources, according to information center manager Carl Smith.

Although the California State Automobile Association (Csaa) has not had to upgrade its computer system because of information center demands, concerns about the CPU capacity required for IBM's APL-based ADRS II have led to the placement of restrictions on growth in the use of that product. "This is one of the things that drove us in the direction of microcomputers," information center supervisor Karen White observed.

Although no "run-ins" with production DP staffers were reported by the three information center managers, the issue of CPU resource is a sensitive one. Smith feels that the question of which type of DP job should take precedence must be left to the end users. White, however, said that assuring DP that she is analyzing the risks as well as the benefits of installing a new package seems to appease most of its concerns.

Variety of End-User Products Offered by Firms With Info Centers

Each of the three organizations that have implemented the information center concept is offering a different variety of end-user-oriented products.

At California State Automobile Association (Csaa), they include IBM's Document Composition Facility, APL-based ADRS II and Project Evaluation and Control System on the mainframe and Sorcim, Inc.'s Supercalc, Micropro International Corp.'s Wordstar and Digital Research, Inc.'s CP/M operating system and CP/M utilities on Osborne Computer Corp. microcomputers.

"We are still missing a fundamental tool," said Karen White, supervisor of the Csaa information center, referring to software that will allow information center users to access mainframe data. She indicated that this type of software should be brought on board by next year.

Gould Pumps, Inc. of Utica, N.Y., is offering its users Pansophic Systems, Inc.'s Easytrieve, On-Line Systems, Inc.'s Foresight financial planning system and IBM's Graphic Data Display Manager (GDDM). Information center manager Carl Smith plans to install Information Builders, Inc.'s Focus toward the end of this year.

In addition, White has installed a Fortran compiler to enable the firm's engineers to switch from using a time-sharing system to working on the host. In line with the installation of GDDM, Smith's group has set up a walk-in graphics center for users which includes color terminals and printers.

His group also has taken on responsibility for promoting office automation systems within the firm. Currently, it is installing a distributed word processing system in the corporate offices.

At Union Carbide Corp., information center users can choose from Infodata, Inc.'s Inquire, Issco Graphics' Tell-A-Graf, SAS Institute, Inc.'s SAS, Execucom Systems Corp.'s Interactive Financial Planning System and the traditional programming languages. Each is handled by a product coordinator who fields enhancement requests and handles training.

There also are internal packages for areas such as physical chemistry, engineering, mathematical analysis and management science.

The information center no longer is using IBM's Query by Example because it was too expensive in terms of resources, explained John Kincaid, staff analyst for the CMS Group.

Backlog Decline Not Credited To Info Center

Although the information center concept was developed in hopes of reducing the management information systems application backlog, none of the three information center managers interviewed recently could directly attribute decreases in application backlog to the development of his information center. But each was able to point to indicators that spell success for the concept.

The California State Automobile Association's information center "has had a good track record," said Karen White, information center supervisor. "People are aware of successes that our group has helped with in other departments, so they do come to us."

At Gould Pumps, Inc. of Utica, N.Y., the number of smaller requests submitted to the DP department — projects requiring eight hours or less — has fallen off completely. "That shows you that much of the maintenance and quick one-type deal ad hoc requests are now being accomplished with information center tools," said Carl Smith, information center manager for Gould Pumps.

And at Union Carbide Corp., one of the company's divisions has developed its own decision support system to provide its upper management with sales and forecasting data. "In the past, that type of work would have been funneled through the central processing groups and probably increased their backlog," according to John Kincaid, staff analyst for the CMS Support Group.

Dodge Assails Current State of Software

By Bob Johnson
CW New York Bureau

NEW YORK — Although comprehensive, "feature-rich" applications software packages are available today, most pay only lip service to integration, are not really data base-oriented and are not as user-friendly as they could be.

That is how Frank H. Dodge, president of McCormack & Dodge Corp., described the state of the software industry earlier this month. Dodge's firm, the vendor of financial and accounting software packages, was acquired for $50 million last week by Dun & Bradstreet Corp. (story on Page 101).

Speaking on future software industry trends in his keynote address at the Software/Expo East conference here, Dodge said some vendors are providing applications packages that work reasonably well, but most software products are neither doing all the things for which users bought them nor functioning as vendors originally designed them. This has created a "product utilization gap" which "we as an industry must begin to put our resources into bridging.

"Today, there are more first-time users than ever before. The backlog of applications software is still growing, and with all the market hype and competition, users, despite their sophistication, are becoming more and more confused by the myriad of hardware and software product combinations on the market."

Dodge expressed confidence that the software industry has the financial and human resources available to meet the challenge this "gap" has created. One way for vendors to do it, Dodge said, is to find a new approach to systems development. Major software vendors must "divorce themselves from the short-term current focus of adding more features to meet competition and must not yield to user base enhancement pressures. We know that system changes and upgrades done in this kind of context only aggravate and reinforce the problems of utilization and product complexity."

Instead, Dodge called for long-term development and a "pure" approach to research. Software firms that expect to be successful must be willing to make substantial investments in software research at the potential cost of lower profit margins.

"The current system development environment must have this sort of pure research approach because of the accelerated breakthroughs that are occurring in hardware costs and system software technology," he explained. "The old constraints of program size, storage size, on-line and data base limited capabilities are gone."

Trainer Offers Free WP Courses To Unemployed

BURLINGTON, Mass. — In an attempt to "try to turn around the unemployment situation" with philanthrophy, Victor Yuan, president of United Word Processing, Inc., is training word processor operators at no charge.

Possibly the first program of its kind, the 35-hour course has been offered to Comprehensive Employment and Training Act (Ceta)-eligible people since January. "This is the first offer of direct training from a private fund that I'm aware of," said Martin Robb of the Massachusetts Department of Manpower Development, who helped Yuan develop the program.

To gain acceptance to the free course — priced for Yuan's paying students at $300 — people must demonstrate economic hardship and an ability to type at least 40 word/min.

"We want to help people who need help the most," Yuan commented. "Ceta does the initial screening, then we do the free training."

"Of course we're taking a big loss on this. It's taking a big chunk of our time," Yuan admitted. "We're just a small school making a small ripple. But perhaps we can rock the boat and be an inspiration to bigger companies like IBM and Wang to train unemployed people for free."

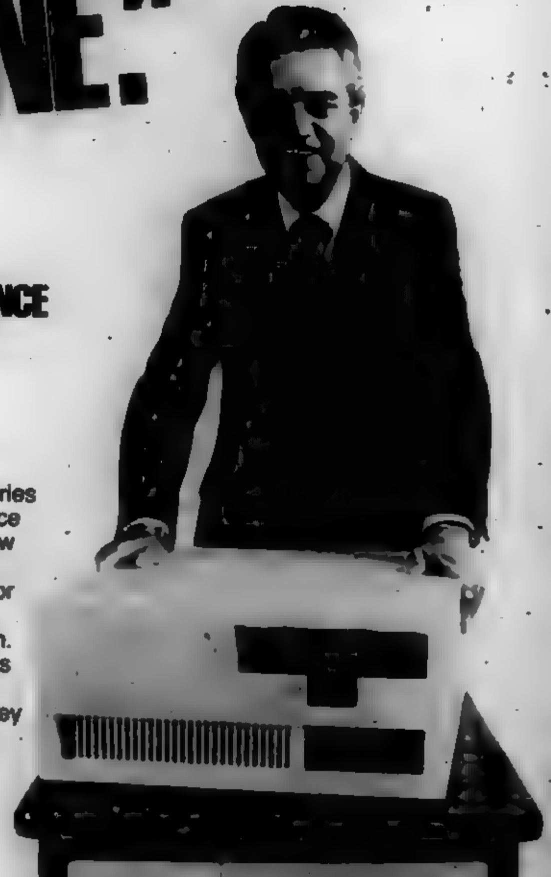
Managers Deal With Micros

(Continued from Page 15)

A number of Union Carbide employees have bought micros. The information center is not trying to control their acquisitions; instead, Kincaid said, it regards them as "just another tool that can be used."

Nevertheless, one of the information center's future considerations will be those micros' effect on its operations. "We can't stop them and we don't want to stop them, but we do want to be able to provide [users with] support after they have got their personal computer and they find out it is not going to suit their needs completely. We want to make it as easy as possible for them to link into the data center," Kincaid said.

All three information center managers are seeking general-purpose packages allowing communications and transfers of files between microcomputers and mainframes.



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Minis, Printers, Terminals

N.J. Spending $22,000/Mo for Boxed DP Gear

By Susan Blakeney
CW Staff

TRENTON, N.J. — Stacks of Honeywell, Inc. minicomputers and an assortment of Honeywell printers and terminals — waiting patiently in their boxes for a year and a half — are costing the New Jersey Division of Motor Vehicles (DMV) here $22,000 in leasing fees each month.

DMV cannot set up the equipment because it has yet to secure appropriate office space for the hardware, according to DMV Public Information Officer Art Smith. While 22 of the state's 50 DMV branches are up and running with their new Honeywell equipment, space for the remaining 28 sites has yet to be rented.

Those 28 offices are still using manual systems for such tasks as license and registration renewals, while their computers sit, still boxed, in the basement of the state's Systems and Communications Building in West Trenton.

The present Republican administration under Gov. Thomas Kean inherited the situation from former Gov. Brendan Byrne's administration, which allegedly leased the computer equipment before establishing where it would go. Most of DMV's offices were unsuitable for the Model 43 Level 6 minicomputers because of space and power constraints, so the offices had to move or be extensively renovated, Smith said.

Furthermore, the new DMV offices need to be in buildings carrying at least five-year leases because of the renovations required. "It wouldn't make sense to renovate a building for anything less than a five-year lease," Smith pointed out.

Arrange Leasing Terms

Before DMV can rent new office space, however, the state's Bureau of Real Estate must be consulted to help arrange leasing terms with the property owner or landlord.

The next step is to bring the agreement before the state budget director for his approval.

From there, the proposed lease goes to the state treasurer's office, then to the president of the state Senate. The lease is then subject to the approval of New Jersey's Speaker of the General Assembly, Alan Karcher (D-Middlesex).

If it wins Karcher's approval, the state goes back to the owner to negotiate renovations such as special electrical, parking and handicap ramp requirements.

"Even once the lease is approved, it's another three or four months of renovations. Some of these leases will probably be no good when they finally go through . . . the landlords are sick of waiting around for us," Smith remarked. For example, one lease that awaits Karcher's approval dates back to November 1981, according to Smith.

Karcher countered by accusing DMV of being politically motivated and wanting to rent office space from their political friends. In a recent telephone interview, he argued that DMV's existing office space is adequate and "they [DMV] don't have to move all those offices. As far as I know, it's just terminals that need to be installed — how much space do they take up?"

Karcher also maintained that the proposed leases are too expensive. "They could find space that's 50% to 100% cheaper than what they took. And many of these places are in the most remote locations. It doesn't make sense!"

Asked about the ultimate costliness of all this finger-pointing — some $400,00 over the past 18 months — Karcher maintained his position: "I would hope that they [DMV] would find better leases, and I know they can. I'm not going to sign any leases for these prices — $18 and $19 a square foot — when I know there's $6, $7 and $8 office space available."

As for DMV's contention that it must secure a minimum five-year lease, Karcher said, "There's no need for a five-year mimimum. They just want to carry these things over to the next administration."

Data Courier to Offer Publications Directory

LOUISVILLE, Ky. — Data Courier, Inc. has announced plans to publish a directory of serial publications serving the computer and software industries.

Called "Select: A Guide to Computer and Software :Publications," the directory will be published for information specialists and others that are interested in industry publications.

The directory will describe more than 500 publications, listing general content, cost, publisher and address, average number of pages, audience and advertisers, according to Data Courier.

The directory will be available in September and costs $50.

After September, the directory will cost $65.

Data Courier is located at 260 S. Fifth St., Louisville, Ky. 40202.

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Group Keeps Users From Feeling Left in Lurch

By Susan Blakeney
CW Staff

NATICK, Mass. — Cherryl Foster maintains that when Informatics General Corp. comes out with a new software offering, it urges users to "start with the book, then use your imagination" to make the most of the product. That, she thinks, makes users feel that they have been left in the lurch.

But meetings of the Mark IV Users of New England (Mune) users group serve to tap and organize the collective "imagination" of the users, which enables them to use the Mark IV software language better.

"Other people's techniques can be really helpful," said the programmer from Automation Industries, Inc. in Bath, Maine. "I come to all the users group meetings."

Foster has been a Mark IV user and a users group member for about two years. Claiming that the users group has been largely responsible for most of the improvements Informatics has made to Mark IV, she would like to see the users group incorporate other Informatics software products that she uses into its scope, Foster said.

"It should not be just tailored to Mark IV, although I realize you have to be careful ... you can't become too diversified. But I'd like to see Answer/DB [Informaties' online inquiry package] included at the meetings. Unfortunately, there's only a few users around here right now."

Mune, one of approximately 10 regional Mark IV users groups, convenes three times a year. It operates independently of the vendor, although there is usually an Informatics representative on hand at each meeting for an "Informatics Update" session.

In addition to the regional users groups, Mark IV users are also invited to attend semiannual IV (pronounced Ivy) League, Inc. national Mark IV users group meetings. The next one is slated for New Orleans, May 1-4.

There are no membership dues for any Mark IV users group member, just registration fees for the various meetings. To keep costs down, all speakers come from within the users group and address the group for free, said Ron Connors, Mune's current secretary/treasurer. Connors, a Mark IV user at State Mutual Life Assurance in Worcester, Mass., noted that the present Mune administration is

Cheryl Foster

Ron Connors

CW Photos by S. Blakeney

Beverly Bishop

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by New Offerings

working on setting up an "exchange program" with speakers from other regional Mark IV users groups, such as the Eastern Regional Mark IV Users Forum (Earmuf).

Like Foster, Beverly Bishop, a four-year veteran of Mune, finds the users group meetings very helpful and "brings something back from each one." In addition to the workshops offered at the meetings, Bishop, a research consultant with Prudential Insurance Co. of America in Boston, finds the contacts she has made through Mune very useful.

"We can't go to our systems people for help because we have a better understanding of Mark IV than they do. We both operate in a vacuum, so we need to come to these meetings," she said.

Burgeoning Micro Sales Predicted

NATICK, Mass. — Luther Weeks believes "price drops and total sales of microcomputers will exceed all current estimates."

Weeks, assistant director of data processing, with emphasis on microcomputer support, at Travelers Insurance Co. of Hartford, Conn., made this statement during a speech entitled "Microcomputers and Their Applications" at a Mark IV Users of New England meeting held here last week.

Weeks also anticipates faster machines; more standardization of workstations and operating system software; and greater availability of integrated multifunction software packages like Visicorp's Visicalc.

"Spreadsheets have probably done more to sell micros than any other single capability," Weeks said.

Weeks offered his audience the following advice on selecting and acquiring microcomputers:

- Decide what you want the personal computer to do before you get one.
- Find software to match your major application.
- Try to find a popular, expandable machine.
- Make sure all the equipment works together.
- Test, test, and test it again.
- Understand that whatever you buy, it will become better and cheaper next year.

CW Photo by S. [illegible]

Luther Weeks

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Martin on Info Center: Take a Broad View

By Lois Paul
CW Staff

CAMBRIDGE, Mass. — "Don't take too narrow a view of the information center," James Martin warned attendees at his recent Spring 1983 Executive Seminar.

Describing the information center as "one of the most important trends" in data processing, Martin said most of the firms that have established them to aid end-user computing have generally found them appropriate for information systems rather than for production systems. "I think it [the information center] should apply to the whole of computing," he said.

Martin stressed the importance of users and information center analysts working together to build applications, sometimes with the help of programmers assigned to the facility.

"The view of the information center ought to be as broad as this. All of those things are possible," Martin said.

According to Martin, the organizations that take this broader view of the information center can realize decreases in the applications backlog.

Invisible Backlog

He noted that a problem with measuring decreases in this backlog is that "once you let end users rip" with applications building, they will reveal the "invisible backlog. But the effectiveness of computing goes up substantially."

The job of the information center's end-user product specialist is to tune the applications the end users have built, using fourth-generation languages for better machine efficiency, he continued. For example, this more experienced programmer would avoid multiple searches in a program where they are not strictly needed, Martin said.

"There are many spectacular ones, some that are failures and some that are not worth talking about," Martin said of the existing information centers. The ones that are "not worth talking about" are trying to solve trivial problems rather than addressing the real problems within the organization's DP installation. "It is very important to put together that set of people and management that will expand and grow and be successful," Martin said.

Martin pointed to resistance and fear of replacement by the DP staff as being among the reasons real end-user computing is not happening in many information centers. Centers in which end users are allowed to build their own applications "not only work, they are sensational."

UCC Meet Set for June

DALLAS — University Computing Co. (UCC) will sponsor its seventh annual Systems Software Conference in San Antonio, Texas, June 26-29.

More than 600 clients of the firm are expected to attend the four-day meeting, which will be held at San Antonio's convention center.

Further information can be obtained from UCC at UCC Tower, Exchange Park, Dallas, Texas 75235.

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Martin Sees DP Languages in 'Chaos' Period

By Lois Paul
CW Staff

CAMBRIDGE, Mass. — After nearly 20 years in which computer languages changed very little, data processing has been plunged into a period of "chaos" with languages that do not even resemble one another.

The next five years will be characterized by all manner of new products and a lack of standards, James Martin said at his Spring 1983 Executive Conference, held here earlier this month.

A problem he perceives with the influx of new fourth-generation languages is that a person building applications in National CSS, Inc.'s Nomad, for example, may still be using Cobol constructs and thinking. Referring to this as "Nobol," Martin said it is not very effective.

A DP installation's applications development group should include a number of new graduates who can be trained on the new languages, plus older experienced programmers whose job it will be to check for mistakes.

"You must match the application to the language," Martin stressed, noting that there are catastrophe stories about firms that did not do this. "You must have somebody with enough technical knowledge to know not to approach that particular application with [Mathematica Product Group, Inc.'s] Ramis, for example."

He suggested that one person on the staff be assigned as the fourth-generation language "expert." This person will be expected to learn about various languages and then build applications with them so he can compare their capabilities. He will also look at crucial areas such as machine performance.

'Flying Blind'

"Until you get that expertise, you are flying blind trying to do big projects with fourth-generation languages," Martin said.

The introduction of fourth-generation languages to a firm must be part of a specific plan in which the manager says, "You will use [Information Builders, Inc.'s] Focus and you will use it for this particular process," and so forth, he said.

"That is the sort of management that is making these things happen," Martin said.

"Programming in fourth-generation languages has brought an excitement back to DP that had been driven out by the bureaucracy of the 1970s," Martin said, referring to this as a "challenge to be creative.

"When people are excited, they work very hard." One of the challenges, therefore, is "to remove the levels of control and bureaucracy that were acceptable in the Cobol environment but now need to be thrown overboard."

HISSG Meet Set for May

DALLAS — "Financial Information Systems: Current Status and Future Requirements" will be the theme of the Hospital Information Systems Sharing Group's (HISSG) third annual seminar here May 18-20.

Walter J. Unger, associate director of the Washington, D.C., office of the Healthcare Financial-Management Association, will be the keynote speaker. Unger will speak on "The New Era of Case Mix Reimbursement: Its Effect on Healthcare Financial Information Systems."

Other speakers include Dale L. Thomas, president of American Health Management and Consulting Corp., "Alternative Delivery Systems"; John Eresian, vice-president of finance at Northwestern Memorial Hospital, "Financial Management and Modeling"; and Cynthia Barnard, director of DP product and research at Northwestern Memorial Hospital, "The Tax Equity Financial Responsibility Act, Diagnostic Related Groups and Beyond."

The registration fee for the seminar is $100 for HISSG members and $190 for others. HISSG is located at 11800 Sunrise Valley Drive, Reston, Va. 22091.

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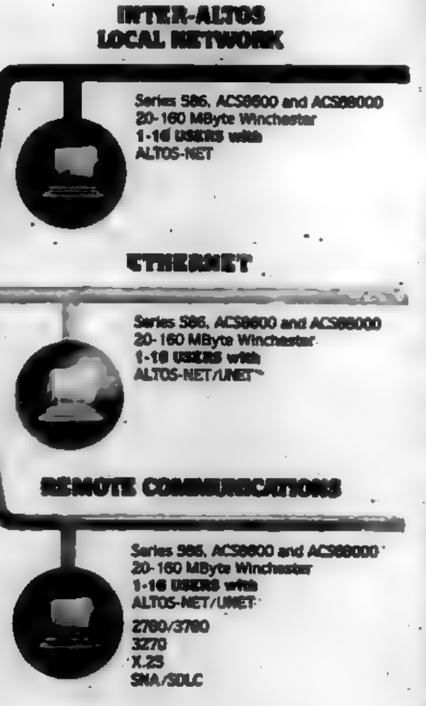

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Micros, Distributed DSS Meet Set

BOSTON — A conference on "Personal Computers and Distributed Decision Support: A Managerial Perspective" will be held May 12-13 at the Back Bay Hilton here.

Sponsored in cooperation with the local chapters of several professional societies, including the North American Society for Corporate Planning and the Planning Executives Institute, the conference will cover the influence of new developments in the areas of microprocessor technology, telecommunications and software design on the evaluation and selection of decision support products.

The conference is intended to focus on key issues involved in the implementation of distributed decision support systems (DSS) with personal computers, including user needs assessment, networking, hardware capabilities and limitations, software capabilities, current directions in DSS hardware and software development and the legal issues associated with networking and distributed applications.

Keynote speakers will be Peter G.W. Keen of Micro Mainframe, Inc.; C. Lawrence Meador of MIT and Research & Planning, Inc.; and Jeffrey A. Meldman and Michael S. Scott Morton, both of MIT. In addition, the presidents of 10 software firms will describe their products.

Registration for the conference is $495. Further information can be obtained by contacting DSS Conference, 215 First St., Cambridge, Mass. 02142.

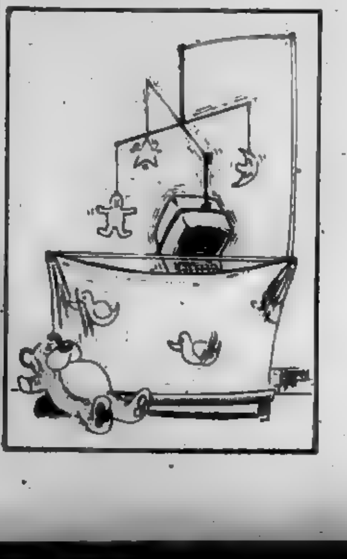
ABA Session Set for Miami May 22-25

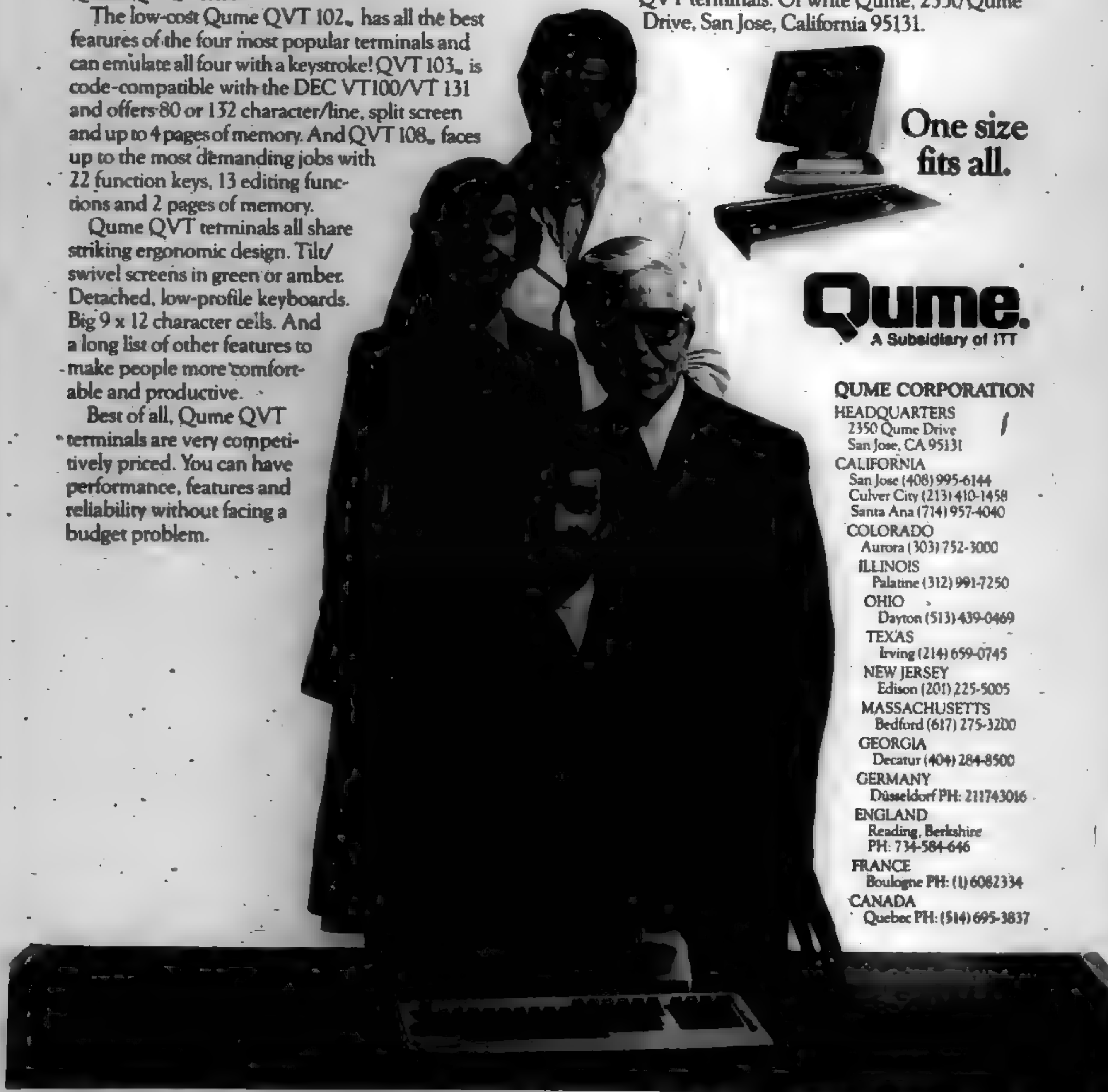
MIAMI — The 1983 National Operations and Automation Conference, sponsored by the American Bankers Association (ABA), is scheduled to take place here May 22-25.

Focusing on effective use and management of technology, the conference will examine home banking, automated-teller machines, telecommunications, check safekeeping, check processing, microcomputers, electronic funds tranfer and smart cards, according to show sponsors.

An exhibit floor with over 400 booths will showcase a wide range of products and services, including automated information retrieval systems, check-sorting and processing equipment, microcomputers and bank application software.

Registration for the event is $475 for ABA members and $625 for others. Further details are available from ABA at 1120 Connecticut Ave. N.W., Washington, D.C. 20036.





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'Electronic Ball and Chain' Sparks Controversy

By Katherine Hafner
CW Staff

ALBUQUERQUE, N.M. — Some are calling it an innovative approach to an age-old problem. Others are calling it one step closer to George Orwell's frightening scenario for the future.

As part of an attempt to reduce crowding in county jails, an "electronic ball and chain" will be worn by misdemeanor offenders who have volunteered to participate in a 90-day pilot program here. They will serve their sentences at home while wearing electronic bracelets that monitor their every movement.

Instead of reporting to jail after work every day, work-release prisoners and probationers will wear a device 24 hours a day that emits a digital code that is transmitted to a device connected to the wearer's telephone.

The bracelets, which were expected to be ready for use last week, are monitored by a Zilog, Inc. Z80 microprocessor with an autodial modem attached to the wearer's telephone, which ties into Bernalillo County's Honeywell, Inc. DPS 5/20 mainframe. If the wearer wanders more than 200 to 300 feet from the telephone, the telephone automatically signals the computer via a Honeywell Datanet 6670 front-end processor.

The computer is alerted to the exact time the wearer leaves for work and when he or she returns. If the bracelet is tampered with in the slightest way, a signal is sent to the computer.

"The advantage is that without having to send a probation officer to someone's work place or home, we can impose a curfew and make sure it's followed," commented District Court Judge Jack Love, who will impose the bracelet sentences and plans to wear the bracelet himself for a few days to test its reliability.

People will wear the bracelets in three shifts of 10 at a time and pay $70/mo for six months, which Love said is equivalent to the fine that most would pay.

But Norma Rollins, director of the American Civil Liberties Union's (ACLU) privacy project, sees the experiment in a different light.

"Anything that requires someone to be under surveillance 24 hours a day raises terrible privacy questions, not only for the individual but for the rest of society," Rollins said. "I won't deny that it's efficient, but it's like putting a leash on. We put leashes on dogs, not people."

Though a convicted criminal's constitutional right to privacy is limited, critics feel that the concept of 24-hour electronic surveillance has "frightening" implications.

The bracelet project may be the first of its kind to be instituted within the criminal justice system. Its critics are not only concerned with the question of privacy, but they fear that such electronic monitoring systems may eventually be used beyond their originally intended limits.

Steve Winter, an attorney for the National Association for the Advancement of Colored People's Legal Defense Fund said, "When you introduce alternatives, they end up being used not only for people who were sent to prison, but others who would not otherwise go to prison."

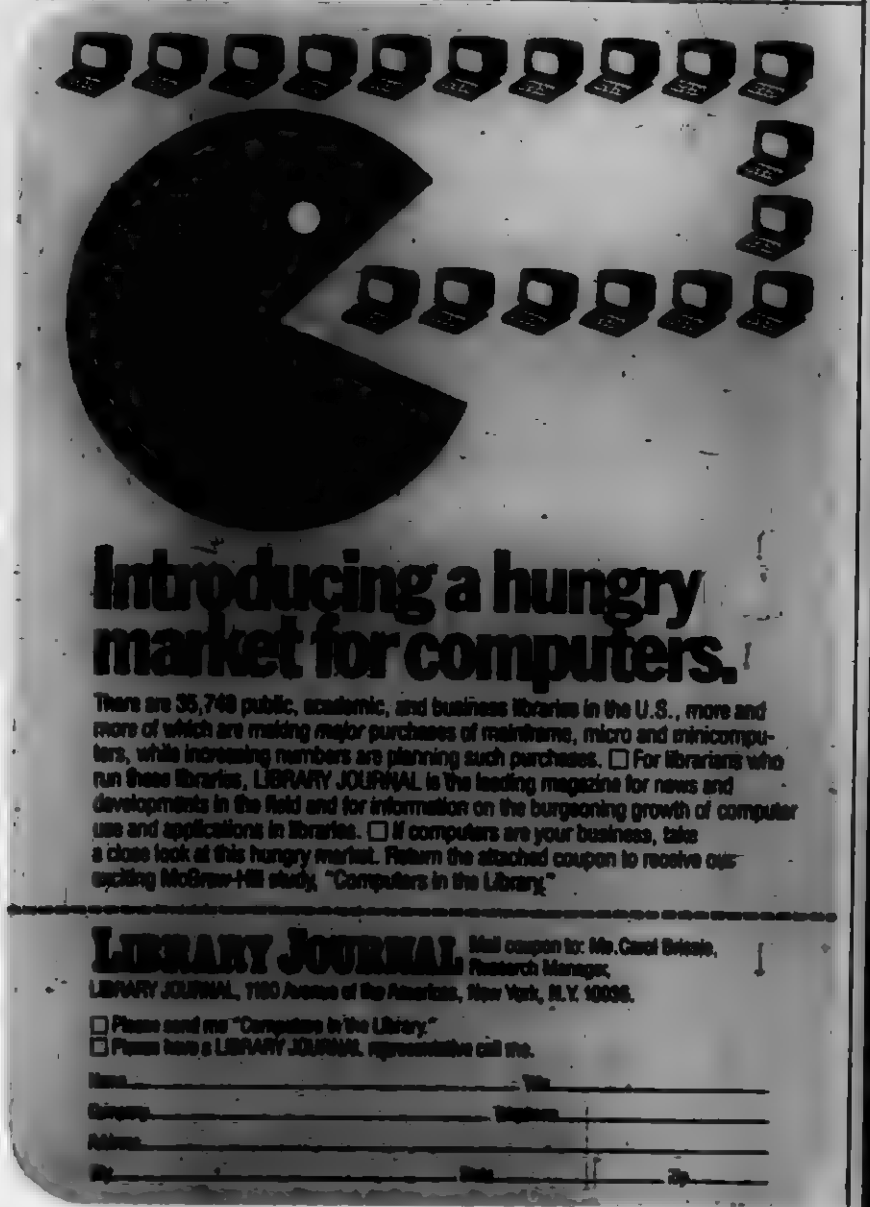
"If you walk into court for a traffic ticket, you might walk out wearing a bracelet," said Steve Ney of the ACLU's prison project.

Michael T. Goss, president of National Incarceration Monitor and Control Services, Inc., the Albuquerque-based company developing the device, defended the project.

"It does not report what a person is doing, only whether they are in a specific location or not," he said. "If anyone feels it's too harsh, they can violate their probation and go to jail instead," he said.

"If someone is giving them a choice, it's a coercive kind of choice because their alternative is to go to jail," said the ACLU's Rollins. "Work release has always been given to people who can be trusted to leave jail during the day. I don't think someone who has been released needs this kind of second-to-second surveillance."

Whether technology is being exploited beyond acceptable parameters or if the bracelets prove the answer to the nation's overcrowded jails is yet to be determined.



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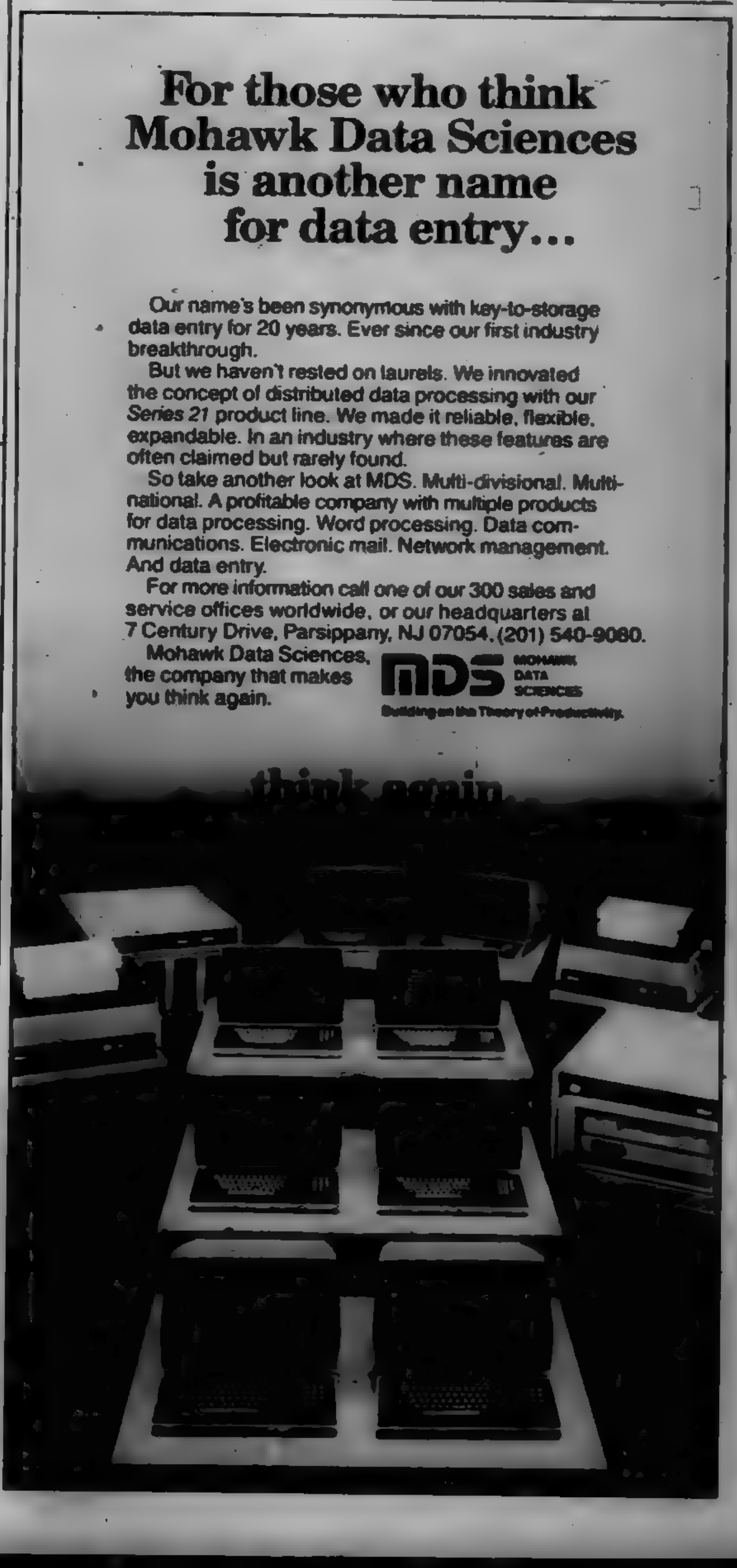

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Another Great Impostor?

Career of DP 'Prof' Abends From False IDs

By Paul Gillin
CW Staff

LANCASTER, Pa. — In a multiple-identity case that grows more bizarre by the day, police here last week arrested a man who allegedly taught a full-time course load at two state colleges nearly 60 miles apart while operating under a different identity at each institution.

The man, whose identity has not been determined, allegedly taught two undergraduate and two graduate computer science courses at Shippensburg State College, located 45 miles southwest of Harrisburg while simultaneously teaching four courses in business and finance at Millersville State College in a suburb of Lancaster.

The man was arrested last Monday as he entered a classroom building on the Millersville campus. A subsequent search of his Lancaster apartment turned up 16 boxes of material related to at least 13 separate identitities, according to Robert Gentzel, a spokesman for Attorney General LeRoy Zimmerman.

Gentzel said some of the material "related to other universities in the Northeast."

Also found in the apartment was a home computer with a modem and numbers that are believed to be access codes to the computers on the Shippensburg and Millersville campuses.

As far as the man's identity is concerned, "We haven't the damnedest idea," Gentzel said. "This case gets more confusing by the day."

Officials said the man, who was described as being in his 50s, taught at Millersville under the name of Dr. Peter H. Pearse while maintaining his post at Shippensburg under the name of Dr. John Byron Hext. The man taught three morning classes and one evening class at Millersburg, maintained regular office hours and was active in interdepartmental affairs.

Never Missed Class

"As far as I know, he never missed a class," said Dr. Keith Lovin, provost of Millersville State College.

Lovin said performance evaluations performed early this year showed the man's teaching performance had been generally satisfactory. "Some problems surfaced, but they were not centered around his mastery of the material," Lovin said.

A spokesman for Shippensburg State College would not comment on the man's competence as a teacher, but said he had taught two sections of an undergraduate computer course and two graduate courses in hardware/software systems.

"An independent commission has been formed to spend 30 days screening course materials and notes and interviewing students to prescribe action," said spokesman Ray Burd. "Our first concern is the students."

The bizarre dual identity came to light early this year, when officials at both colleges began to doubt the background of their new faculty member. Lovin said that "Dr. Pearse" had presented himself for a position at Millersville college claiming that he held a Ph.D. from the University of Edinburgh in Scotland.

"He provided letters of recommendation from a Monroe & Co. with a Washington, D.C., address and from a Regent Co. in Baltimore," Lovin said. "At the time, we took the letters to be legitimate." Lovin said the college's dean subsequently contacted one of the references and got a strong recommendation for Dr. Pearse.

Lovin said the man also provided adequate proof that Dr. Pearse had received a doctorate from the University of Edinburgh. "It was only [after the arrest] that I learned that there is indeed a real Dr. Pearse who is employed at the University of British Columbia."

He added that the same scenario occurred at Shippensburg, where it was found that the real John Hext was teaching in Australia.

Burd said the man was suspended without pay from his teaching post at Shippensburg Feb. 17 after an investigation turned up discrepancies in his credentials. The man was dismissed from the faculty March 10.

Gentzel said the fraud was exposed when a Shippensburg campus police officer, acting on a hunch, showed a photo of the suspect to members of the Millersville campus security force. "When the security people started showing the photo around, people recognized him," Gentzel said.

The man is charged with theft by deception, tampering with public records, forgery and false swearing. The first three charges are felonies and carry a maximum penalty of up to seven years in prison and up to $15,000 in fines. The fourth charge provides a maximum penalty of up to two years in jail.

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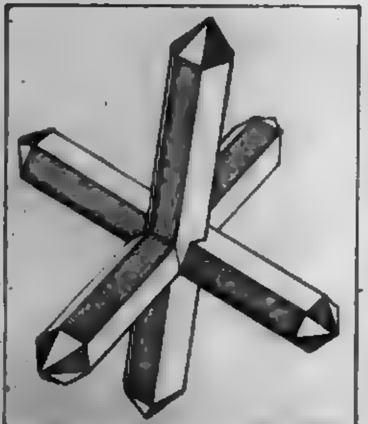

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Exec Airs Aetna's Plan for More Tech Activity

By Marguerite Zientara
CW Staff

NEW ORLEANS — "We are going beyond the support of products to make technology a major part of our products," stated Irwin Sitkin of Aetna Life & Casualty Insurance Co.

The vice-president of corporate administration made his comments in a presentation for the Life Office Management Association (Loma) conference here recently on the topic of "The Role of Information Processing: The Corporate Management Perspective."

Aetna is moving rapidly into a new phase of technological activity after a period of relative inactivity. The four areas of new technology at Aetna are office automation, videoconferencing, distributed data processing (DDP) and satellite-based communications.

Key Objectives

Aetna's key objectives in its thrust are to improve services; to speed up processing; to give agents direct access to information systems; to improve the decision-making process; and to improve the productivity of clerical, technical and managerial workers "while enforcing privacy and security controls," he noted.

The keys to success in such an undertaking "lie not in the tools themselves, but in how people interact with those tools," Sitkin said. "Objectives and plans must be articulated early on and management must deal with the question of *how* to reach business objectives through the technology."

With more than 750,000 transactions a day, "we couldn't do it without the technology," he noted. "Until recently, however, our DP systems were remote, not timely, not flexible or user friendly and could not effectively be used as input to the decision-making process."

The technology must support the payment of $25 million in claims daily to hospitals, doctors and insureds. Today there is a network of 4,300 terminals linked to a data base in the home office in Hartford, Conn. Claim payments made by the company number 45 million a year, or 175,000 a day, Sitkin noted. Each claim goes through five or six CRT terminals to be processed, he explained.

Calculated Process

Aetna's office automation efforts are coordinated with the overall corporate information strategy in a "calculated process of using the available technology throughout the organization to make the next wave of managerial and administrative users comfortable with the technology," Sitkin said.

Videoconferencing has become a "part of our daily activities," he added. With two video conference rooms in Hartford, Conn., and two in nearby Windsor, Conn., they are in use 80% of office hours. In 1982, there were more than 2,000 video meetings. This year will see one more room in Hartford and one in Chicago.

Aetna's DDP efforts are embodied in its Gemini communications network, linking agents to their branch offices in San Francisco and Washington, D.C., which in turn are connected to the home office.

Increased Sales

DDP allows agents to spend more time analyzing and processing cases, projecting and doing such things as financial analysis, resulting in increased sales volume and revenues, Sitkin noted.

A personal-computer-based time-sharing network comprises 2,410 terminals and 4,996 user identifications with the result that one out of three employees has access to the Hartford data base.

Satellite communications "will impact office automation, distributed data processing and videoconferencing," Sitkin noted. The medium "makes it easier and cheaper to reach out using electronic mail or video technology," Sitkin said. Aetna is a partner, along with IBM and Communications Satellite Corp. (Comsat) in the Satellite Business Systems enterprise.

Constraints to the success of Aetna's technological steps forward include the shortage of experienced information processing personnel, the speed of technological change, the need to maintain the "tremendous amount of existing code," hardware and software compatibilities, shorter product life cycles and continuing demands for faster service, Sitkin noted.

CW Photo by M. Zientara

'Objectives and plans must be articulated early on and management must deal with the question of how to reach business objectives through the technology,' Irwin Sitkin said.

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By Marguerite Zientara
CW Staff

NEW ORLEANS — To increase productivity, a DP manager must define meaningful work, match his employees' growth needs with job tasks and increase feedback to workers.

That was the advice of Robert Zawacki, professor of management and organization at the University of Colorado, who spoke at the Life Office Management Association (Loma) conference held here recently.

"Human change is slow and evolutionary, not revolutionary," Zawacki said. "While you may want quick fixes, it takes 18 to 36 months to implement human change."

Based on extensive research done in conjunction with Prof. Dan Cougar, also of the University of Colorado, which identified and studied 24 variables within 16 DP-related jobs, Zawacki urged managers to define "motivation."

Motivation begins with a "felt need or deficiency," Zawacki said, followed by a search for alternative ways to meet that deficiency, selection of a plan of action and subsequent evaluation of the action based on one's original expectations.

Managers must remember that they cannot base their actions simply on what they perceive as meaningful work or what they perceive as rewards, Zawacki pointed out. There is often a "conflict of values" between management and employees.

"While managers in the '50s and '60s believed that happy workers are productive workers, now that adage has been reversed and we believe that productivity leads to satisfaction," he noted.

There are five dimensions in DP work that can be used to measure how rewarding a job is, Zawacki noted, stressing that "you don't need all five to have a rewarding job." The five are: task identity, which allows the worker to see his importance to the overall operation; task significance, which is how important the job is regarded by the worker and his peers; skill variety; autonomy; and feedback.

CW Photo by M. Zientara

'While you may want quick fixes, it takes 18 to 36 months to implement human change,' Robert Zawacki reminded a recent Loma audience.

The first three factors allow the worker to experience the meaningfulness of the work; autonomy allows him to be responsibile for the outcome of the work; and feedback gives him knowledge of the actual results of his work activities.

These reactions add up to what Zawacki called "critical psychological states" or a worker's attitude toward his job. If the five elements are present, the worker will have "high internal work motivation, high-quality work performance, high satisfaction with the work and low absenteeism and turnover," he said.

In discussing autonomy, Zawacki noted that "DP managers worry about giving too much away." He said that managers are "overcontrolling these bright young people." The solution is to set "realistic, challenging, achievable goals with deadlines, instead of just saying, 'Do your best,' " which is too vague.

DP managers do a "deplorable" job of giving feedback and "young people need an abnormal amount of feedback," Zawacki said. "They are not rugged individualists." They need to know how they are measuring up to a manager's expectations, he said.

Ultimately, to keep everyone happy, managers must try to match a worker's "motivating potential score [MPS]" with his "growth need strength [GNS]" — his need for personal acomplishment. Someone with a high scope task and a high growth need will have a high level of congruence between the MPS and GNS and, therefore, will be satisfied and productive.

However, a worker with, for example, a high scope task and low growth need "will balk and be unproductive, but will remain with the job to maintain his lifestyle," Zawacki noted. "If you give meaningful hunks of work to people with high GNS, you won't even have to measure their productivity; they'll work too hard for you, anyway."

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Cause Offers Volume Of Meet Proceedings

BOULDER, Colo. — Cause, a professional association for users of information systems in higher education, is offering the proceedings of its 1982 National Conference, which was held Nov. 30 to Dec. 3.

The 528-page volume contains 42 papers related to the conference theme, "The Information Resource: A Management Challange."

Copies of the proceedings cost $40 and are available from Cause, 737 29th St., Boulder, Colo. 80303.

Sell Management on New Technologies

Enhance MIS Image to Justify Costs: Consultant

By Bob Johnson
CW New York Bureau

NEW ORLEANS — Justifying DP expenditures to company senior management is a continuing problem for the management information systems (MIS) manager.

One way to tackle the problem is to enhance the company's overall view of MIS and to use new technologies as a way to sell management on DP's business benefits.

That was the message delivered by Gary S. Venner, director of John Diebold & Associates, at the Life Office Management Association 1983 (Loma) conference held here last week.

Venner told insurance industry DPers that expenditure problems are symptomatic of underlying company problems that include lack of MIS understanding among senior managers, lack of company decision making by MIS and lack of responsiveness to changes in the marketplace.

The speaker said that it is DP's responsibility to "take a leadership role" in providing information resources to the company in order to get the exposure that is necessary for it to get funding.

Because of the industry's rapid changes, particularly in the applications area, MIS is thrust into a situation in which management and users are demanding newer and more responsive systems, Venner said. However, funds needed for these projects are slow in coming because of senior management's perception that computer costs are going down.

Although hardware costs are decreasing, increasing software and personnel costs are driving overall costs up, he noted. This places MIS in a sticky situation, which the speaker said stems from "gaps of understanding" between company management and the MIS function.

CW Photo by B. Johnson

'From once having been lauded for maintaining daily processing on a reasonable basis and at a reasonable cost, you are now chastised for not being responsive enough to marketplace demands,' Gary S. Venner told attendees at the recent Loma conference.

"From once having been lauded for maintaining daily processing on a reasonable basis and at a reasonable cost, you are now chastised for not being responsive enough to marketplace demands," he told attendees.

MIS' inability to acquire funding for data base and other software tools poses a gap between marketplace changes and MIS' responsiveness, which compounds the problem, Venner said.

In an attempt to alleviate these problems, Venner offered a concept that addresses what is happening in technology, what can be gained from it and what the implications are for the MIS management function.

Venner explained that MIS executives can make their company aware that, through the use of available technology, substantial improvement is possible in many areas. He recommended making senior management aware of several facts: the improvements in high-level and middle management areas resulting from the use of new technologies; the expectation of computer-aided design and development for products; the opportunity for technology to enhance clerical workers so they will be true assistants; and the improvements in reliability and availability of information from service areas.

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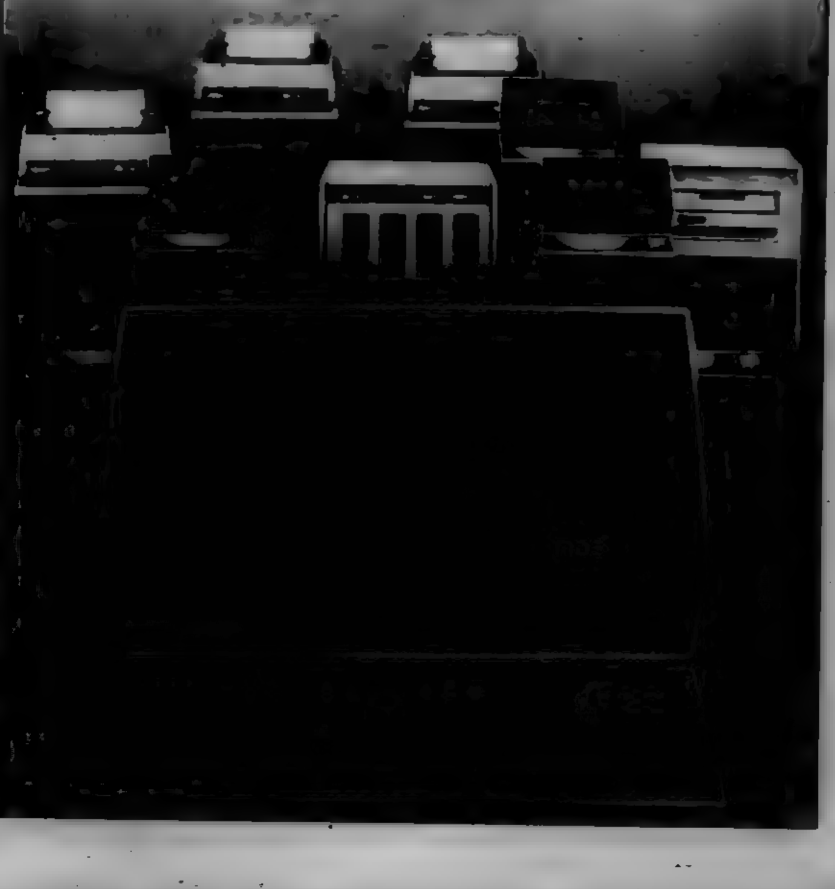

Exec Projects Growth of Easy-to-Learn Micros

By Marguerite Zientara
CW Staff

NEW ORLEANS — The future of personal computers lies in machines that are quick and easy to learn as well as "compatible with the larger issues in the corporate environment."

That is not a surprising viewpoint, coming from the executive vice-president of marketing and sales for Apple Computer, Inc., whose Lisa personal computer claims a 20-minute learning period.

Speaking on "Personal Computing — Impact on Business and Personal Future" at the Life Office Management Association conference here recently, Apple's Floyd Kvamme projected that the estimated 2.5 million personal computers now in use will grow at a monthly rate of 100,000.

Noting that currently 40% of all personal computer users are using them for business applications, whether or not the machine is in the home, Kvamme projected that five years from now most applications will still be "to support people in real-world help — not frills."

Today, "about 75%" of personal computers are being applied to three or fewer applications; about 10% are used by very small businesses to do their accounting functions; and about 20% are used for educational purposes, according to Kvamme.

When the personal computer industry started out in 1977, "virtually 100% of the buyers did their own programming, much of it in machine code," Kvamme noted. In surveys taken last July to September, however, less than 30% intended to do any programming at all.

The number of buyers who purchase a personal computer with any idea of having to learn programming is now under 10%. With an estimated 35,000 commercial programs available to them,"they don't have to," Kvamme said.

In the work place, corporations should give employees computing equipment for their use that equals 20% of their yearly salaries, Kvamme suggested. "If we can make the worker 20% more productive in a year, then the system has paid for itself."

Systems will become increasingly portable and, more and more, software will not be user-developed, Kvamme predicted. "The third-party software business will flourish," he said.

Saying he is "a little concerned" about the implications of fourth-generation languages that allow one to speak English to the machine, Kvamme pointed out that 95% of the world does not speak English. The solution? Graphics, said Kvamme.

"Training will become programming by example," he projected. "The user won't realize he's programming with graphics interfaces; these tools will be intuitive."

Kvamme likened the phenomenon to the introduction in 1949 of the hydromatic car, "which was the first time Mom felt comfortable driving," he said. Graphics interfaces will be the vehicle by which fear of computers will be overcome.

"You all work with computers, but there are lots of people out there who are scared silly about working with them," he told his audience.

CW Photo by M. Zientara

Floyd Kvamme predicted that five years from now, most personal computer applications will still be 'to support people in real-world help — not frills.'

Fifth Volume On MRP Out

PENNSAUKEN, N.J. — Auerbach Publishers, Inc. has announced the publication of the fifth volume of its Manufacturing Resource Planning (MRP) management series, "Computers in Manufacturing."

"Distribution Management" contains articles written by practitioners in the distribution profession. The volume provides the user with the understanding of how computer-based systems can effectively support distribution management. Articles focus on forecasting, order entry and processing, transportation management, finished-goods inventory management and warehouse management, according to a vendor spokesman.

Other volumes include "Manufacturing Resource Planning," "Master Production Scheduling," "Material Requirements Planning" and "Execution and Control Systems," the spokesman said.

The most recent volume costs $175. Each additional volume is $125. The complete five-volume series is $675. Additional information is available from Auerbach at 6560 N. Park Drive, Pennsauken, N.J. 08109.

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Improves Readability

Methodology Boosts Publications Group's Output

TAMPA, Fla. — Most writers would shun the idea of letting computer software tamper with their delicate prose. But a program in use at GTE Data Services (Gteds) here is helping boost output in the technical publications group while improving the readability of documentation.

The technical publications group is a 32-member staff consisting of 23 writers and a word processing staff that provide technical manuals to end users in GTE telephone companies and GTE data centers nationwide. In all, its documentation supports 32 business information systems and 80 time-shared systems.

The group published 30,000 pages of documentation last year and expects to increase that output by 10% in 1983. To achieve continued growth in output, a documentation development methodology was adopted in 1980.

Crucial Weakness

The decision to buy resulted from an analysis undertaken in 1979 which showed that standardization was a crucial weakness. "In many cases, writers were never given proper guidelines and documentation lacked sufficient details," explained Gloria James, technical publications supervisor. "In addition, much of the documentation was actually written by systems programmers and only edited by technical writers. Style and content varied widely."

The group found that few commercial documentation aids paid sufficient attention to writing or organizing written material for DP, James said. Then the search led to the Promptdoc documentation methodology from Progressive Communications, Inc. of Colorado Springs, Colo.

Promptdoc gave writers a starting point, James noted. "Promptdoc starts with the organization of the manual," she said. "It offers 25 modules, each supplying information for a major subject area such as system overview, system messages and application programs. The appropriate modules are selected, the table of contents is generated and the document is under way."

The writer, guided by the standardized paragraphs and transitional text contained in Promptdoc, fills in the blanks with specific system information, she explained. The software provides a generic outline structure combined with specific headings. Thus, the developer is asked to provide information within the format without having to create the organization.

"This methodology is flexible enough to allow writers to include specific information in their own style and in as much detail as needed," James said. "The document is completed when all the modules have been completed."

Promptdoc allows writers and developers to define the organization of the document at the outset of system development. "Resultant documentation flows more in line with the usage of the system itself," she said. "By the time the system is complete, so is the documentation."

Writers who lack a technical background can follow the format without relying heavily on systems developers. Writers are now able to generate 70% to 90% of the original documentation, James noted.

The Promptdoc format, with narrow text, white space and callout headings, is very easy to read, she said. "Each document includes a master index that lists and briefly defines all modules in that document. And the first page of each module contains a table of contents, complete with page numbers, for that module.

"Because Promptdoc is not forms-oriented, it is readily adaptable to word processing technology, in our case a Wang [Laboratories, Inc.] VS-90," she said. "The entire Promptdoc workbook is automated on our word processor using glossaries."

Glossaries are programs that step the writer through each module, displaying standardized portions of the module and prompting for all required information, James said. The writer enters the information and depresses the execute key to proceed to the next section. The system automatically displays the section heading, tabs to the appropriate position and prompts for the required information.

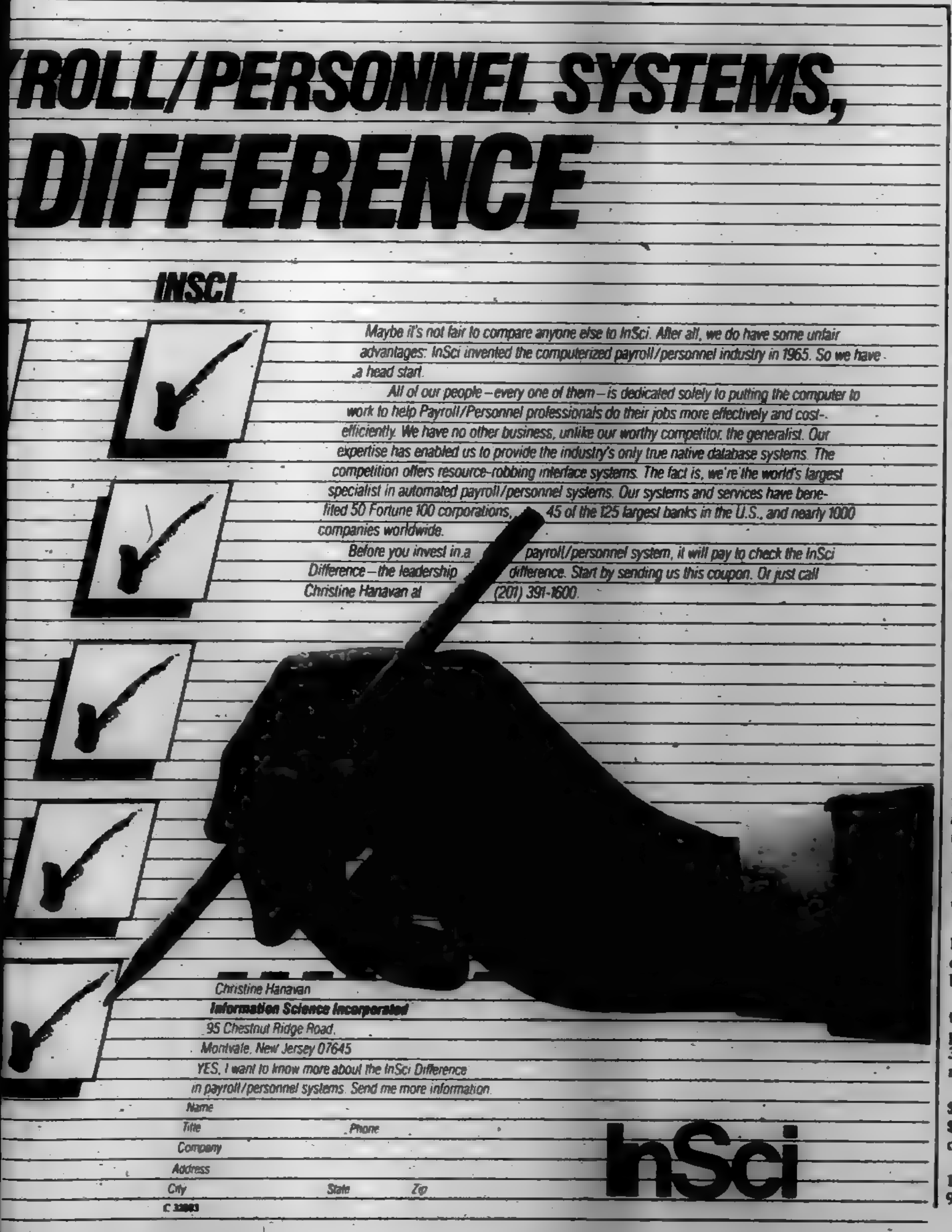
Report Compares 300 Minis, Micros

IRVINE, Calif. — Easy Data Corp. has announced a research report that compares features and prices of small business computers.

Called "Computer Comparisons," the report includes more than 100 pages of information on more than 300 models of minicomputers and microcomputers, its publisher said.

A single copy of the report costs $50. A semiannual subscription costs $80 and a quarterly subscription costs $120.

Easy Data is located at Suite 338, 1600 Dove St., Newport Beach, Calif. 92660.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Agriculture Department DP Center Grows With Cache, Not Disks

FORT COLLINS, Colo. — Planning ahead is more than a practice here at one of U.S. Department of Agriculture's (USDA) computer centers — it's a requirement.

For instance, realizing that conventional add-on disk subsystems would not provide its computer system with enough storage to handle the increasingly complex needs of the agencies it serves, the center purchased five cache disk subsystems to solve its problems.

When the DP staff at the Fort Collins Computer Center (FCCC) began evaluating the performance of its Sperry Univac 1100/84 and 1100/82 systems a little over a year ago, it quickly realized the systems' major constraints were their I/O subsystems.

"It wasn't a serious problem at the time," noted John Thoelke, FCCC's deputy director, "but our staff projections told us that this constraint was imminent. The work at the center used to be evenly divided between a business work load and a scientific one, but this was no longer the case. The work loads somehow merged, and everything we did seemed to require accessing a lot more data."

The two systems provide information processing support to several USDA agencies, including the Forest Service, Soil Conservation Service, Food and Nutrition Service and Animal and Plant Health Inspection Service.

After considering product offerings from several makers of cache systems, FCCC bought and installed five cache disk systems from Amperif Corp. that hold up to 600M bytes each.

Thoelke claimed the cache systems have boosted the I/O throughput of the Univac systems by 400%, provided a larger storage capacity in a smaller space and reduced power and cooling costs significantly.

He pointed out that the increased storage capacity and energy cost savings are necessary if FCCC is to stay in business.

"We have to go out and justify the FCCC's existence by comparing ourselves with commercial services that offer similar data base information. Therefore, we have to get the ultimate capacity out of our systems, while at the same time keeping our support and operating costs as low as possible."

Forest Service Program

The Forest Service uses a program, called Timber Sales Accounting (TSA), that was developed by the center. It is one of the more complex programs the center has online.

The FCCC-developed program performs every timber sales accounting function from the time a timber sales contract is awarded through the contract execution. "We are supporting the nationwide TSA system, and this is the first time we've been able to put it on one system across the Forest Service," Thoelke said.

Besides the five cache disk systems, the center also purchased from Amperif 15 disk subsystems made of 134 disk drives storing 54G bytes of information, three magnetic tape subsystems containing 32 tape drives, 13 telecommunications subsystems containing 560 terminations, eight processors, five controllers, three printers and various card readers and plotters.

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TORONTO — The rocky shores of Nova Scotia, the woodlands surrounding Saskatoon, Sask., and the urban sprawls of Toronto and Montreal geographically do not have a lot in common. However, each location has been the subjects of thorough scrutiny and analysis — not by a government agency, but by a computer-based analysis system operated by one of Canada's leading grocery store chains.

Dominion Stores Ltd., with more than 240 locations, subjects all potential store sites to an extensive profitability investigation that looks at a number of factors including economic, social, geographic location, population density and historic and projected sales figures. The firm had been using a Fortran-based system, called Fipac, through a service bureau for its cost/benefit analyses, but recently brought a financial control and analysis package in-house to run on the its Sperry Univac 1100/60 mainframe, explained Doug Ward, director of corporate planning at Dominion. "We had reached a point . . . where it was plainly no longer economical to continue operating as we had been," he said. "Our data storage costs had increased to the point where it was decided to bring everything in-house onto a purchased management decision support system."

After looking at five packages, Dominion picked Financial Control System-Evaluation & Planning Systems (FCS-EPS) from EPS Consultants, Inc. of Toronto, to run on the company's Univac 1100/60.

"FCS-EPS was selected for a number of reasons," Ward said, "not the least of which were powerful financial subroutines, an English-like command system, and its ability to accept user-created input messages. [It's also] an excellent financial projection and budgeting tool."

Ward explained how it takes three departments to perform a cost/benefit evaluation for a potential site: the research department analyzes a site's geographic location, population growth and trends, sales potential and historic sales patterns. Concurrently, the real estate department analyzes economic factors such as rental or purchase costs, interest rates, construction costs and various other investment factors. All this data is then passed to corporate planning, input to the company's business models to project performance analyses on future costs, sales, depreciation or a number of other factors.

"It typically takes two years from initial analysis of a site to the day we open the doors for business, mostly because of real estate considerations," Ward noted.

Hands-On Use

The FCS-EPS' English-like command system allows for hands-on use by research and financial personnel, according to Ward. "The people working most closely with the site analysis can input their data directly. This effectively eliminates a dependence on the data processing department to get what we need."

While FCS-EPS is a useful tool in the cost/benefit analysis process for individual sites, it is of equal value and importance in the company's corporate financial planning, Ward maintained. The system's forecasting capabilities are utilized corporatewide, with "a large model that simulates the operations and financial position of each company on a quarterly basis. Five years' history is stored in the model and used in projecting the various revenue and expense accounts using the FCS-EPS forecasting module.

"Using this forecast, we can adjust our pricing levels to assure a profit for the company and its shareholders, while still maintaining a competitive price level that is attractive to our customers," he said.

QED Sciences Releases Reports On Software

WELLESLEY, Mass. — "Information Resource/Data Dictionary Systems" and "Data Base Management Systems for the Eighties" are the titles of two recently released reference reports from QED Information Sciences, Inc.

The first, by Henry and Sandra Lefkovits and Edgar Sibley, is said to present an in-depth look at current uses and features of data dictionary systems and goes on to describe eight commercially available systems.

The latter reportedly provides information on eight popular data base management systems, itemizing each package's data manipulation features, query capabilities, programming considerations, relevant access methods, communications facilities, and system installation specifics, according to the publishers.

Both reports are priced at $95. They are available from QED at P.O. Box 181, 180 Linden St., Wellesley, Mass. 02181.

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PHILADELPHIA — Computerized foreign trade operations not only help assure exporters of prompt payment, but they are providing Fidelity Bank of Philadelphia with new marketing leads.

Philadelphia's fourth largest bank issues some 400 letters of credit and 150 documentary collections monthly. Before the bank automated these transactions in 1979 with Cupertino, Calif.-based Four-Phase Systems, Inc.'s IV/65 system, the clerical staff typed each one individually.

"Because much of the verbiage in these documents is boilerplate, a good deal of clerical and management time went into typing, proofing and correcting them," said Thomas J. O'Rourke, vice-president of financial operations.

Words and Data

To speed up the process, Fidelity officials decided the bank needed a computer system that combined word processing for the text of the letters of credit and data processing for storing various data fields such as amounts, dates, currency, payment terms and the names and addresses of the various parties associated with each credit.

Using Four-Phase's Vision software package, O'Rourke developed applications that are used in many other areas within the Financial Operations Department. The applications enable his staff to prepare budgets, issue E bonds, trace customer problems, order supplies, report employee attendance, check tickler files and assist in the purchase and sale of foreign cash.

Since August 1982, the Credit Analysis Department has utilized Foreword, the vendor's word processing package, to prepare credit reports. At that time, there were three full-time typists and 10 analysts. Temporary help was required to keep up with the typing work load. With word processing, O'Rourke said, there is no need for temporary help and typing efficiency has almost doubled.

O'Rourke said the bank based its system selection on three criteria: multifunction capability, ease of operation and ease of programming.

After six months of evaluating five different vendors, O'Rourke said, Fidelity installed a Four-Phase IV/65 system with 12 multifunction workstations, 384K bytes of memory, 12.5M bytes of disk storage, three character printers and one 120 line/min printer. The bank has since upgraded to an IV/95 system with 32 workstations, 768K bytes of memory and 67M bytes of disk storage.

Fidelity also uses the IV/95 to handle the paperwork in its Foreign Check Collections Department. After the customer's checking account number, the currency denomination and the amount of the check have been entered, the system obtains the customer name and address from the bank's main IBM data base and obtains from its own data base the name and address of the foreign bank where the check will be sent. An advice and the check is then sent to the foreign bank with a copy forwarded to the customer. When the foreign bank remits the funds, the IV/95 produces all the accounting entries required to settle the transaction.

Fidelity's New York branch has also installed an IV/65 and uses the same applications developed by the Philadelphia office.

Automation Adds Four Benefits

PHILADELPHIA — Fidelity Bank's transition to automation has resulted in four primary benefits to the bank, Vice-President of Financial Operations Thomas J. O'Rourke observed:

- A temporary clerical staff is no longer needed.
- The number of forms required to process a letter of credit or documentary collection has been reduced from 20 to two.
- New marketing leads are generated through monthly reports listing all beneficiaries of the letters of credit and documentary collections.
- Because each terminal is multifunctional, the clerical staff can use its word processing capability to correspond with customers as well as interface directly with the IBM mainframe data base to obtain information needed prior to paying out funds for a particular transaction.

O'Rourke pointed out that a number of significant productivity improvements have occurred at Fidelity since the minicomputer-based system was installed. In addition, developing the software in-house has cost considerably less than purchasing various packages from software vendors, he said.

As for training on the system, O'Rourke added, the bank has relied on informal training sessions among employees.

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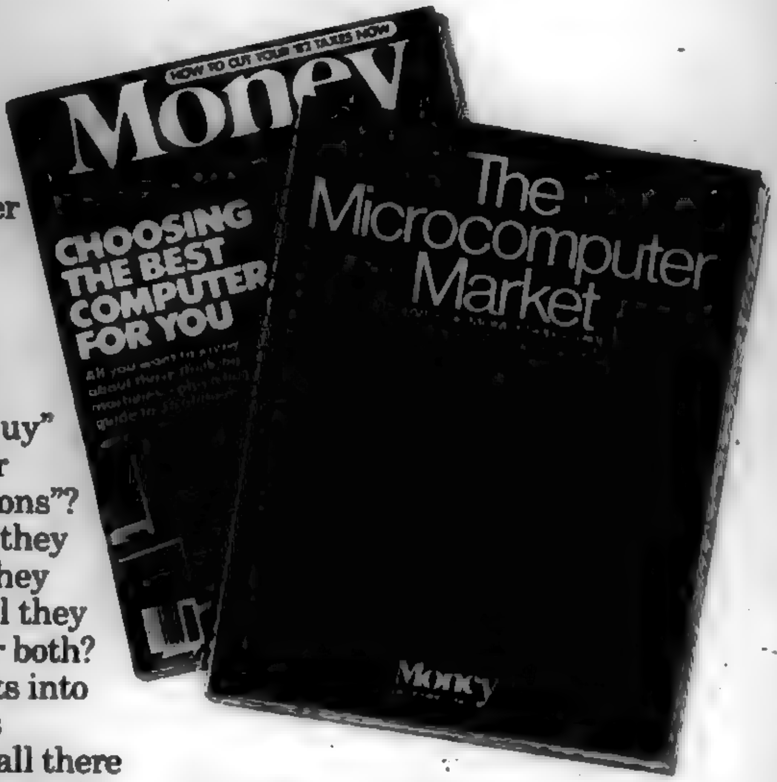
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AMERICA'S FINANCIAL ADVISOR

System Helps Supplier Keep Mailings, Inventory Updated

WILMINGTON, Calif. — A minerals-processing equipment supplier here faced a dilemma two years ago. It had a customer mailing list of more than 100,000 names and a several-thousand-piece inventory made up of 1,800 different items. Both the mailing list — a carefully cultivated business tool developed over the course of 23 years — and inventory were in constant flux.

Keeping them up to date was becoming more than the small staff at Sepor, Inc. could handle. "The mailing list is constantly growing as contacts move and new customers are added," explained Tom Alessio, vice-president of finance. "It penetrates to the requisitioner, the people that place the orders, the people we want to communicate with."

Worldwide catalog mailings help Sepor drum up some $1.7 million to $2 million in sales annually. The firm's products range from laboratory scales to heavy equipment such as ore and coal crushers.

Until 1981, the company used a service bureau to manage the mailing list. Although the service did the job well, it didn't give Sepor the flexibility to conduct business the way the firm wanted.

The service bureau printed out mailing labels when requested, Alessio noted, but "we didn't have much control." Realizing that the firm needed a way to access and update the list's data easily for day-to-day reference, in 1980 Alessio started a year-long shopping expedition for a computer.

Besides power and a large storage capacity, the firm needed a computer that could contain both the mailing list and the inventory/order entry data at the same time. Alessio didn't want to face shutting down his order entry system and taking it off the computer every time he wanted to update or print out the mailing list.

Alessio examined equipment from Digital Equipment Corp., Microdata Corp. and Applied Digital Data Systems, Inc. (Adds). A combination of "price, capacity and flexibility" led him to choose Adds' Mentor system, he said.

System Configuration

The Mentor system is comprised of a processor, tape drive, Texas Instruments, Inc. TI 810 printer and Adds Viewpoint terminal. Installed in November 1981, the system has 128K bytes of random-access memory and 30M bytes of rigid disk storage.

"The price was right for the storage capacity I was looking for," Alessio noted. "In the same price range, other systems were offering only a third as much storage. That didn't give me the flexibility I wanted."

The real key to Mentor's success at Sepor is the flexibility of having a powerful, data base-oriented computing capability in-house, he said. Through Adds' Info/Access, Alessio can now manipulate the mailing list and inventory/order data bases any way he wants to.

"We're designing reports from the data base of the mailing list that we would have had to request be written by the computing service we had," he explained. "They certainly could have done it, but it's a lot easier to do the modification right here on site. We see what we're going to get and then we generate it. Simple."

For the last four months, the system has run smoothly, Alessio said. There were "a few major problems," the first year, "but they came and fixed them," he recalled. Those problems encompassed "just about everything — disk drive, tape drive, new boards."

Even with problems, however, Sepor's operations were impacted "very little," he noted, due to the batch nature of the processing.

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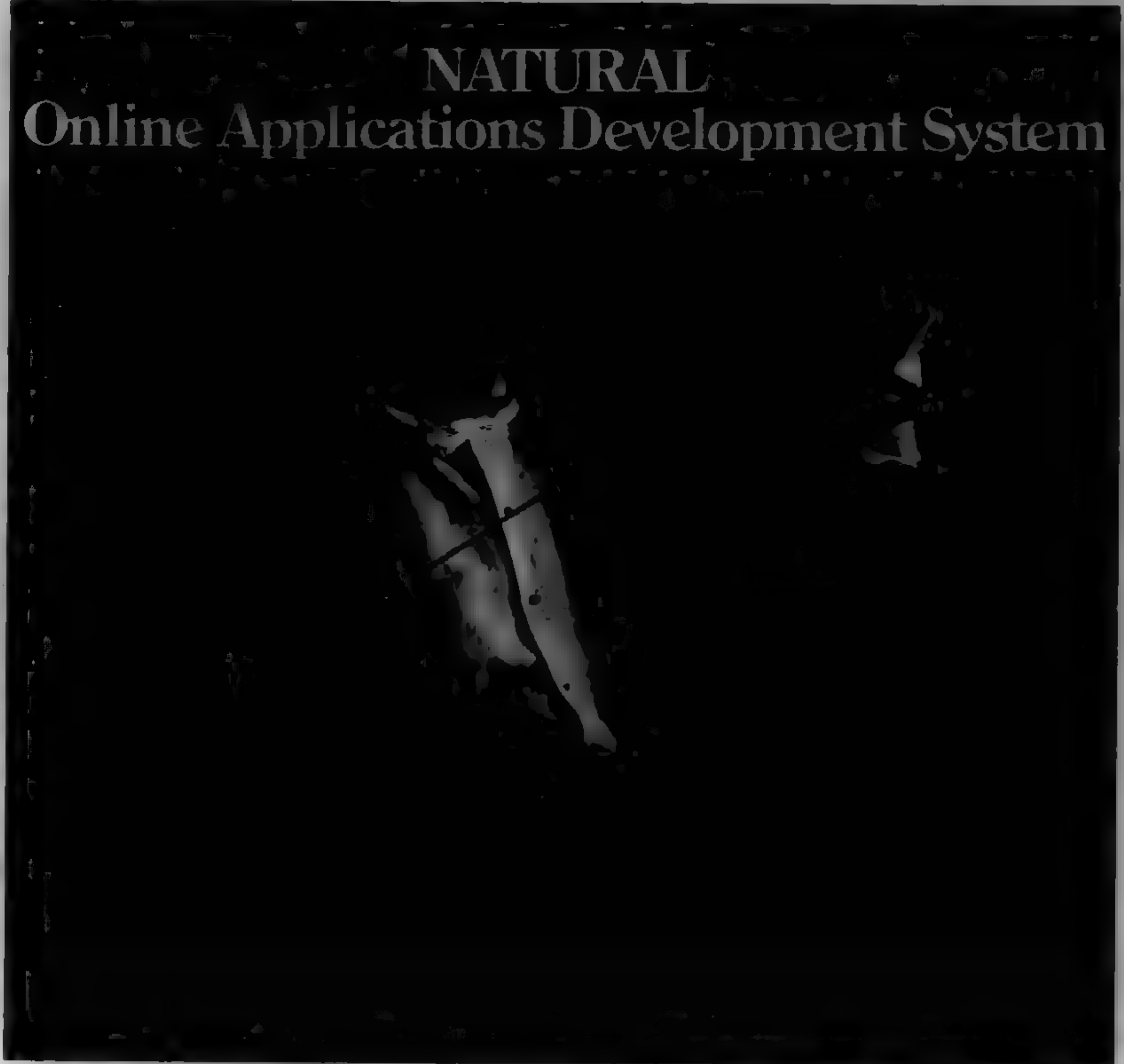

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Scheduler Controls Hospital's DP Operations

ATLANTA — A computer-aided scheduling and reporting system helped a university hospital here to organize and gain control of its work load.

The 600-bed Emory University Hospital, part of Emory Medical School, is a leading facility in the South for coronary bypass operations. It also performs more cornea transplants in its eye care center than anywhere in the nation.

The hospital's data processing staff of 35, which utilizes an IBM 4341 computer running under DOS/VSE, was in dire need of an automatic scheduling system to organize its activities. "Based on our backlog, it would have been expensive and difficult to justify a few man-years to develop our own scheduling system" rather than acquiring a package, Bob Attaway, manager of computer operations, said.

In March 1982, the DP department chose Software Concepts, Inc.'s Computer Scheduling and Reporting (Csar) system. It made its choice based on recommendations from other Csar users.

Known to Few

Prior to Csar, all the schedules were "in everybody's heads" and runtimes were known to only to a few. "In our implementation, we worked up a new naming standard, and for a few hours each day, we systematically put on one system at a time and made sure it was scheduling properly," Attaway said.

At the same time, the DP staff used Csar as an opportunity to clean up its JCL. Previously, having JCL in card format made it easy to change jobs without letting the scheduler know about it. But by eliminating the card system, the DP department has gained complete control over the environment, Attaway said.

In addition, system security has increased because, with Csar reports, the staff knows everything that is run on the system.

The nature of the work handled by the hospital's DP department dictates definite processing criteria. With its nursing management system, patient administration, budgeting and financial reports, order is critical because processing depends on earlier input.

If "jobs run just a little out of order, it causes a great deal of harm," Phil Fowler, senior systems analyst, said. "If you want to be sure all your jobs meet a certain standard or run on a specific day of the month or in a particular order, Csar provides a good opportunity to do that."

In the past, often the only way of knowing the status of a particular job was by asking the operator. "Now that's all controlled by the system; we know the jobs are run," Attaway said. And "you can't put a dollar figure on forgotten jobs and reruns," according to Ed Brown, assistant director of DP.

In turn, users' complaints have fallen off as the department's credibility has risen. "We now have peace of mind because we've eliminated those missed and out-of-sequence jobs," Attaway added.

Operating Efficiency

Efficiency of operation is another benefit cited by Brown. "When Csar was fully implemented, we immediately noticed a change in the efficiency of our operation," he said, crediting that change to rerun control and on-line automatic submission.

By having the jobs automatically submitted by Csar, the operator no longer has to find and load cards, allowing him to be more efficient.

Also, the shift manager and the operations manager, who jointly worked on the formal written schedule, are freed of that time-consuming task.

According to Fowler, Csar is "reliable, easy to use and the manual is fairly easy to understand." The hard-copy schedules serve as both a management tool and as a history.

Additionally, in a disaster recovery situation, since Csar has all jobs identified, it can back up to tape and recover them.

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Firm Finds New Backup System Worth Risk

SAN FRANCISCO — There is a certain amount of risk involved in becoming one of the first 12 users of an unproven software backup system and moving away from a comfortable home-grown computer system. However, in doing so, a large construction company here has not only saved a great deal of time, but has saved a lot of money.

"Our homegrown system was so inadequate, we decided to try it," explained Bob Perkins, manager of systems programming at Guy F. Atkinson Co. "The in-house project using IBM's Tape Dump program to provide VM disk backup to tape was ridiculous. The backup took 4½ hours and six reels of tape each night."

In December 1981, Perkins accepted a trial installation of a product called VMbackup from VM Software, Inc. of Falls Church, Va. The firm's computer system consists of two IBM 4341 Model Group 1 processors running VM/SP and utilizing Control Data Corp.'s 3350-equivalent, double-density disk drives.

According to Perkins, when a terminal user required that a previously backed-up file be restored from tape to the user's minidisk, operations people had to locate and search through the printout that cross-referenced the backup by tape volume serial number, the user's file number and date submitted. They then had to mount the tape to restore the data.

In addition, the modified Tape Dump system had to be rewritten every time that IBM came out with a new release of its VM/SP.

"With VMbackup, the nightly backup operation took only 20 minutes to half an hour and less than one reel of tape," Perkins said. "In addition to saving computer time and 27 reels of tape a week, we found that new release upgrades were trivial. That allowed our systems programmers to have more time to work on other tasks.

"We also found that VMbackup's on-line catalog greatly enhanced our system integrity, since it eliminated cross-referenced printouts and reduced the chance for human error."

As VMbackup went into production, Perkins' staff discovered additional benefits. For example, when recent hardware errors caused two of the disk volumes to be unusable, the disk volume was replaced and 187 minidisks were restored from tape by VMbackup in four hours.

"We would have had to work for 16 straight hours to restore those minidisks with the old system," Perkins claimed.

"This system does everything you can reasonably expect from a VM backup/restore environment. I think we got a great value for our investment. After all, our job is to provide a service to our users, not write custom utilities for VM," he said.

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DCA Seminar to Cover Fourth-Generation DBMS

LYNNFIELD, Mass. — Digital Consulting Associates, Inc. (DCA) will be conducting a seminar on fourth-generation data management June 20-21 at the Tarrytown Hilton in Tarrytown, N.Y.

The seminar is said to condense information gathered by DCA as sponsor of the 1983 National Data Base Management Symposium. The two-day meet will explain how data base management system (DBMS) methodologies are tied in with recent developments in high-productivity software.

DBMS integration with teleprocessing, report writing, query, dictionaries, application generators, decision support systems, graphics and data base designers will be discussed and analyzed. In addition, software for all sizes of hardware from personal computers to megacomputers will be covered.

Dr. George Schussel, DCA president and chairman of the National Data Base Management Symposium, will lead the seminar. All seminar attendees will receive DCA's 400-page workbook "4th Generation Data Management," which reportedly provides detailed product information on the most widely used data management software.

The seminar costs $650. More information is available from DCA, which can be reached through P.O. Box 97, Lynnfield, Mass. 01940.

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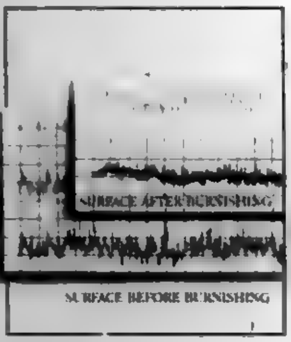

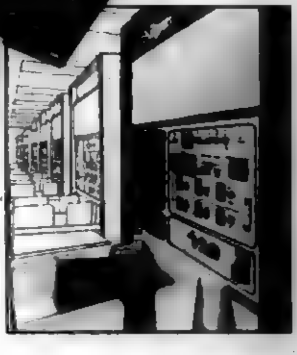

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Nursery Plants System Upgrade

SACRAMENTO, Calif. — Oki Nursery is evidence of the fact that no matter what business you are in, there is a role for computers to play. One of the largest wholesale nursery operations in the West, the company recognized the need for something more than ledgers, adding machines and manual billing and filing procedures in running an efficient agribusiness enterprise.

Oki Nursery distributes landscape ornamental trees, shrubs, plants and greenhouse crops all over the country. Based here, it has branches in San Jose, Calif., and Portland, Ore. It utilizes an IBM System/38 small business system for applications that include getting the picking labels out to the Production Department, sorting out the flats of bedding plants by variety, organizing priorities for shipment and setting up truck routes.

Oki Nursery uses the computer for such functions as electronic mail and management reports.

The firm recently upgraded to the System/38 from a System/3. "The System/38 has allowed us to extend our data processing abilities to our branches by use of a special series of telephone lines. It's amazingly fast and has made our programmers from two to three times more efficient," George Sam Oki, vice-president of administration, claimed.

Oki Nursery, a family-run business, first became involved with computers in the early 1960s, when it acquired an IBM 1403. In 1970, the System/3 was introduced.

The System/3 "was a real computer, and we were able to build on it to satisfy fully the needs of the time. Its main purpose was to facilitate us in providing up-to-date information regarding crops and order status," Oki said. "It was particularly handy when it came to holiday bookings, such as Christmas, when items such as poinsettias are major sellers. We have one basic target date — Christmas day — and we could send our sales force out in the field to book orders. We gathered estimates on a number of sales, the performance of [salesmen] and how many units we could expect to deliver."

Should Office Push for Own Micro?

Turnaround Time
By Larry E. Long

Q Last year, we purchased a microcomputer and Visicorp's Visicalc software for the company accounting office. The micro was idle for about six months until someone decided to figure out how to use it. Since then, half a dozen people in our office and at least as many in other offices keep the system tied up. To alleviate this bottleneck, we decided to order three more just like it.

Our policy on hardware acquisition was recently revised. Now, all micro and word processing purchases must be approved by the Hardware Committee in the management information systems department. As its first official decision, the committee denied our request. The reason given was that we had just purchased several accounting systems that would provide us with similar or better capabilities.

These systems will not be implemented for at least a year. We look forward to that, but what about now? We have an overloaded $5,000 micro that has paid for itself many times over.

The purchase of these micros is a matter of continuous debate. The committee wants to hold down the proliferation of micros within the company (we now have two). Money has never been a question.

Do you think we should give up the idea of purchasing the micros or keep the issue alive?

A I, too, am against the uncontrolled proliferation of micros and word processing equipment. You, however, have an established need and an immediate opportunity to increase productivity. It sounds a little like the Hardware Committee is overemphasizing the proliferation issue. In so doing, it must have lost sight of the fact that for $15,000, life can be made a lot easier for people.

Keep the issue alive.

Q I have worked in data processing for six years. My experience is in operations and administrative positions. Currently, I am a DP librarian.

Without programming experience or post-secondary education, what can I do to further my DP career?

A What are your career goals? If you wish to move up the operations and administrative ladder or into systems development and/or management, you should pursue an associate or bachelor's degree. A college degree is an implied or explicit prerequisite in most organizations for programming, analyst and management positions.

Q After spending three years in DP, I quit and am now working in a non-DP-related business. No longer do I worry about inefficient code, inconsiderate users, unrealistic deadlines and bloated egos. My health and attitude have improved and my future looks brighter than ever.

Several of my former colleagues want to change careers, but probably will not. I wrote this letter just to confirm that there is life after DP.

A The computer field is not everyone's cup of tea. Tens of thousands have stepped blindly into the field of "opportunity." The average community college will have 400 to 500 students in its DP program. One has 10,000. Combine these graduates with those of four-year institutions and you have an enormous number of people entering the DP job market each year.

With this kind of volume, a few misguided career decisions are inevitable. I am happy you have found success.

Q You recently answered a question which, except for some minor details, I could have written myself three years ago — the question about retiring from the military and having 10 years of DP experience in management.

In theory, your answer was a good one. In practice, it just isn't so. I recruited extensively and received several offers, but all were for programmer positions, not management.

I may work back up to management some day, but for the moment I am back to slugging it out in the programming trenches.

A I thought then and still believe that the education, skills and performance record of the original correspondent were unique and highly marketable. Over the years, many of my correspondents have been retired military DPers. I invite those who have sought DP jobs to give me some feedback on the job situation and on attitudes toward hiring retired military DPers. I will compile the responses and try to paint the "real life" picture of the employment prospects for this rather large group of people.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*

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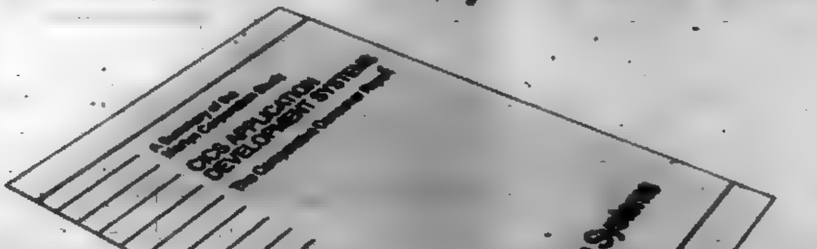
A Summary of the Merlyn Corporation Study
CICS APPLICATION DEVELOPMENT SYSTEMS
The Comparative Consumer Report
Prepared by: Cincom Systems

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For a more detailed summary of the Merlyn A.D.S. Study, return the coupon at right. Or contact our Marketing Services Department. (In Ohio: 513-661-6000. In Canada: 416-279-4220.) **800-543-3010**

*"CICS Application Development Systems: The Comparative Consumer Report." Written and published by MERLYN CORPORATION. Survey data from Focus Research System, Inc. 1982.

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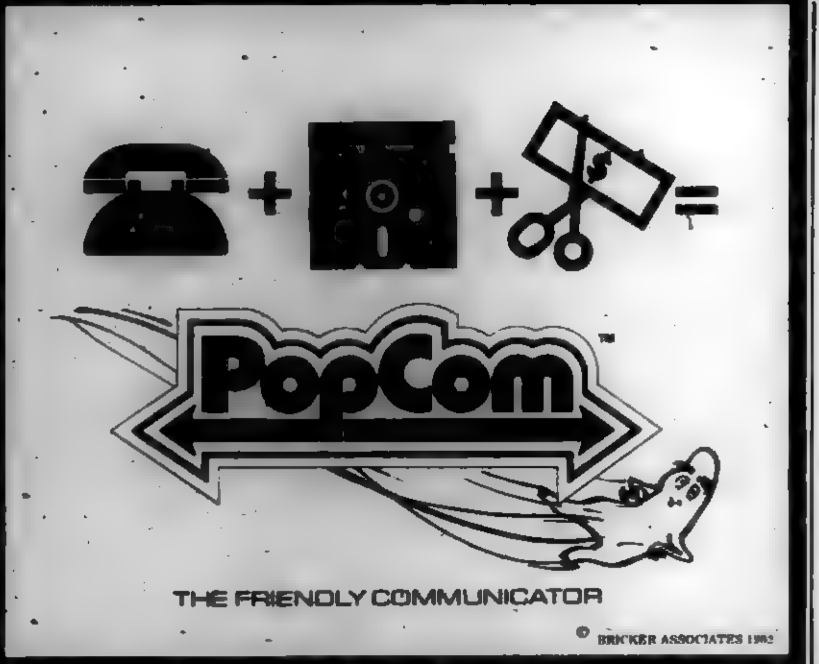

Gas Pipeline Firm Fuels Conversion With System

HOUSTON — An on-line applications development system for CICS has proven to be both a time and manpower saver for the data center of a gas transmission company, resulting in productivity gains of up to 200% for at least one application.

The Texas-based Columbia Gulf Transmission Co. runs gas pipelines offshore and in six states and has about 700 employees, 21 of whom work in the DP area. Although the firm has an IBM 4331 running under DOS/VSE, a sister company purchased a non-IBM system. The subsequent conversion project, which involved changing about 100 screens from a Hewlett-Packard HP 3000 to a 4331 format, fell to Scott Adams, manager of systems and programming for Columbia Gulf Transmission.

"I had four months to accomplish the task, and we did it with [Pansophic Systems, Inc.'s] MIS/OL," he said. Adams explained that the HP 3000 system was purchased in October, and his group was asked to complete the conversion by March 15. "There was no way we could do this using command-level CICS coding," he said.

A minimum of one man-week per screen would have been required for the conversion project without the use of a development tool. This comes out to approximately 24 man-months vs. the four man-months needed using MIS/OL, Adams said.

With time a critical factor, Adams selected five software systems for review: IBM's DMS, Oxford Software Corp.'s UFO, Art Benjamin's (of Canada) Act 1, Cincom Systems, Inc.'s Mantis and Pansophic's MIS/OL.

Time Constraints No. 1

Due to time constraints, cost was not a major factor. The two primary criteria were "how fast we could put the system in and whether we could get the payroll system up and on-line within the installation period," he said.

Adams tried to get each system in for a free trial period and succeeded with DMS, MIS/OL and Act 1. Another sister corporation, Columbia Gas Service Co., was running Mantis, so Adams was able to collect data from that firm. From there, Adams looked at the benefits of each system. Thirty days after he began his search, he settled on MIS/OL — despite the fact that it was the most expensive choice at the time.

Among the benefits Columbia Gulf found with MIS/OL were an ad hoc query facility (report writer); an on-line application tool that allows users to "have small applications up in an hour without coding a line"; superior data security, "right down to the data elements"; recovery capabilities; ease of use; and no new language requirements, according to Adams.

More specifically, "MIS/OL protects us from CICS problems that have plagued many data sites. We have not had a CICS dump in three months," Adams said. Also, it took about two weeks for users to become comfortable with the software, which he said is reentrant and does not take up a large number of resources.

Adams singled out MIS/OL's provision of access to any file structure as a definite plus. Columbia Gulf's payroll and personnel files are all Vsam and MIS/OL is used to access them, he said.

In an integrated petroleum accounting system with eight subsystems, Adams has "seen a jump in the neighborhood of 150% to 200% in productivity vs. CICS command level."

Now that the conversion project is completed and Adams has had time to evaluate his purchase, he "would have made the same decision."

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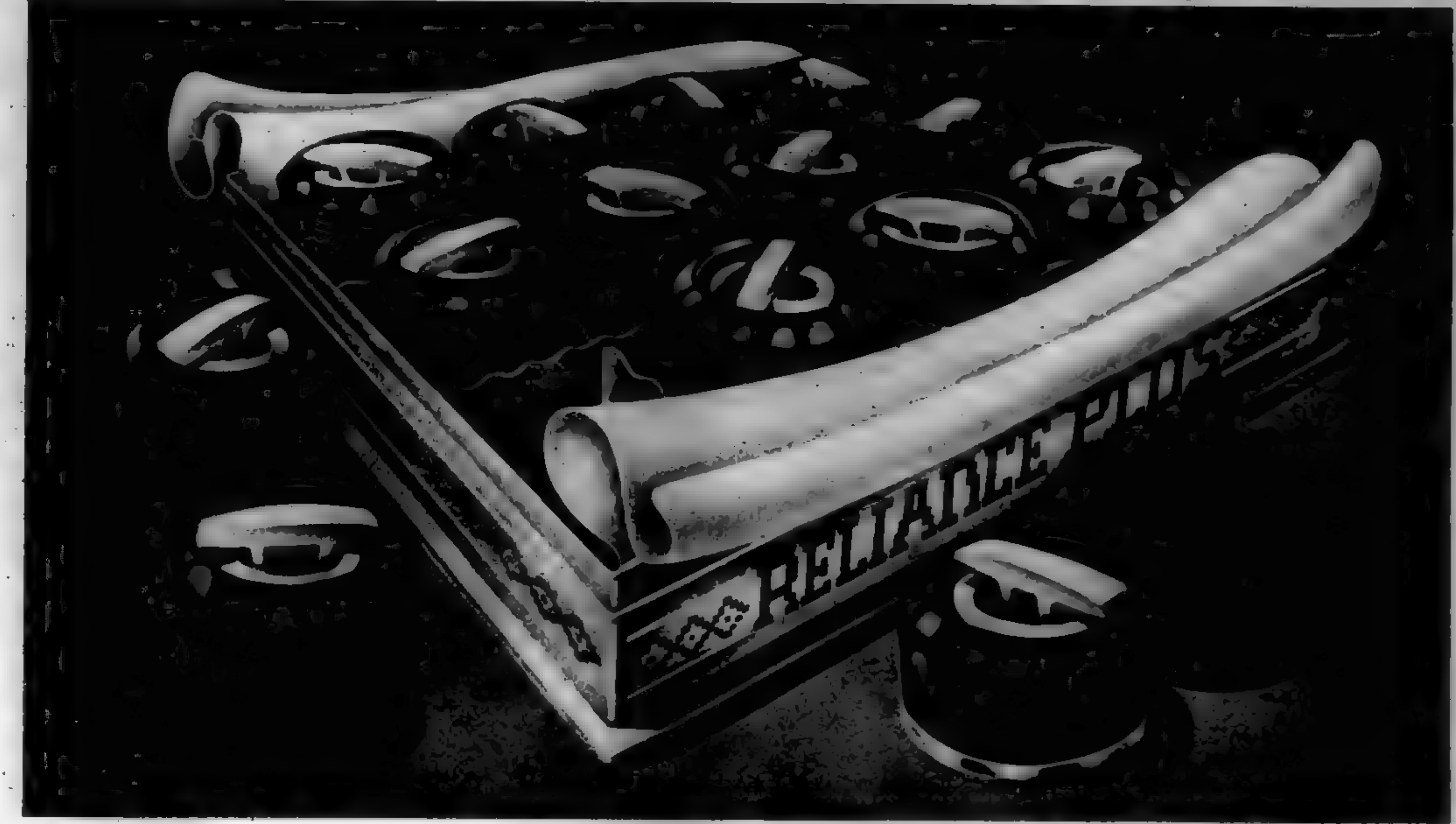

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Data Dictionary Cuts Red Tape for Blue Cross

BUFFALO, N.Y. — The use of a data dictionary has reduced paperwork, increased accuracy and provided on-line capabilities and disaster protection for Blue Cross of Western New York (BCWNY) here.

With more than a million members in eight counties, BCWNY operates its data center primarily in a centralized environment. "We put a lot of emphasis on data base administration, and the data dictionary is an integral part of that," noted Gary Kerl, director of systems services.

The shop has an IBM 3032 running VS1 and an array of peripheral equipment, including about 120 CRTs for use by clerical and management personnel. The group brought in IBM's IMS data base management system in 1976, and University Computing Co.'s UCC Ten Data Dictionary/Manager was installed later that year.

UCC Ten's basic functions are to manage file definitions for data base and conventional systems, end-user computing, documentation and the IMS environment.

"One of our major efforts in using the dictionary is a file definition project," explained Tom Robinson, data base administrator. "We have a lot of systems that were written years ago, even before we brought in IMS. In some instances, we have 40 to 60 programs accessing the same file."

Project Requirements

The project requires that all the data elements be defined and that a common I/O area be created for them. These definitions are used to enhance program maintenance, promote common understanding of the data that exists among users and DP personnel and are also used as a basis for data base design in new systems.

This gives the data base administration department a good handle not only on the data base management side but also on all other files, Robinson explained. The programs are then converted to utilize the new I/O area.

Several programs were written as a result of this effort, he added. One of the first gave the designers more material to work with when customizing programs. It combines what BCWNY's final Cobol source would resemble with the definitions from the UCC Ten dictionary.

Using this concept, the designer can make a brief note on that report for a field and the programmers can work from this without having to know any more about the field. They know what the field location is, what the definition is and what the attributes are. They also have the Cobol source entry that they will eventually code into the program.

"We feel that for our end-user computing to be effective and efficient, the information center should be closely tied to the data base administrator," Robinson said. "To handle this, one person acts as a coordinator for a particular end-user language.

"This individual then utilizes the data base administration information to help the user generate reports from production files and, in some cases, helps them to create their own files," he added.

Even though the shop is mainly Cobol, this plan relies heavily on languages such as Informatics General Corp.'s Mark IV and SAS Institute, Inc.'s Statistical Analysis System (SAS) in user areas as well as DP.

Thus, it's important to keep that consistency in the dictionary so that it is still the same field, the same file and the same definition regardless of language or user. "We have a program that will take a UCC Ten glossary by segment ID and generate input for a Mark IV glossary generation, as well as an SAS I/O area," Robinson explained.

Documenting the IMS environment is the most obvious benefit BCWNY has had from the data dictionary. The data base administration staff creates program documentation and data base and segment documentation.

Some library audit programs are in place already and more are scheduled. Anything new that is developed relative to data base segment descriptions or program information is handled through the dictionary.

Gardulski to Head ISO Groups for Ansi

NEW YORK — Joan Gardulski has been named program administrator for the Information Processing Systems Department of the American National Standards Institute (Ansi). Gardulski will administer the secretariats of a number of subcommittees of the International Standards Organization (ISO). Ansi is the U.S. member of ISO.

Gardulski will be responsible for four subcommittees of ISO Technical Committee 97, Information Processing Systems: programming languages, flexible magnetic media, instrumentation tape and representation of data elements.

In addition, Gardulski assumes responsibility for a subcommittee on data elements and interchange formats of ISO Technical Committee 154, Documents and Data Elements in Administration, Commerce and Industry.

She will also be responsible for providing staff support to Ansi's Information Systems Standards Board.

Operates in Different States

Data File Helps Firm Keep Pace With Tax Rates

NEW YORK — Something had to give at Management Assistance, Inc.'s (MAI) tax department if it was going to be able to keep pace with the company's rapid growth over the past decade.

MAI, the computer vendor whose Basic Four Information Systems Division is located in Tustin, Calif., and whose Sorbus Service Division is based in Frazer, Pa., emerged from near-bankruptcy in 1970 to a position within the 600 of the top firms among the Fortune 1,000. "We were just too busy growing, and the way we were preparing our tax returns was archaic," recalled John F. Hennessey, assistant treasurer for taxes. "It was like typing hunt-and-peck style, compared with using a modern high-speed electronic typewriter or word processor."

With Hennessey's urging, the tax department computerized its operations. However, the problem of determining the sales and property tax rates in the states, cities and counties in which MAI operates became a time-consuming chore. Hundreds of hours of work were required to determine and stay abreast of the tax rates in the various locations.

Faced with the prospect of alleviating or even eliminating the manual look-up procedures required to compile the massive array of sales tax data, Hennessey consulted with Ray Westphal, president of Vertex Systems, Inc. of Wayne, Pa., about his Salestax service, a computerized file of current tax rates for all sales tax jurisdictions in the U.S. and Canada.

Produced monthly in computer printout form and on magnetic tape, the Salestax data includes standardized tax data for all U.S. jurisdictions with populations from as few as 250 people to the largest cities in the country.

The service's file represents almost 42,000 locations, providing the combined city, county and state rates with the effective dates for each taxing jurisdiction. In addition, monthly updates from Vertex are designed to identify all changes.

Hennessey adopted the system in 1978 primarily because the Vertex tapes could be fed into the IBM 370 system MAI was running in its Tustin, Calif., location. Tax information therefore could be accessed and pulled from memory to apply the correct sales tax rates during billing periods.

Previous dependence on other tax reference sources had been less than ideal, Hennessey said. The published information was not standardized and, in many instances, it was inaccurate because it was out of date. With the Vertex system, for which information is received directly from the states and independent localities, the monthly tapes facilitate computer conversion. Staying abreast of tax changes by computer is becoming increasingly important because of the dramatic changes in state and local taxes, Hennessey noted.

Biggest Advantage

From Hennessey's standpoint, in addition to having the most current dates available, the biggest advantage is in "having a tape that completely automates the combined rate for total billing purposes." New York State, for example, includes state, city and county rates. New York City and its surrounding counties have an additional .25% rate for the area's transit system. This information is contained on the Salestax tape. When the system is applied to a particular location, the tape provides the current rate for each taxing jurisdiction, he explained.

"The system has proved highly valuable for billing customers with multiple U.S. locations," he continued. "No two taxing jurisdictions are the same, but this system helps to minimize the problem because the computer gives us accurate and instantaneous sales tax data to facilitate the billing operations. And, with the increasing dependence on local governments to support their own tax revenues, the problem of keeping up with changes will continue to grow."

For multiple-location customers, the appropriate tax rate is assigned for each location by a dash and/or a digit, he explained. The computer subsequently unscrambles the code and applies the correct rate to the installation location.

Further consultation with Vertex about a year ago led to MAI's adoption of a new service that provides property tax data in the form of hard copy. This includes the current property tax available for each location, as well as the names, addresses and phone numbers of the tax assessors in their respective locations.

As MAI continues to expand, its tax compliance requirements increase. "We process more than 6,000 tax returns a year, with sales and property tax returns comprising a major portion of this compliance, so we've set up a tax calendar that lists tax return and payment due dates in chronological order. Not a day passes that we do not use the system to meet sales and property tax compliance requirements," he added.

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Network Service Connects Insurer, Independent Agents

PHILADELPHIA — An insurance industry data processing network developed by the Insurance Institute for Research, White Plains, N.Y., was unveiled here at Reliance Insurance Co. this month. It enables independent agents with computer equipment to transact business with network member companies.

Called the Insurance Value-Added Network Service (Ivans), the agency-company computer linkup is scheduled to become fully operational in the third quarter of this year. Twenty-one property/casualty companies are currently members of Ivans, which was established in response to an insurance industry association proposal.

The principal goal of Ivans is to make electronic communication between agents and companies feasible and cost-effective, according to William Pollard, chairman and chief executive officer of Reliance. Additional advantages are expected to include reduced overall operational costs for insurance, agents and companies; elimination of duplicate equipment and procedures between agents and company systems; and a centralized facility via a toll-free telephone number for problem reporting and resolution.

Further details on the Ivans project can be obtained from Reliance headquarters at 4 Penn Center Plaza, Philadelphia, Pa. 19103.

APL83 Slated for April 10-13; Weinberg to Keynote Meet

ROCKVILLE, Md. — The annual International APL Conference will be held here April 10-13 by the Association for Computing Machinery (ACM) and its Special Interest Group for APL (SigAPL).

The keynote speaker at APL83 will be Gerald Weinberg, author of *The Psychology of Computer Programming*. Weinberg's speech is titled "APL — A (Very) Personal Language."

Other speakers will include Prof. Michael A. Jenkins of Queen's University in Kingston, Ont., who will speak on the development of the Nial language, which incorporates concepts from APL and Lisp; and Paul Berry of I.P. Sharp Associates Ltd., who will speak on practical approaches for designing APL programs with the user in mind.

Papers will cover commercial and scientific APL applications, file systems, data base management systems and others.

The registration fee for ACM and SigAPL members is $160 before April 8 or $180 at the conference. For others, fees are $185 or $205, respectively. Further information can be obtained from APL83 Registrar, I.P. Sharp Associates, Suite 305, 2033 K St, N.W., Washington, D.C. 20006.

Warnier Prize For Informatics Seeks Nominees

TOPEKA, Kan. — Nominations for the first J.D. Warnier Prize, recognizing outstanding contributions to informatics, are now being accepted through May 1 by the Warnier Prize Committee.

The prize will be awarded Oct. 11 at the 8th annual Data Structured Systems Development (DSSD) Users Conference here. Initial funding for the prize is being provided by Ken Orr and Associates, Inc., a computer systems research company that developed DSSD.

Named for Jean-Dominique Warnier of Paris, the prize was established recently to recognize major contributions to the theory and practical application of informatics, the science involving the analysis, design and implementation of information systems.

Recently retired, Warnier has been involved in data processing since 1956 — first as an analyst and programmer, later as a teacher and writer. His books on the logical construction of programs and systems have been translated from French into Spanish, Japanese, Italian and English.

Nominations should include a biographical sketch of the nominee and an explanation of his or her work in the field. They should be submitted in writing by May 1 to the Warnier Prize Selection Committee, Gerald Weinberg, Chairman, 1725 Gage Blvd., Topeka, Kan. 66604.

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Developed by Own MIS Staff

Package Saves $300,000 for Supermarket Chain

By Bob Johnson
CW New York Bureau

SCHENECTADY, N.Y. — More than $300,000 was saved by a supermarket chain here in the first year it used a Direct Store Delivery (DSD) software package developed by its management information systems (MIS) staff.

Price Chopper Supermarkets, a medium-size chain with annual sales close to $500 million, said that its DSD system helped save $200,000 in its first year of use by alerting the supermarket not to pay for unauthorized shipments and unannounced cost increases and keeping it from paying for promotion items priced higher than the usual rate. The system saved another $120,000 by allowing the transfer of bookkeeping functions out of the stores and into the company's headquarters.

The chain said that the very first error report generated by DSD listed products accepted at stores without authorization, cost differences of 25 cents for the same item at stores just five miles apart and, in one case, cost differences in deliveries made to different stores by the same vendor sales-delivery person.

"We knew immediately that the system would be a real asset in running the business," David Younts, vice-president of sales and merchandising, explained. "These are savings that recur every year, and their value actually increases in this inflationary economy."

The system runs on Price Chopper's IBM 4341 CPU under the DOS/VSE operating system and has six IBM 3270 data entry terminals connected to it. It is currently being marketed by IBM as an Installed User Program.

Dennet W. Withington, the chain's vice-president of MIS and one of the package's developers, said that the creation of the program proved that the DSD function could be brought under control. "It was not easy, and we had to convince a number of people along the way, but now everyone agrees the time, effort and money all of us put into our DSD system has been a solid investment," he commented.

The supermarkets are responsible for thousands of invoices monthly that have to be audited and checked against authorized contracts with vendors. In addition, the store receiver is supposed to verify that each shipment is authorized, count the load against the vendor's receipt and check the quantity of the delivered products.

'No Price Integrity'

This wide variety of vendor invoice forms made it difficult to keep an accurate count of store deliveries and quantity of products. "The situation begged for correction," Withington said. "In our case, which was typical of industry experience, there was no price integrity. We simply factored the vendor's cost by a given percentage to arrive at a price that should have yielded an appropriate margin. But that broke down when vendors lowered prices for special promotions, and DSD items are among the most heavily promoted we carry. We had no way of knowing whether we were making a profit with a vendor, let alone how much."

In an attempt to rectify the problem, Price Chopper increased its bookkeeping staff to audit further vendor invoices and apply retail price factors for deliveries. However, the manual system only yielded approximations at best and they were prone to error. Vendors' statements still had to be reconciled against the delivery tickets, and this was only done for 10% of the invoices, the supermarket said.

"Our first step was to create a data base to comply with unit price shelf tag regulations and to support universal pricing code [UPC] checkout systems. Every product was keyed by UPC code, described, identified by pack or unit, priced and linked to vendor or vendors and stores," Withington noted.

Withington explained that store "paper" or records of delivery invoices are received by the company's headquarters on a daily basis for blind entry into the system. Here, the DSD system checks the vendor contract cost for items against what was actually delivered.

"In this way we pick up errors in pricing and the delivery of unauthorized items," he said.

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Navaho Children to Learn To Speak English Language With Micro-Driven System

By Tom Henkel
CW Staff

COLUMBUS, Ohio — Researchers at Battelle Memorial Institute here have undertaken a project to teach Navaho children — whose language is image-oriented and rarely written — to speak English by using off-the-shelf microcomputers equipped to integrate images and spoken words.

While the idea of using computers as a teaching aid is not new, researchers here contend it may be the only practical way of bridging significant gaps between the English and Navaho languages.

Besides being image-oriented, the Navaho language is syntactically opposite to English, according to Dr. Jack Sisson, education and training program manager at Battelle.

For example, the literal Navaho translation of the English phrase "go see the black dog" is "black dog go see," Sisson said.

Since many Navaho children are raised with Navaho as their primary language, they often have problems assimilating into the English-speaking school system. Navaho children traditionally score lower on standardized tests such as the Scholastic Aptitude Test, but "it's not that they are any less intelligent," Sisson said.

Micro-Driven System

Battelle, a nonprofit research and development organization, was asked by the public school system of Chinle, Ariz., (part of the 7,000-acre Navaho reservation) to develop a microcomputer-driven training system that would incorporate an audio attachment to help Navaho children relate printed words with images.

However, the Battelle project is not aimed at developing a system based around a specific vendor's system. Instead, the institute is working to develop a transportable software package that can be used on a variety of off-the-shelf microcomputers — thus allowing other school districts to use the same program.

The transportability also would allow the system to be adapted for the various Navaho dialects, Sisson noted.

Still in the design stages, the package is being developed in UCSD Pascal, a transportable version of the Pascal programming language. When it reaches the final design stage, probably this summer, the package will incorporate a recorded dictionary of English and Navaho words.

The system employs a lot of graphic simulations, such as Navaho Help messages that present graphic interpretations of English sentences. "We've had to be very selective in the words we use," Sisson said, noting that Battelle is trying to fit the English-Navaho dictionary on one floppy disk.

Here again, the Navaho language presents some unique problems. Navahos have completely different ways of expressing phrases that are fairly similar in English. For example, phrases like "go to the trees" and "go to the pond" are very similar in English, but differ dramatically in Navaho.

The teaching package is being designed to offer several levels of sophistication. Sisson said a basic level, for example, would teach children to relate English words to Navaho symbols.

However, the system is also designed to offer English sentences with color-keyed words and scrambled English sentences.

Focus Users Form Group For New England

HARTFORD, Conn. — A group for New England users of Information Builders, Inc.'s Focus data base management system has been formed. Membership dues are not currently required, according to a spokeswoman.

At its initial meeting last month, the Focus Users of New England (FUN) approved a set of group objectives, a constitution and bylaws. The meeting was attended by representatives of 20 Connecticut-area companies that use Focus.

FUN objectives include serving as a voice to Information Builders, providing a forum for the exchange of technical information among companies and sharing educational information.

Officers elected for 1983 include Alan Atkins of Travelers Insurance Co., president; Timothy Scudder of Cheeseborough Ponds, vice-president; and Maryanne Salamon of Travelers Insurance, secretary/treasurer. Kari Korell of Hartford Insurance Group was chosen program chairwoman for the next FUN meeting, tentatively scheduled for the third quarter.

FUN, which is based in Connecticut, is not the only New England-area group serving Focus users. Korell noted there is also a group based in Boston — The New England Focus Users Group (Nefug) — and suggested the possibility of a future merger of the two groups with two or more area chapters.

Users seeking more information about FUN can reach Korell at Hartford Insurance Group, Hartford Plaza, Hartford, Conn. 06115. Information about Nefug is available from Paul Harris, John Hancock Insurance Co., P.O. Box 111, T56, Boston, Mass. 02117.

'Can't You Find a Quieter Way to Count Sheep?'

Series of Consumer Reports Surveys Hospital DP Gear

GAINESVILLE, Fla. — Medical Systems Research, Inc. recently made available a series of consumer reports on data processing equipment for hospitals, including product analyses of word processors, comparative studies of data processing budgets and statistical analyses of the data base in six separate hospital departments.

The result of a two-year research project at the University of Florida on the hospital data processing industry; the eight volumes of data provide information to hospitals that need detailed reports on available hardware and software, according to Dr. Ralph Grams, a pathology professor and the editor for the publications.

The reports focus on the following hospital departments: finance and accounting, admissions/registration, nursing station/order entry, laboratory, pharmacy and radiology.

Ten additional volumes addressed to the computer industry focus on potential customers in the hospital marketplace, Grams added.

"The volumes for the computer industry explore what kinds of systems and designs are needed and how well the current hardware and software are performing," Grams said.

The volumes for hospitals, "Consumer Reports," cost $300 each. "Market Reports" for the computer industry cost $1,200 each. More information is available from Medical Systems Research, Inc., Suite C-2, 901 N.W. 8th Ave., Gainesville, Fla. 32601.

AIM '82 Polls Data Centers Serving Thrifts

CHICAGO — The Association of Information Managers for Financial Institutions (AIM) has released the 1982 "Thrift Institution Automation Survey." The 300-page survey describes 536 data centers serving thrift institutions nationwide.

The survey includes hardware, software, staffing and applications information about in-house data centers and independent service bureaus that provide on-line deposit and lending services.

Seven cross-references categorize the survey alphabetically, geographically and by number of accounts received. Manufacturers and models of CPUs, automated teller machines and minicomputers are also categorized, a spokesman said.

The survey costs $50 for AIM members and $200 for nonmembers. AIM is a division of Financial Managers Society for Savings Institutions, Inc., 111 E. Wacker Drive, Chicago, Ill. 60601.

Free Ada Guide Explains Techniques

ROCKVILLE, Md. — A six-page guide for Ada applications programmers which reportedly illustrates proven techniques for efficient program structuring in the Department of Defense-sponsored language is available free of charge from Intellimac, Inc. here.

Actual examples show preferred methods for in-house standardization of program syntax. Style rules are said to help enhance program maintainability and decrease software life-cycle costs.

These methods were derived empirically by Intellimac from 100,000 lines of Ada code developed and delivered over a 22-month period.

The free manual can be obtained by writing to Intellimac, Inc., Sixth Floor, 6001 Montrose Road, Rockville, Md. 20852.

BRYCE'S LAWS
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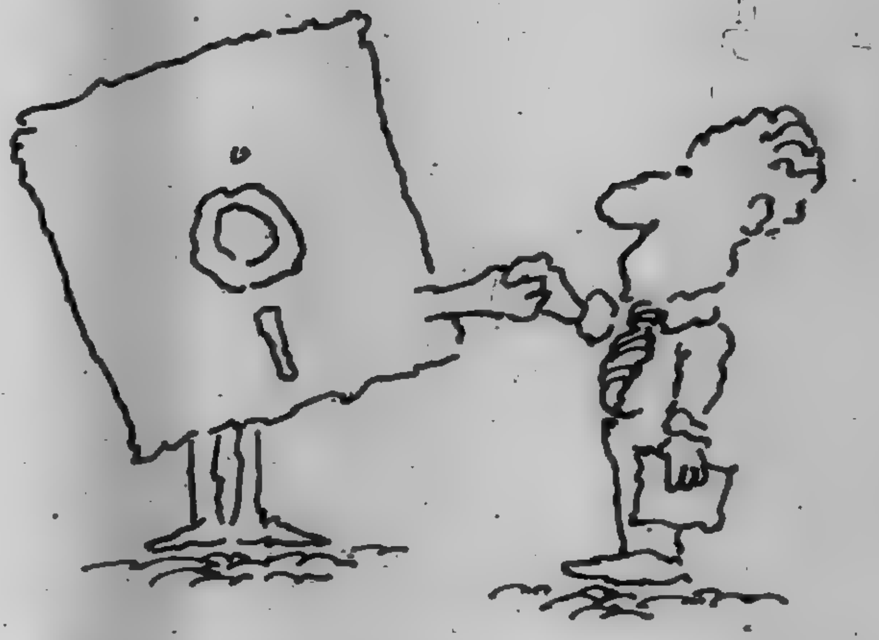

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PARA RESEARCH

Efficient Tracking Method Needed

System Speeds Up Firm's Turnaround of Parts

WICHITA, Kan. — How serious can a company be when some of its leading products are called "Flying Bobs," "Zipper" and "Yo-Yo?"

In the case of Chance Manufacturing Co., the answer is: very serious.

Chance Manufacturing's business is the innovation, production and marketing of amusement rides designed to appeal to those whose idea of a good time is to have the daylights scared out of them at state and county fairs, traveling carnivals and amusement parks.

When Chance's inventory soared in 1972 from 8,000 items to nearly 30,000, Richard Chance, president of the company, decided to switch from the each-part-on-a-card manual system of inventory control to data processing.

"There had to be an efficient way to keep track of all these parts," Chance said. "So we went to data processing through a service bureau, whose control system was based primarily on batch processing. That looked all right in theory."

Frustrating Years

The company then went through "two frustrating years with that approach before we were forced to admit that it wasn't taking care of our needs at all. The problem was that we just weren't getting the turnaround we needed. We wanted to have inventory and job-costing information immediately, not a week later."

Meanwhile, Chance continued, "numerous transactions were taking place within the company. We were in a period of almost unbelievable growth and our inventories were in a state of constant flux. Quite honestly, most of the time we didn't know where we stood."

Eventually, the company called in a local data processing consultant who recommended in-house data processing. After looking at several systems, Chance Manufacturing decided on the 2200 system from Wang Laboratories, Inc. of Lowell, Mass. The Wang system went on-line in the spring of 1976.

"We went with the Wang system because there was no comparable product on the market at the time," Chance added. "The other companies in data processing tended to have software which was essentially batch-oriented; this was too conservative and too old-fashioned for what we wanted to do. We needed to access and act on information immediately.

"Wang proved that its CRT screens could act quickly and correctly on our data base," he continued. "They also had a strong background on the techniques we were using with our new approach to software design."

Sensitive Areas

Steven Jacobson, manager of DP at Chance Manufacturing, joined the company in 1973 to oversee the conversion from batch mode to a full-scale interactive operation. His satisfaction with the Wang system carries over to the occasionally sensitive area of DP service and support, he said.

Jacobson said the Wang system paid for itself in about 18 months. The company had been going through some 30,000 nonamortizable dollars each year to obtain batch processing from the service bureau before the decision was made to spend a flat $50,000 to purchase the Wang system, which is now running about 16 hours per day.

Chance Manufacturing uses the system now to access some 65,000 items of on-line inventory, about 4,000 work orders, records covering some 1,200 customers and 1,500 vendors and payroll records for its nearly 200 employees.

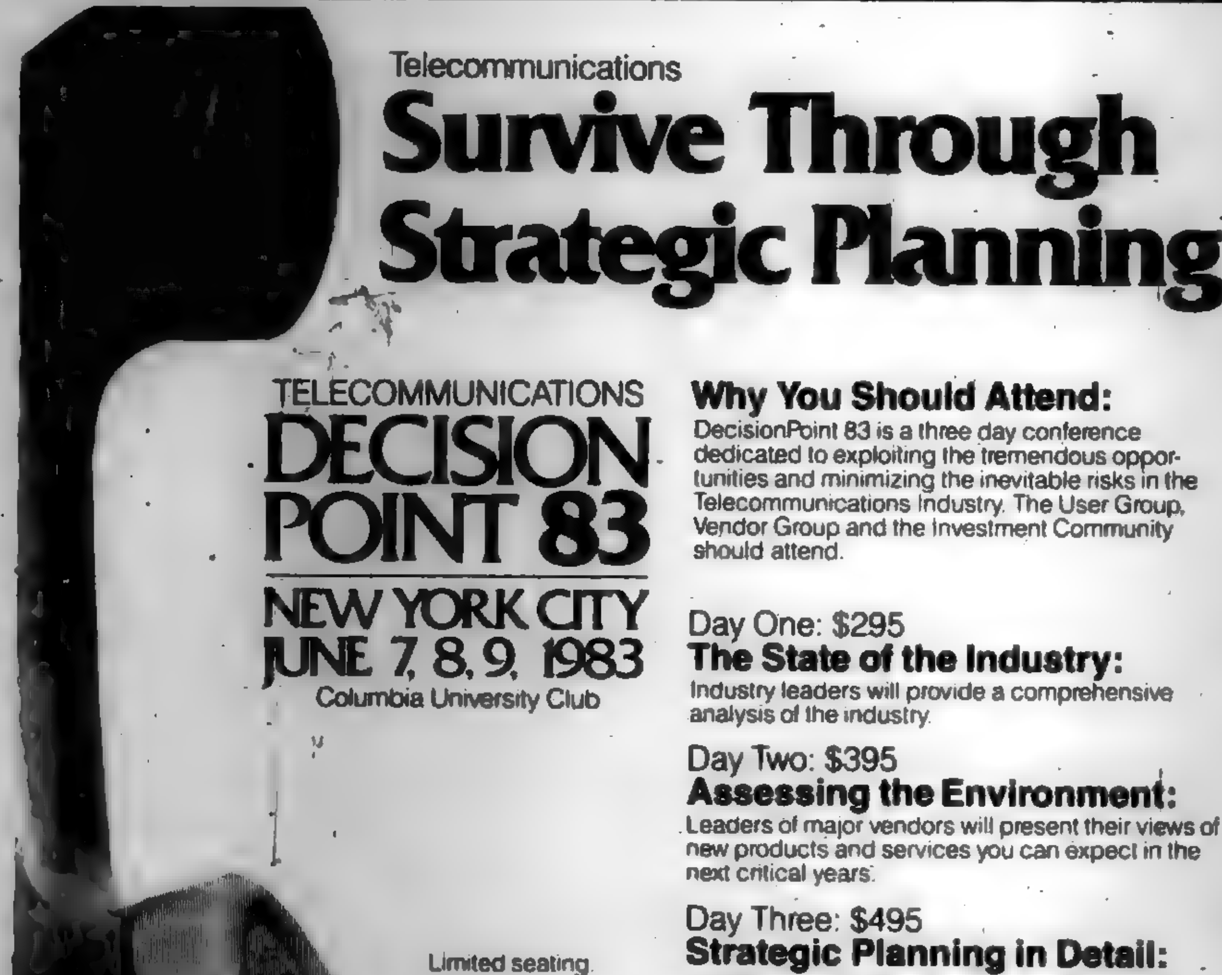
Journal Covers Computer Law

LOS ANGELES — The Center for Computer/Law has announced publication of its third annual "Computer/Law Journal."

The journal contains articles on trade secret and patent protection for computer software, the liability of architects and engineers in the computer age and computer acquisitions, according to a center spokesman.

The trade secret article covers protection in the areas of mass marketing and employment situations, and the patent article analyzes all software-related patent decisions to date. A third article discusses the potential losses from negligence and misuse of computer technology faced by architects and engineers. The last two articles discuss the negotiation and procurement of major computer systems and the issue of vendor fraud, the spokesman said.

The journal can be purchased for $18 ($19 outside North America) through the Center for Computer/Law, Box 54308 T.A., Los Angeles, Calif. 90054.



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System Helps University Solve Growing Memory, Access Needs

EAU CLAIRE, Wis. — Problems at the University of Wisconsin's new computer center are only academic.

That's because the computer center and its new system were designed to serve the needs of a growing population of professors and students seeking access time.

Prior to late 1980, gaining access was no easy task. The computer service needs of both academic and administrative departments were served by a single computing center, according to Michael Yohe, director of academic computing. However, increased demand from academic departments created the need for a center dedicated to the instructional side of the university, complete with greater range, capacity and memory, he added.

To meet this demand, Yohe first had to analyze current and anticipated computing needs and equipment by determining who actually used the equipment and for what purposes. A survey showed that the business school and the computer science department were responsible for more than 85% of the existing system's use.

Also, the survey uncovered other departments that wanted more computer access in general and a text processing capability in particular, which the existing system lacked. Greater time-sharing and memory capacities were needed as well, as the university's needs had outstripped the system's capabilities.

Six Proposals

Yohe solicited and received six proposals for replacement systems. Each was evaluated against technical capabilities, benchmark tests and cost. After the results were tabulated, Honeywell, Inc. emerged as the best choice based on its time-sharing support and adaptability, according to Yohe.

The university purchased a Honeywell DPS 8/20 host computer with 512K bytes of memory, which runs under the Gcos III operating system, to anchor the academic computing center. The center went on-line in July 1980. With the system, Yohe said, time-sharing capacity increased by more than four times the previous level under the old shared system.

The academic computing system is accessed by about 100 CRT terminals at various locations including departmental offices and nine dormitories.

In addition to text processing, statistical analysis, scientific research, computer science and data processing courses, the system provides computer resources to a variety of university curricula.

About 50% of the school's 11,000 students will use the academic computing center during their college careers, nearly 30% during an average semester, John Beck, systems/software manager, said.

Another system plus is its built-in flexibility, Beck said. "The system provides good flexibility for upgrades," he said. "During the next three years, we'll probably have to upgrade our processing capabilities either by adding a second processor or by moving to a new one." So far, the center has had to double the system's memory.

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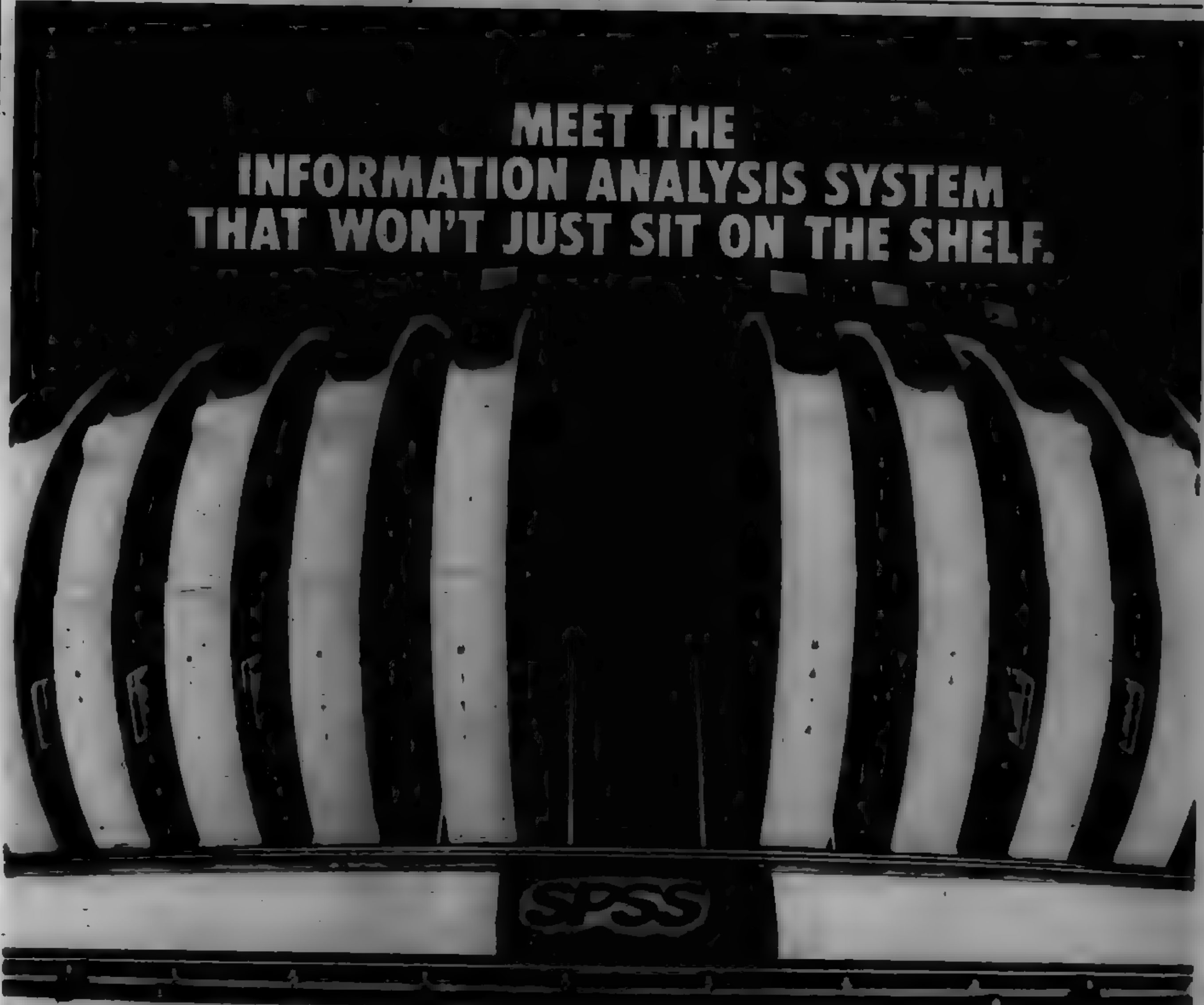
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Financial Tool Helps Publisher Streamline

MINNEAPOLIS — Sutton Industries, a California-based publisher of shoppers' and direct mail advertising materials, has turned to a software consulting firm here for a financial package the company claims has streamlined and improved the efficiency of its operations.

Before purchasing the accounting package for its newly purchased IBM System/38, which replaced a batch-oriented System/3, Sutton officials put together a list of requirements they wanted the software package to meet.

A partial list of those requirements included flexible report generation, on-line data entry, incorporation of multiple companies with multiple divisions into the general ledger system and, perhaps most importantly, data base management capabilities.

However, once they began their software search, Sutton officials began to realize the System/38-compatible packages available did not make use of the system's on-line, data base capabilities.

"In fact, we found that even IBM's own System/38 software didn't use all of the [system's] on-line data base management concepts," said Tony Distefano, accounting manager for Sutton.

After carefully examining all the contenders, Distefano said his firm decided to go with Lawson Associates' financial packages because they were developed specifically for the System/38 and, unlike most other packages the company was considering, did not have to be rewritten. The financial package includes programs for general ledger, accounts payable, payroll and fixed assets.

With the new hardware/software package, Distefano said his company's management team is receiving many more reports than it did using its old System/3. The company felt the System/3 had "limited report generation capabilities."

"We chose their software because Lawson has a good reputation with other users. We checked with several companies using the System/38 packages and found that they were pleased with the software and capabilities," Distefano explained.

While Sutton was in the process of examining the financial packages of several vendors, the company considered developing its own software. But when it found out how expensive it would be in terms of investing time and personnel, the company decided against it.

"We figured that it would take our entire 12-person data processing staff more than a year to develop the system in-house, not including the time needed to maintain our daily data processing operations," Lawson said. He felt his staff could better spend its time developing a "unique production system."

As the software began to streamline the company's business, Distefano said the new level of efficiency has brought about some unforeseen advantages. According to Distefano, the package has helped to reduce, by two to three days, the time to do month-end closings. Before, such information on the preceding month was not available until the middle of the following month.

The fact that Sutton and Lawson are almost 2,000 miles apart has not caused a communication problem, Distefano said. "Lawson's people have been out here six or seven times since we bought the software. And when we have called their support staff with questions or problems, they have been extremely responsive and helped us sort out problems quickly," he noted.

Series Targets Cullinet's IDMS

NAPERVILLE, Ill. — A multimedia training series for users of Cullinet Software, Inc.'s IDMS data base management system is available from Deltak, Inc. and DBMS, Inc.

The first subseries, "IDMS: Logical Data Base Design," considers logical design skills and is geared toward systems analysts, program designers and data base administrators.

The subseries includes the following courses: "Identifying Data," "Normalizing Data Structures" and "Finalizing Logical Design." The subseries is available for purchase or rental through Deltak's flexible Deltavision Library Plan.

Courses are available for an average rental of $50 to $125 per course, per month, depending on volume. Deltak is located at 1751 W. Diehl Road, Naperville, Ill. 60566.

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In this series of ads, we're focusing on some of the many customers who are being served by our reliable, proven Videodata® technology. For more information, including a free 16-page brochure titled "How to Choose a Local-Area Network," phone 800-328-1684 toll-free. (In Minnesota, 800-792-1072.) Or fill in and mail the accompanying coupon.

Case History #127

Appalachian State University

Appalachian State University is a school of 10,000 students in Boone, North Carolina. Until recently, its mountainous setting made good television almost impossible. This meant that instructors and students were denied access to concerts, plays, and other educationally useful programming on public television.

University administrators decided in 1979 that the time had come to do something about the problem. After a careful study, they invested in an Interactive Systems/3M Videodata® broadband network. Today, the university is benefiting from a system that combines the proven concept of cable television with high-density, two-way communications for such purposes as digital information, voice, and energy management as well as commercial and public TV, campus-originated programming, and training materials on film or videotape.

The IS/3M Videodata network incorporates more than 17 miles of ½-inch coaxial cable. A dual-trunk configuration was chosen to provide enough bandwidth for an unusually large number of future television channels. (Normally, one main cable would suffice for all types of communications, since frequency- and time-division multiplexing allow simultaneous two-way communications by thousands of devices. Appalachian State wanted the extra capacity because 35 TV channels

Captures Data From 21 Locations

POS Net Speeds Checkout for Resort's Guests

AMELIA ISLAND, Fla. — The last thing business travelers need at the end of a trip is a long wait at the hotel desk to settle their accounts.

Amelia Island Plantation, a 900-acre resort 29 miles northeast of Jacksonville, Fla., is trying to avoid this problem by using a network of terminals to capture transaction data from 21 scattered locations and post the charges to guest folios.

The system here also handles food and revenue accounting and gives a continuing analysis of how well each location of the resort is operating, according to the plantation's senior vice-president, Jack B. Healan Jr.

In selecting the resort's network, Healan evaluated 10 systems and decided that a processor-driven, point-of-sale (POS) terminal system best met his organization's needs. "I decided on a system design from the user's point of view," he explained. "I believe the result efficiently covers all the bases to run the business."

Operational System

The system was operational at Amelia Island Plantation by last June. NCR Corp. Model 2160 POS terminals communicate with the IBM mainframe that handles reservations and general accounting. IBM and NCR programmers worked to link the respective systems, and the interface program was put into operation within 12 hours and operated successfully.

A notable feature of the completed system is a cable hookup of the four central CPUs in the main office with the 21 terminals that are spread out over the 900-acre resort.

Healan explained that the four cable-runs to the four CPUs had to be buried to preserve the natural appearance of the resort: One branch even extends under highway A1A to the golf pro shop, and another extends 4,700 feet to the tennis center. A special, direct-burial cable was used. This continuously operating cable hookup is intended to save on monthly telephone charges.

Healan said the response time of this system is as rapid as if the CPU were directly beside each terminal. For example, as the order is entered by the waiter into the terminal at the restaurant counter, an automatic forms number reader electronically reads the number code printed on the guest check, and the order initiation is registered in the CPU at the front desk. The order also is reproduced on a printer in the kitchen and the cook refers to this printed record when preparing the order. When the guest settles his check, that check is posted immediately and automatically to the guest account at the front desk.

Self-Balancing System

Healan observed that the system saves time because the automatic forms number reader designed into it controls guest checks and makes the system self-balancing. It does the posting of guest checks without keystrokes and tells which tickets have not been settled and which checks the waitress is still accountable for. It also keeps time and attendance data on employees, as well as menu abstract and inventory accounting.

"We almost get a daily profit-and-loss statement on each restaurant," Healan added.

Healan estimated that the posting function alone saves 3½ people on the front desk operation. The system also allows inquiries on the current status of a guest account, without codes, with the use of a simple name identification.

"That's very important for waiters and waitresses. Their purpose is to serve guests, not answer a lot of computer questions," Healan said.

At the centrally located CPUs, a rotary switch allows the night auditor to monitor any one of the 21 POS locations in turn, reducing the time needed to balance the books at the end of the day.

While the system is presently functioning well, it did have problems when first installed. Most of these problems were blamed on the staff, who had to learn how to operate the system, Healan explained.

Iassist Conference Set for May 19-22

PHILADELPHIA — The International Association of Social Science Information Service and Technology (Iassist) will hold its annual conference here May 19-22.

Conference workshops will focus on microcomputer software systems for time series data, accessing large and complex data files and planning or integrating a data center in selected working environments.

A panel will discuss "Development of an Information Network for Locating and Describing Available Data and Programs."

Registration cost is $70 for Iassist members and $90 for nonmembers. More information is available through Iassist 83, c/o Gert Lewis, Rutgers University, CCIS Hill Center, Box 879, Piscataway, N.J. 08859.

This diagram shows the existing campus-wide Videodata network at Appalachian State University. (For simplicity, the two parallel coaxial cable trunks are represented by a single line.) Proposed network extensions are also indicated, as are current and future junction points for branch cables that serve buildings or campus areas.

Richard Arnold, associate vice chancellor for business affairs, worked with university departments and IS/3M in planning Appalachian State's Videodata network.

Remote CRT terminals can be plugged into the Videodata network wherever a connection point exists. No rewiring is needed.

are already being used, and full-motion video requires far more bandwidth than other types of signals.)

The two cable trunks, which total 90,000 feet in length, run side by side and share ducts with the university's telephone and power networks. Access to cable taps and amplifiers is through manholes. Parallel branch cables run from the main network into buildings, where they terminate in cable jacks at convenient points for plug-in installation of modems and/or multiplexers for use with television sets, CRT terminals, and other devices.

Although the need for distributing video signals was a major reason for the network's installation, data communications are equally important. The school uses a large Univac 90/80 computer for administration and management DP as well as instructional use by the physics, mathematics, business education, history, political science and computer science departments. On-line terminals serve functions such as registration, accounting, student records, parking, and traffic control.

"We have nearly 150 remote CRT terminals in buildings outside our computer center," says Ernest L. Jones, director of computer and management service. "Most of them have been operating over leased telephone lines. With the coax system, we'll be able to serve these users more efficiently, with faster communications speeds and far faster installation time than we can get with our telephone connections." Jones adds that departmental mini- and microcomputers may also be linked to the mainframe via the IS/3M network in the near future.

The Videodata network currently offers 35 television channels for distribution of campus-produced programming as well as commercial and public TV.

Associate vice-chancellor Richard Arnold reports that the university is pleased with the network's performance to date. "Our broadband network is very straightforward and mechanically simple," he notes. "Its simplicity is especially remarkable when one considers its huge capacity. We're only beginning to learn how the Videodata network can increase efficiency and improve communications for both administrative and academic users. We're confident that broadband communications will serve our needs economically for many years to come."

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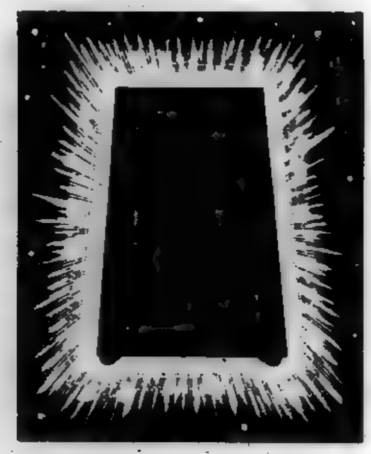

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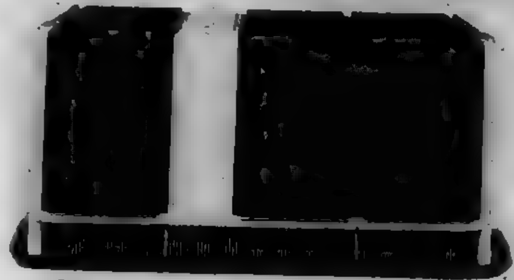

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Data General

*Sources include trade press articles, Digital literature, industry reporting publications and data supplied by industry reporting services.

Calendar

Week of March 27

March 28-29, New York — **DP for Key Users.** Contact: Ed Green, Executive Education Center, Peat, Marwick, Mitchell & Co., 810 Seventh Ave., New York, N.Y. 10019.

Week of April 10

April 10-13, Boston — **Computer-Based Training Conference.** Contact: Data Training, 176 Federal St., Boston, Mass. 02110.

April 11-13, Dallas — **SNA Architecture and Implementation.** Contact: Communications Solutions, Inc., 992 Saratoga-Sunnyvale Road, San Jose, Calif. 95129.

April 11-14, Philadelphia — **National Micrographics Association (NMA) 32nd Annual Conference & Exposition.** Contact: NMA, c/o First American Bank N.A., 740 15th St. N.W., Washington, D.C. 20005.

April 11-15, Washington, D.C. — **IMS/VS Data Base Design.** Contact: Data Base Management, Inc., 1075 Tolland Tnpk., Manchester, Conn. 06040.

April 11-15, Hartford, Conn. — **CICS Command Level Programming Language.** Contact: New England Data Services, P.O. Box 92, Guilford, Conn. 06437.

April 11-15, Washington, D.C. — **Systems Analysis & Design Workshop.** Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

April 11-22, Hartford, Conn. — **MVS System Fundamentals.** Contact: Amdahl Education Center, M/S 302, 1250 E. Arques Ave., Sunnyvale, Calif. 94086.

April 12-13, New York — **Executives in the Emerging Information Envifonment.** Contact: Conference Registrar, The Conference Board, 845 Third Ave., New York, N.Y. 10022.

April 12-13, Danvers, Mass. — **The New Technologies: Impacts on People.** Contact: Thomas Chase, The Organizational Development Network, 15 Garrison Ave., Durham, N.H. 03824.

April 12-13, Dayton, Ohio — **7th Annual Computer Fair.** Contact: Dan Schumacher, University of Dayton, 300 College Park Ave., Dayton, Ohio 45469.

April 12-14, Seattle — **Data Base Concepts and Systems.** Contact: QED Information Sciences, Inc., QED Plaza, P.O. Box 181, Wellesley, Mass. 02181.

April 12-14, Atlanta — **Data Communications Network Design & Optimization.** Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

April 12-14, Oklahoma City, Okla. — **Southwest Computer Conference.** Contact: Southwest Computer Conference, P.O. Box 950, Norman, Okla. 73070.

April 12-14, San Diego — **Data Processing for Telecommunications.** Contact: DP Telecommunications Institute, University Extension X-001, University of California, San Diego, La Jolla, Calif. 92093.

April 12-15, Santa Clara, Calif. — **IMS/VS Installation Workshop.** Contact: Amdahl Education Center, M/S 302, 1250 E. Arques Ave., Sunnyvale, Calif. 94086.

April 12-15, Washington, D.C. — **Packet Switching for Modern Data Communications.** Contact: Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

April 13-14, New York — **CICS and Vsam Technical Seminar.** Contact: Candle Corp., Suite 2404, 10880 Wilshire Blvd., Los Angeles, Calif. 90024.

April 14-15, Boston — **Artificial Intelligence.** Contact: Data Processing Management Association Conferences, Department A1, P.O. Box 3608, Torrance, Calif. 90510.

April 14-15, Andover, Mass. — **Computer Operations Management.** Contact: University of Lowell, Continuing Education, 1 University Ave., Lowell, Mass. 01854.

April 14-17, New York — **New York Computer Show & Software Exposition.** Contact: Northeast Expositions, 822 Boylston St., Chestnut Hill, Mass. 02167.

April 15-17, Anaheim, Calif. — **Applefest/Anaheim.** Contact: Northeast Expositions, 822 Boylston St., Chestnut Hill, Mass. 02167.

Week of April 17

April 18-19, Washington, D.C. — **Word Processing VII.** Contact: National Institute for Management Research, Department B, P.O. Box 3727, Santa Monica, Calif. 90403.

April 18-19, San Francisco — **Computer Crime.** Contact: Law & Business, Inc., Harcourt Brace Jovanovich, Inc., Publishers, 757 Third Ave., New York, N.Y. 10017.

April 18-19, Los Angeles — **Software Engineering Economics.** Contact: Data Processing Management Association, Education Foundation, Department SEE, P.O. Box 3608, Torrance, Calif. 90510.

April 18-19, Washington, D.C. — **How to Manage Data and Information as a Resource.** Contact: Barnett Data Systems, Inc., 19 Orchard Way N., Rockville, Md. 10654.

April 18-20, Summit, N.J. — **IMS Data Base Access DL/1.** Contact: Chubb Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

April 18-20, Columbus, Ohio — **DOS/VSE Performance Measurement and Tuning.** Contact: Goal Sys-

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April 18-20, Los Angeles — **X.25 and Other Protocols for Long-Haul and Local-Area Networks.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

April 18-20, Washington, D.C. — **SNA.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

April 18-20, Washington, D.C. — **DP Disaster Recovery Seminar.** Contact: EDP Security, 181 West St., Waltham, Mass. 02154.

April 18-21, Boulder, Colo. — **Vsam Programming and Structures.** Contact: The Seminar Broker, 3212 W. 133 Ave., Broomfield, Colo. 80020.

April 18-21, New Orleans — **1983 International Conference on Computer Capacity Management.** Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

April 18-21, New York — **Vsam Structure and Programming.** Contact: Telecommunications Technology Corp., 548 Fifth Ave., New York, N.Y. 10036.

April 18-22, Washington, D.C. — **C Programming: A Hands-On Workshop.** Contact: Donald D. French, Institute for Advanced Professional Studies, 55 Wheeler St., Cambridge, Mass. 02138.

April 18-22, Washington, D.C. — **Advances in Electronics Technology II.** Contact: Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

April 18-22, Chicago — **Data Base Concepts and Design.** Contact: American Management Association, 135 W. 50th St., New York, N.Y. 10020.

April 18-22, New York — **Vsam.** Contact: Sysed, 1 Park Ave., New York, N.Y. 10016.

April 18-22, Las Vegas — **Auditing in the Contemporary Computer Environment.** Contact: Marge Umlor, EDP Auditors Foundation, 373 S. Schmale Road, Carol Stream, Ill. 60187.

April 18-22, Las Vegas — **Auditing Integrity Controls in the Contemporary Computer Environment.** Contact: Marge Umlor, EDP Auditors Foundation, 373 S. Schmale Road, Carol Stream, Ill. 60187.

April 18-22, Sacramento, Calif. — **Structured Systems Design/Structured Program Design.** Contact: Gayle Giescke, Ken Orr and Associates, Inc., 1725 Gage Blvd., Topeka, Kan. 66604.

April 18-29, Santa Clara, Calif. — **MVS Structure and Flow.** Contact: Amdahl Education Center, M/S 302, 1250 E. Arques Ave., Sunnyvale, Calif. 94086.

April 19-21, Washington, D.C. — **Local-Area Networks.** Contact: Technology Concepts, Inc., 730 Boston Post Road, Sudbury, Mass. 01776.

April 19-21, New York — **Electro '83.** Contact: Electro, P.O. Box 92275, Los Angeles, Calif. 90009.

April 19-22, Washington, D.C. — **Introduction to Adabas/Programming With Natural.** Contact: Registrar, Applied Technology Associates, Inc., Suite 1418, 1710 Goodridge Drive, McLean, Va. 22102.

April 19-22, Washington, D.C. — **Hands-On Unix Workshop.** Contact: Ruth Dordick, Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

April 20-21, New York — **Integrating PBXs and Office Systems.** Contact: Probe Research, Inc., P.O. Box 590, Morristown, N.J. 07960.

April 20-21, New York — **How to Program Computers in Basic.** Contact: Executive Enterprises, Inc., 33 W. 60th St., New York, N.Y. 10023.

April 20-22, Washington, D.C. — **How to Build and Use a Data and Information Resource Directory.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

April 20-22, Houston — **Teleprocessing Fundamentals.** Contact: Amdahl Education Center, M/S 302, 1250 E. Arques Ave., Sunnyvale, Calif. 94066.

April 20-22, Chicago — **Financial Information Systems — The New Generation.** Contact: National Institute for Management Research Seminars, Department PR, P.O. Box 3727, Santa Monica, Calif. 90403.

April 20-22, Houston — **Performance Analysis and Capacity Planning Concepts and Tools for VAX/VMS Systems Seminar.** Contact: Raxco, Inc., Suite 200, 6520 Powers Ferry Road, Atlanta, Ga. 30339.

April 20-22, Hampton, Va. — **Symposium on Computer-Aided Geometry Modeling.** Contact: John Shoosmith, Mail Stop 125, National Aeronautics and Space Administration Langley Research Center, Hampton, Va. 23665.

April 20-23, Chicago — **Future/Interact Convention.** Contact: Management Science America, Inc., Suite 1300, 3445 Peachtree Road N.E., Atlanta, Ga. 30326.

April 21, Columbus, Ohio — **DOS/VSE Shared Direct Access Storage Device.** Contact: Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

April 21, San Francisco — **Computer Law for the Purchaser.** Contact: Business and Management, Department 468NB, University of California Extension, 2223 Fulton St., Berkeley, Calif. 94720.

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EDITORIAL

An Uneasy Silence

The electronics industry has mounted a phenomenally successful lobbying blitzkrieg to persuade the White House and Congress that this country's high-technology superiority is slipping away under concerted attack from Japan and Western Europe. The recent Commerce Department report to the White House supported the complaints of U.S. high-tech firms about their declining competitiveness in domestic and international markets [CW, March 21].

Unfortunately, the industry has failed to offer an agenda for countering this high-tech challenge. For example, the Semiconductor Industry Association (SIA), currently the most vocal of industry groups petitioning the government, recently issued a detailed account of the effect on U.S. chip makers of Japanese government actions to protect and support — in SIA's estimation, unfairly and, in some cases, illegally — its native semiconductor industry [CW, Feb. 14]. But the association declined to suggest how the government should respond.

Perhaps the industry is silent because, like the government, it does not know what to do. There have been suggestions aplenty — antitrust immunity in joint research and development ventures, favorable stock option plans, extension of R&D tax credits, streamlined export license processing — but not for anything that would match the crisis the industry says it faces in trying to compete with Japan.

Or perhaps the industry is silent because it senses, correctly, that the mood in Congress is not completely one of sympathy. For instance, the industry must realize that in the Democrat-controlled House, the thinking of Speaker Thomas P. O'Neill (D-Mass.) and his ideological fellow travelers is that when it comes to handing out government assistance to hard-pressed industries, the electronics sector will have to stand in line behind autos, textiles and steel.

More likely, however, the electronics industry is silent because it fears government assistance will mean increased government interference. Historically, that assistance has all too frequently come out looking distressingly similar to regulation — the last thing a growing, generally healthy industry wants.

The time is right for making some hard decisions in corporate boardrooms and government agencies. The vision of a high-tech future has already been tarnished by the realization that it will be years — if ever — before high-tech companies can create more jobs than their products and services displace.

If the competitive crisis is as great as the industry maintains, there is no time to waste. A resurgent economy worldwide could obviate the need for any government action, but who can count on that? In any case, the industry must realize it now has the attention of the government to an almost unprecedented extent. But in the fast moving world of politics and economic developments, the attention span is notoriously short.

'Come on, hit me —I dare ya!'

LETTERS

Meeting Halfway

Thomas M. Nies, president of Cincom Systems, Inc., predicts the extinction of the programmer in the article "Programmer Extinction Predicted" [CW, Feb. 14]. The same prediction has been made many times in the past, and programmer extinction has not yet occurred. On the contrary, the programmer will not become extinct now or in the foreseeable future.

Yes, most shops have a large backlog of work and many users are dissatisfied with their systems. But what are the fundamental causes of these problems?

Most automated systems are simply computerized versions of the manual systems they replaced. The human brain is a remarkably flexible instrument and can deal fairly well with incomplete instructions.

Computers, on the other hand, require complete and explicit directions that are quite often lacking in manual systems.

The delays in many projects are a result of the added complexity introduced when conditions are discovered that were either not addressed in the manual system or were being handled incorrectly.

How many times have you had this experience during the development of a system: A user department manager, upon hearing what his own people have been doing, says "What? They're doing that? That isn't right!"

Many departmental operations are simply a collection of ad hoc procedures that lack any systematic continuity.

But try suggesting to a user that the system would be simpler, easier to use and more accurate if some of the procedures in the user's department were revised. You might as well clean out your desk and update your resume, because you will be persona non grata from then on.

The sanctity and accuracy of manual systems are facades that are revealed when one attempts to computerize the systems. As a consequence, data processing is stuck with overly complex, difficult-to-maintain systems that mirror the lack of efficiency in the user departments.

The true value of a good programmer lies in his ability to approach a problem logically, methodically and thoroughly.

This ability is not something that everyone has, and transferring the programming task to the user departments will soon make that abundantly clear. However, the price of that lesson will be incredibly high.

Rather than attempting to eliminate the data processing department, the users should make use of these people's abilities to streamline their operations, with an eye toward more extensive and effective computerization.

The DP staff, on the other hand, must stop intimidating the users with buzzwords and technological mysticism and learn more about the applications environments with which they must deal.

By meeting each other halfway, we can make all our jobs easier, more satisfying individually and more productive for our organizations.

Gordon S. Glasgow
Kirkland, Wash.

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. Letters may be edited for purposes of brevity and clarity. Letters should be addressed to Editor, *Computerworld*, 375 Cochituate Road, P.O. Box 880, Framingham, Mass. 01701.

DATA PAST

Five Years Ago
March 27, 1978

WHITE PLAINS, N.Y. — IBM shipped the first models of its 30 series processor a full two weeks before its own deadline for first shipments. The Singer Co. of Wayne, N.J., received the first 3033.

Ten Years Ago
March 28, 1973

WASHINGTON, D.C. — Western Union Telegraph Co. proposed new rates for its planned domestic satellite system. The domestic satellite system could cut user rates by more than 50%.

SOFTLINE/Werner L. Frank‡

Australia: A Test Market for Japanese Micros

JB3000 (In Australia)		
Two Diskettes	Video	
	Monochrome	Color
5¼ in.	$5,578	$6,780
8 in.	$7,436	$8,551

Price of Panasonic Co.'s Personal Computer

Australia has been described as a test market for Japanese export-directed hardware and software. A recent visit down under gave me the opportunity to investigate this phenomenon.

My attention was attracted by a full-page advertisement appearing in the Australian general press, promoting the availability of the Panasonic Co. JB3000 Personal Computer. Along with other claims, six points were emphasized:

- Sixteen-bit technology with memory expandable to 256K bytes.
- External storage, including either 5¼-in. or 8-in. diskettes.
- Eight-color, high-resolution graphics.
- Software compatibility with the IBM Personal Computer.
- Availability of general introductory training courses, including support of locally produced accounting packages.
- Distribution by leading retailers.

Well-Planned Introduction

It appears that this introduction from Panasonic was well and purposefully planned. The last two points are especially worth noting since they are not usually included in U.S.-based promotions. Five accounting application modules are offered, ranging in price from the Invoicing Sales Analysis package at $418 to Accounts Receivable, Inventory Control, General Ledger and Accounts Payable at $790 each. All six modules can be obtained for $3,100, a 15% savings. The source of the software is a local Australian supplier, Attache Software Pty. Ltd.

A notable point of departure from American practice is the arrangement made with Australia's leading business colleges to provide a full range of training courses in support of this software, as well as an introduction to personal computing.

The education works like this: When purchasing a system, the buyer receives vouchers good for 7½ hours of training at selected institutions. Additional vouchers can be purchased at $25/hour. This is an intelligent way to achieve a satisfied clientele.

Extraordinary Sales Technique

Another extraordinary sales technique is the deployment of retail outlets for the marketing distribution scheme. Identified in the ad were two prominent merchants — a department store enterprise and Australia's largest chain of conventional bookstores — attracting walk-in business.

The bookstore chain has introduced the new concept of the Business Center, an area in the store that is set aside to cater to businessmen, where the JB3000 is called a "personal business computer" rather than the more conventional "personal computer."

Intrigued, I strode off to view firsthand what is likely to be in store for us in the U.S. I chose one of the bookstore outlets and arrived unannounced and unidentified. My experience was a repetition of earlier ones in Los Angeles when computer stores first began operations there.

First of all, the computer system on display was running a noninterruptible canned demonstration showing off, of course, the colored graphics. The system and application were not yet operable by the sales staff. The store was only able to provide a single, four-page leaflet with system highlights. The manuals and reference material, the salesman said, would be forthcoming.

The clerk, a recent computer science graduate with no micro experience, was extremely courteous. I was never asked to identify myself, nor questioned about my needs or objectives in visiting the store. I was clearly a few months too early in pursuit of any operational experience, documentation or technical details.

Left Something to Be Desired

It was possible to view the hardware and see the color graphics in action. The overall packaging left something to be desired. Aesthetically, it does not compare with systems that were introduced into the American market during the past two years, although the sales pitch stresses the low-profile keyboard and the introduction of green-colored keys. Eight function keys are available for upper-shift and lower-shift operation, as well as 18 dedicated keys for purposes of cursor control, local edit and control.

The promotional literature actually pictured the slightly different Japanese keyboard rather than the keyboard offered for western communities. In fact, on display at the Business Center was one such Japanese keyboard, Kanji characters included, marked by the label My Brain 3000, the name by which the system is known and sold within Japan.

Placement of the function keys along the top of the keyboard is an improvement over the comparable IBM device since it affords space for the placement of a labeling strip. However, connecting the separated keyboard coiled cable to the back of the logic unit replicates a poor design.

The packaging is also affected adversely by the treatment of diskette drives. These are housed separately, probably because both 5¼-in. and 8-in. units are mixable options, and this creates a more cluttered look. The 5¼-in. diskettes have a capacity of 160K bytes, which will soon be increased to 320K bytes and then to 640K bytes. The 8-in. system is already at full capacity, counting 1.2M bytes per drive.

The CPU is Intel Corp.'s 8088, operating at 4.77 MHz. Standard memory consists of 16K bytes of read-only memory used for the Bios and 128K bytes of random-access memory expandable by another 128K bytes. However, 32K bytes of the base memory are dedicated to handling the video display so that users only have from 96K bytes to a maximum of 224K bytes for their applications.

At first glance, one would conclude that there is a deficiency in the limited three on-board slots. Fortu-

(Continued on Page 59)

HUMAN CONNECTION/Jack Stone‡

Not All DP Resisters Are Cyberphobiacs

This is the third article in a series, "DPers and the Psycho-Computer Syndrome," coauthored with Joanne Barker.

Harold and Elizabeth Guarnieri's article, "The Psycho-Computer Syndrome" in *Computerworld Extra!*, Nov. 17, 1982, correctly states that "many capable and intelligent workers are resisting easy-to-use systems." But the article leaves the reader with the wrong impression that such resistance is based solely on cyberphobia, the fear of computers.

No doubt there are plenty of fears in the new user camps. Most office personnel in both supervisory and employee capacities exhibit a whole slew of concerns and apprehensions when facing the prospect of their first computer terminals or, as the article states, "fear them on an emotional basis."

But the bulk of their fears is derived from rational, short-range anxieties that would be expected from perfectly normal people who are about to face a totally new business environment — one filled with the potential for opportunity and growth, as well as personal and professional challenges.

Such fears do not lead to the situation that is reported in Case Study 2 of the article, a rare situation in which a user was so upset about a new terminal that she vomited all over it.

Limited Population

This is not to deny the presence of a small number of true cyberphobiacs whose responses are irrational and who suffer intolerable pressures when they hear "the machines are coming." On the other hand, one should not forget another limited population that, in spite of having no computer experience whatsoever, greets new terminals with enthusiasm and joy.

We can apply the same logic used in the article to the case of computer center personnel who find themselves developing a system for a particularly primordial set of new users.

Often DPers in this predicament are not immune to psychological pressures, ranging from the superficial to the severe, which derive from:

- Grave doubts that terminal operators have the intellect to assimilate even the most elementary keyboard functions.
- A wrenching pessimism that systems acceptance will never take place.
- Dark and lurid thoughts about how management will unfairly blame yet another systems failure on the data processing department.

'Psycho-Human Syndrome'

Next, perhaps, I should ask these questions: "Should such DPers be classified as 'anthropophobiacs?' " "Would we expect them to vent their hostilities by garroting managers of the user department?" "Can we organize DP reactions in such cases into a set of Psycho-Human Syndrome stages, which can be readily identified by the users and employed to improve DP/user relations?"

The authors are on the mark when they state that each staff member reacts to a pending installation according to what he perceives he is getting or losing in the deal.

But the authors skirt the legitimate concerns of user personnel on the quality of the systems and follow-on systems support when they note "How quickly [a staff member] passes through each stage [of the Psycho-Computer Syndrome] . . . also depends upon the reliability and complexity of the system he is learning to use."

If a system and/or its associated support does not fill the bill with respect to reliability and/or other key technical specs, the problem does not have to do with the psychology underlying systems acceptance by new users. Rather, it has to do with the quality of the technical work by the DPers and the effectiveness of their communications in keeping users abreast of developmental progress.

Letters to Stone should be addressed to him at Box 270, 1377 K St. N.W., Washington, D.C. 20005.

GETTING AHEAD IN DP

Presentation Preparation Builds Confidence;

Stage fright is not confined to actors. When we must make presentations to groups of people, many of us find that our palms begin to sweat, our hearts begin to pound and the room suddenly seems very warm.

The most effective way to keep yourself cool and confident is to prepare your presentation thoroughly.

The first question to ask when preparing a presentation is: "What's the purpose?" Is it strictly for purposes of providing information, such as a briefing, or will you be trying to convince someone to change an attitude, trying to sell an idea or position or trying to get a commitment to action? The latter types of presentations are more complicated than the informative presentation, so we will concentrate on them.

Audience Reaction

Before organizing any presentation, you must know what it is you want your audience to think and to do when you have finished.

The second step is to know your subject. You should anticipate all questions by knowing both the pros and cons of your subject.

You must be able to show the benefits of your proposal and its cost-effectiveness. If you are unable to answer sticky questions or if you cannot support your ideas with hard facts and figures, you will lose credibility, the audience will lose faith in your judgment and your proposal will probably go down the tubes.

Know Your Audience

The third most important step is to analyze your audience. The content of your presentation, the angle from which you make it, the style of your delivery and the kinds of audiovisuals you use all depend partly on who will be listening. Know the answers to these questions about your audience:

- How many people will be there?
- What is the age range?
- What is the male/female ratio?
- What are their backgrounds?
- Do they have any expectations or biases about DP that must be considered?
- Is company politics involved?

Chose anecdotes and examples that will not offend your audience's sex, intelligence or attitudes.

Set the time of your presentation carefully. Do not pick a bad time of day, such as late afternoon or the end of a long meeting. At these times, people might be too tired or restless to listen to you.

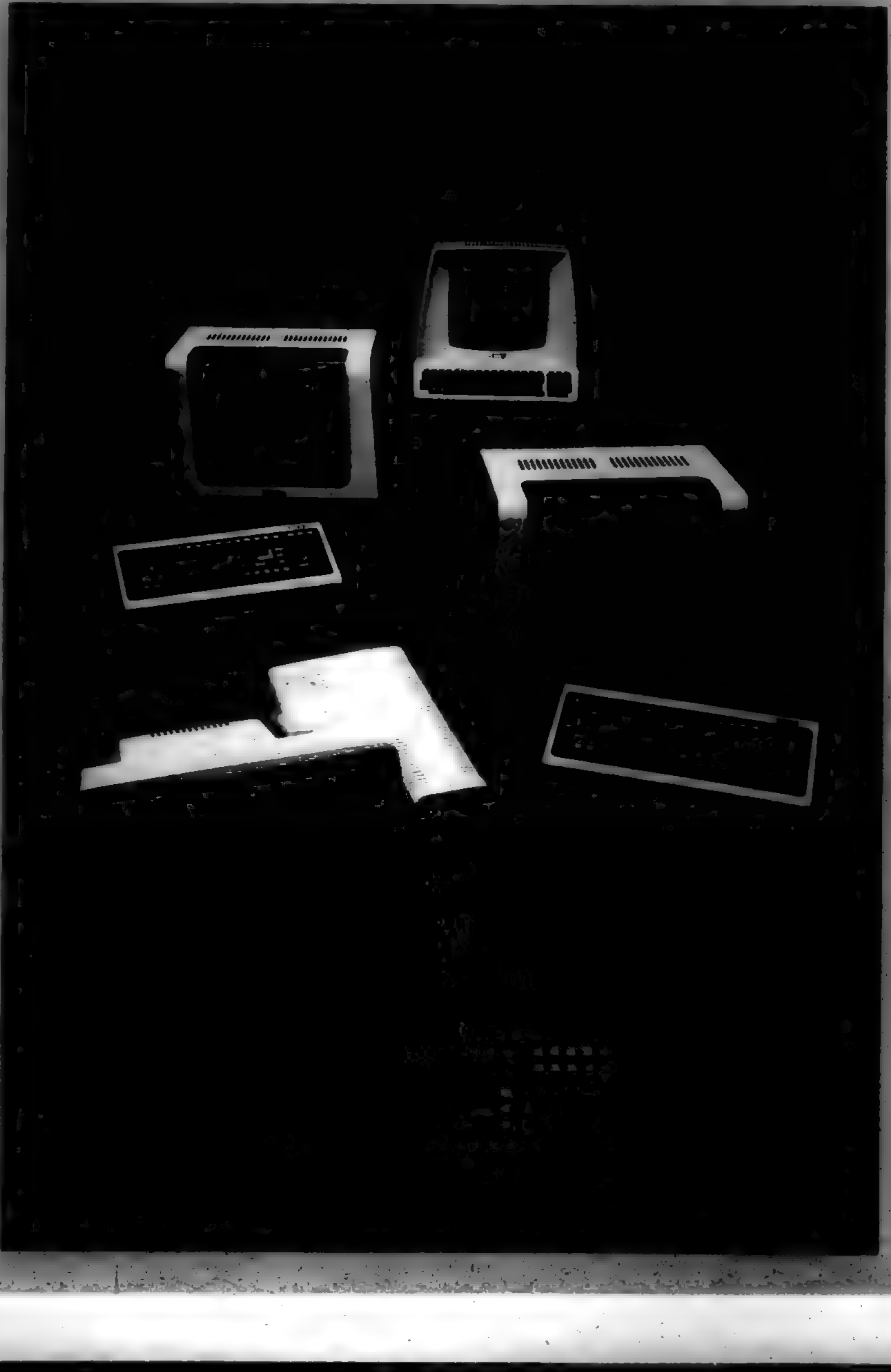
You should also choose the most convenient time for the most important people in your audience, the people who will make or break your proposal.

Visual Aids

Your choice of visual aids should complement the material you are presenting. It is a proven fact that the combination of images and words makes points more vivid and memorable.

Decide which media puts your message in the strongest light. You will probably want to choose from among handouts, charts, slides and videotapes. Each has its advantages.

If you use charts, be sure



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Donald J. Berardo

Know Your Subject, Audience and Practice

they are visible to everyone and easily manageable. If you use slides or videotapes, you will have to check their clarity, as well as the projector and screen you will be using.

Remember, these are aids, but they will stick out like sore thumbs if they are not smoothly and effectively integrated into your presentation.

Check Presentation Site

Next, check out the site of your presentation. What is the lighting like? Is there a lectern? Is there a sound system (if necessary)? Decide on a seating arrangement. If the seating arrangement is unalterable, note it and plan your charts and other aids accordingly.

You should also test the room's acoustics, and it is wise to note the temperature of the room so you will know how to dress most comfortably.

Finally, and most importantly, you must practice your presentation again and again. One school of thought recommends two hours of practice for every 20 minutes of stage time, while another recommends a minimum of eight practice run-throughs. You should go over your material until you know it well enough to look at the audience 85% of the time.

Once you have done all this, there is no guarantee that your palms will not sweat and your heart will not pound when you first face your audience. But you will feel prepared and in control once you get into your presentation.

Berardo is a management counselor and career therapist. He is a vice-president with the Meld Group in West Hartford, Conn., publishers of a monthly newsletter on management development.

LETTERS

Selling Education

In *Computerworld*'s editorial "Talk Is Cheap" [CW, Feb. 7], President Reagan is cited as saying that institutions of higher learning would do well to be run more like businesses.

The editorial reply that "Such thinking constitutes a dangerous flight into free enterprise fantasy" can't go unchallenged. The only support offered for the statement is that education must perforce continue to be subsidized by the taxpayer.

The editorial ignores the facts: There is an inverse correlation between state-run education and its product, the graduate; the quality of education has declined as government has become more involved; and compared with private institutions, state universities have enormous undergraduate dropout rates.

This is money down the drain, and by advocating more government involvement, the editorial proposes throwing good money after bad.

The effects of the current system are insidious. Instead of striving to sell the best possible product, university administrations are devoting most of their time to the politics of greater subsidies, while faculty pursue research grants and publication. There is less incentive for all to get their money's worth when someone else (the taxpayer) is paying the freight. We are left with no incentive to teach and no incentive to learn.

Education is as much a commodity to be bought and sold as your own publication, which you are free to offer for consumption by the very same free enterprise system you so haughtily dismiss for other disciplines.

Gary Leclerc
Montreal, Que., Canada

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LETTERS

Establishing Recognition

Computerworld's editorial on certification, "Buying Certification" [CW, Feb. 14], reminds me of the story of children spending hours on the beach building an enormous sand castle, when along comes the beach bully who in only a few seconds can destroy what took hours to construct carefully.

I found the editorial presented a highly distorted view of our certification program. The Data Entry Management Association (Dema) certification program has been in development for almost three years. More than 60 of our members have participated in constructing the study guide and the actual questions that will be used on the examination.

The entire process is now under review by a panel of college education professors to ensure that the questioning process will be fair and represent clearly the body of knowledge covered in the exam.

My exact quotation stated the following:

"Those taking the exam, initially, will be experienced data entry managers. After taking the day-and-a-half seminar, which covers the fundamentals of data entry management, anyone should be able to pass the test. It will not be designed to trick people, but only those with the experience and knowledge of the subject areas will be able to pass."

Anyone "should be able to pass the exam" doesn't mean that everyone will pass.

Our profession is worthy of the respect and trust of our fellow associates in the field of data processing. The certification program is an important way to establish this recognition.

Norman Bodek
President

Dema
Stamford, Conn.

Consider the Truth

I recognize and appreciate the value of the editorial "Buying Certification" [CW, Feb. 14]. It is unfortunate that some readers may misconstrue some of the remarks as a global indictment of DP certification programs. On behalf of those who have invested a great deal of time in the promotion of responsible professionalism through the Certificate in Data Processing (CDP) program, I wish to offer some observations.

First, the CDP cannot be purchased at any price. It is a registered service mark that can only be earned. Its use by anyone who has not been awarded the CDP by the Institute for Certification of Computer Professionals (ICCP) or by the Data Processing Management Association (DPMA) through 1973 is illegal.

Second, the CDP, in context with both education and testing, is a mature program with a 20-year history. Those who conceived and implemented the program did so in anticipation of future industry needs rather than in response to past or current perceptions.

Third, the CDP represents a body of knowledge rather than a collection of transient skills. Those who hold the CDP are contributors to rather than recipients of that body of knowledge. Furthermore, they are practitioners (working professionals) rather than drones.

Fourth, the need for "recertification" and/or "continuing" education is a presumption that has strong support among many active promoters — as well as critics — of the CDP. For such a presumption to be completely valid, it must be made in a vacuum.

Consider the truth: Practicing Certified Data Processers (those who have not left the profession) must maintain their knowledge and skills on a continuing basis in order to serve their employers and clients effectively, regardless of the availability of officially sanctioned educational or testing programs.

Nevertheless, there is acceptance of the philosophy of continuing education among most practicing industry professionals, regardless of whether or not they hold the CDP.

It is in the context of the concept of education that a considerable amount of effort is being expended. The DPMA's Education Foundation, its Special Interest Group for Certified Data Processers (SIG-CDP) and ICCP are addressing the special educational needs of both CDP candidates and those who hold the CDP.

SIG-CDP is developing a coordinated "Review Course for CDP Candidates," complete with text, presentation material, assigned work problems, "stress tests," review-course administration and instructor training. The package is targeted for availability in October 1983.

The second stage of educational program development is for those who hold the CDP. Although CDP continuing education has been "in the works" for some time, it is at a much lower priority than that of certification education. There are two primary reasons for this "back-burner" attitude:

- ICCP constituent societies have been presenting and sponsoring industry-specific educational programs for many years, and they are expected to continue this practice.
- The responsibility of the Certified Data Processer is to maintain informed about the services his employer or client requires. This usually means continued education in law, accounting, auditing, banking, insurance, manufacturing or

(Continued on Page 59)

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Australia: A Test Market for Japan's Micros

(Continued from Page 55)

nately, the CRT, printer and memory expansion connections do not require any of these positions. Also, an announced expansion unit is expected to provide an additional six-slot facility. The video can be either monochrome or color, the latter providing eight colors. The screen resolution is a satisfactory 640 by 400 pixel raster.

Turning to Software

Turning to the software, we find two operating systems announced — MS/DOS and Digital Research, Inc.'s CP/M 86.

Inquiry revealed, however, that only the former is presently available. CP/M is slated for early 1983.

In addition to the already mentioned training vouchers, both the MS/DOS operating system and Microsoft, Inc.'s spreadsheet package, Multiplan, are bundled in the JB3000 purchase price.

System Cost

This brings us to the cost of the system: for a 128K-byte memory unit, including an 80-col. dot matrix printer (see box on Page 55).

A similarly configured all-IBM Personal Computer system with comparable software retails in the U.S. at about 15% less.

This difference in price may be due to the premium that is usually charged on imported hardware in Australia. In the case of the JB3000 configuration, only one of the three slots will be used, whereas in the case of the IBM Personal Computer, three or four of the available five will now be taken, depending on options selected.

Claimed Compatibility

The item of most interest was the claimed compatibility with the IBM Personal Computer.

As suspected, the units are not plug-compatible. One cannot directly operate IBM Personal Computer-prepared diskettes with the JB3000. It is necessary to convert the diskette format of one system to be readable in the second. It can then be expected that MSDOS/Basic programs designed for IBM operation will execute on the Panasonic system.

This sort of veiled compatibility should be contrasted with true replacement, such as the American-made and American-offered Multi-Personal Computer from Columbia Data Products, Inc. or Corona Personal Computer from Corona Data Systems, Inc.

The JB3000 is only one example of what is being tried out by Japanese vendors in Australia; there are other systems, such as those of Hitachi Ltd. With this kind of start in Australia in 1981 and 1982, the Japanese should be ready to sweep into the U.S. in 1983.

Frank is an independent consultant and president of the W.L. Frank Computer Group located in Calabasas, Calif.

LETTERS

(Continued from Page 58)

wherever "service" applies.

The notion that the practicing Certified Data Processer should be periodically "recertified" is vacuous under present circumstances.

Robert R. Cromer
Education Director
DPMA SIG-CDP
Irving, Texas

Elevating Professionalism

I read with great interest the editorial "Buying Certification" [CW, Feb. 14]. However, I found the headline misleading and false in its connotation. The Data Entry Management Association (Dema) certification program, like those offered by other professional organizations, cannot be bought. Without the background knowledge, acquired either through experience or educational courses, one would be unable to achieve certification.

The editorial states: "Professionals do not have a choice. It is imperative, particularly in technology-related fields, they keep current with rapidly changing technology in order to serve their users to the best of their ability. This is that keeps professionals professional. And this is not possible without a minimally recognized level of knowledge in the field."

The preceding paragraph indicates clearly and precisely the purpose of the Certificate in Data Entry, which is to increase the level of knowledge in the field, thereby elevating the professionalism in the DP industry.

One has to agree totally with the closing sentence of the editorial; "Professionalism must be earned."

Barbara S. Bradley
Vice-President
Dema
Stamford, Conn.

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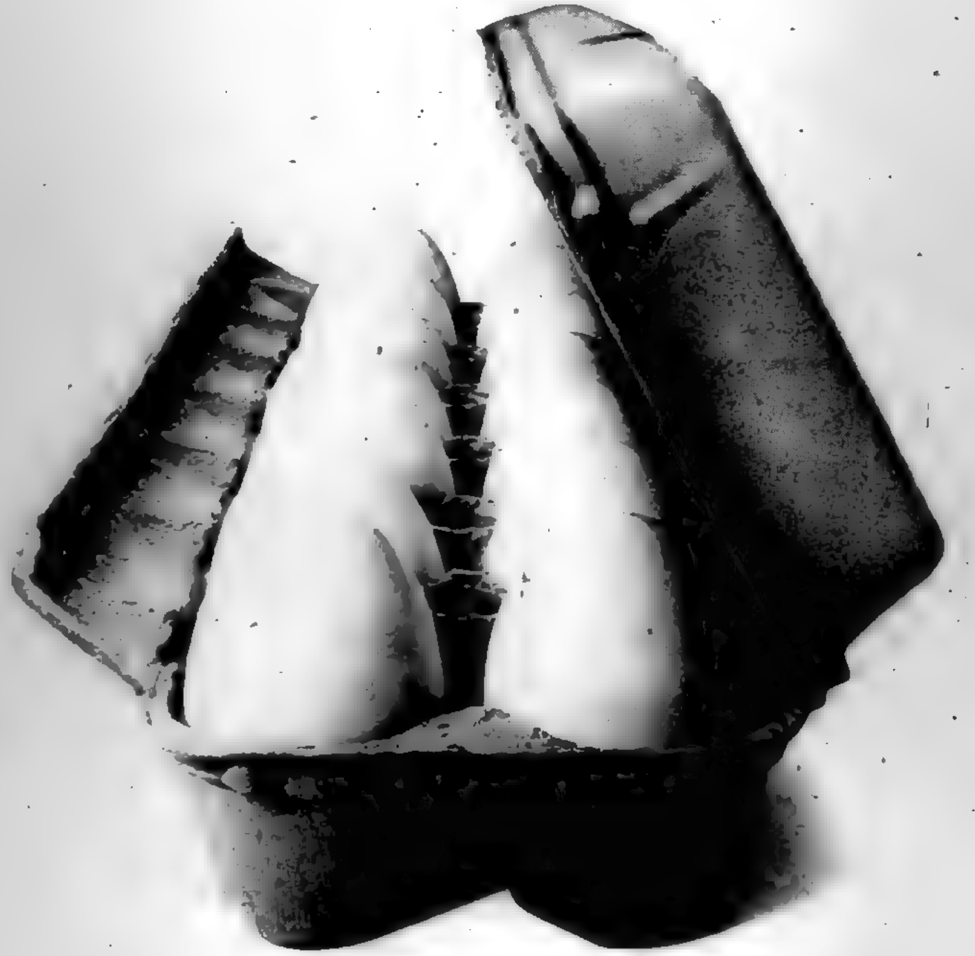

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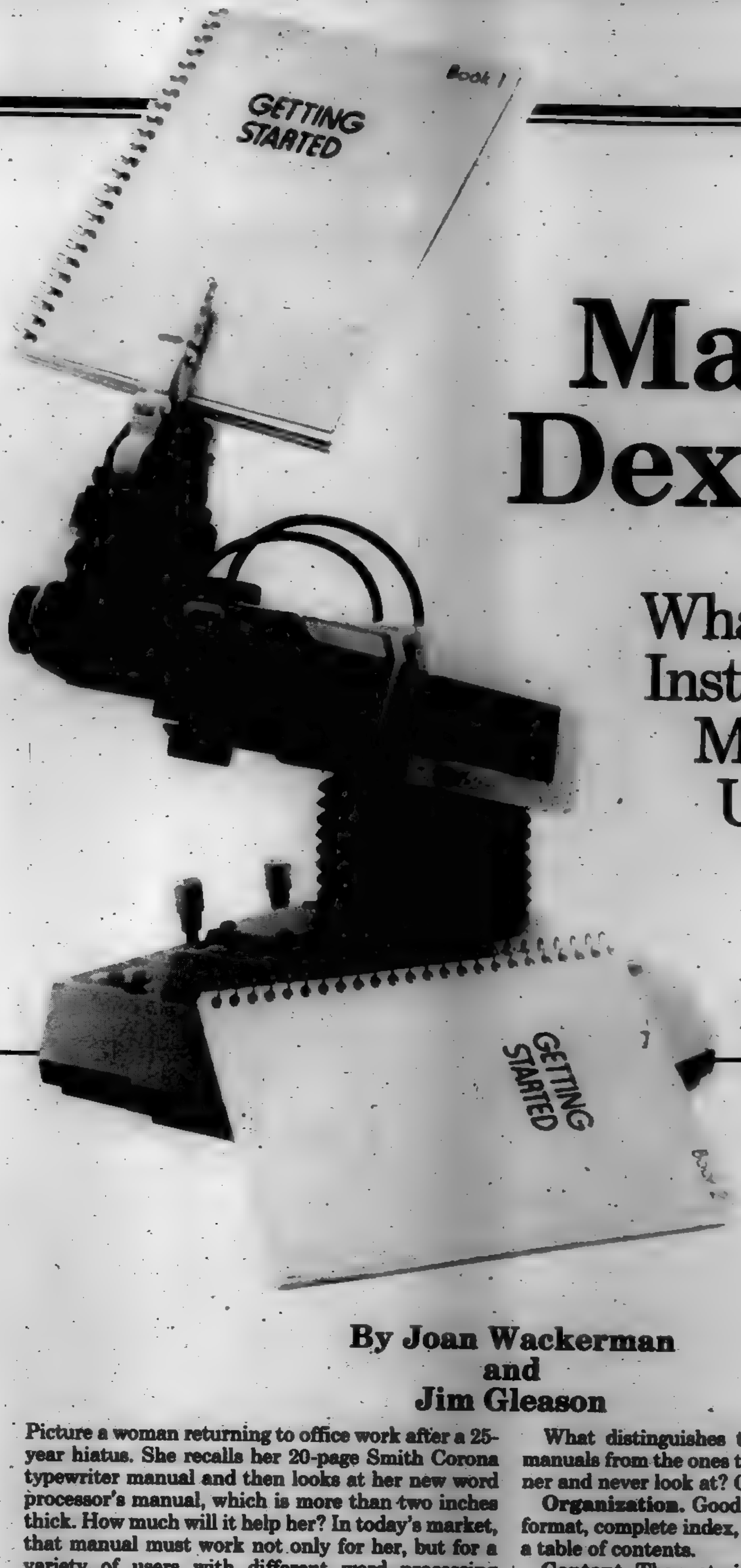

PHOTO BY KATHLEEN [illegible]

By Joan Wackerman and Jim Gleason

Picture a woman returning to office work after a 25-year hiatus. She recalls her 20-page Smith Corona typewriter manual and then looks at her new word processor's manual, which is more than two inches thick. How much will it help her? In today's market, that manual must work not only for her, but for a variety of users with different word processing backgrounds.

If you are buying any kind of new equipment, of course you want manuals that explain how to use it for the jobs you want to do. How do you select a system that has a good manual?

Or, if you are a new product developer, how can you ensure that the documentation you develop is going to meet the users' requirements? How can you make sure that your manuals will be simple, easy to use and appropriate for your target market?

What distinguishes the best and most popular manuals from the ones that people toss into the corner and never look at? Consider the following:

Organization. Good manuals have a structured format, complete index, sections set off by tabs and a table of contents.

Content. The material is concise, focuses on operator tasks, contains practice exercises and provides clear illustrations.

Appearance. The presentation is attractive and colorful, contains plenty of white space and is "packaged" in booklets that are small and easy to handle.

Language. The text is conversational and easy to read, basically geared toward an eighth-grade reading level.

On the other hand, we have found that operators do *not* like documentation that:

- Has too much information or detail.
- Has a demeaning or childish tone.
- Is formal, stiff-sounding or full of jargon.
- Has poor printing quality (broken type and so on).
- Is poorly organized, with the result that information is hard to access.
- Is inaccurate.

In seeking the right manual, first look for the most usable documentation available. That is, it must enable your users to do what they want to do with the equipment. This usually means two different kinds of documents need to be available: an operator guide (for training) and a reference manual. Also, you might want some sort of job aid, such as a quick reference card, to summarize keys, functions and possibly the most common procedures.

Why so many kinds of documents? First, the operators need a training manual to take them step-by-step through the equipment's uses. This kind of documentation needs practice exercises. On the other hand, the reference manual should be organized in a more traditional sense around system features and functions. As a rule, it should also provide a greater level of detail.

One recent trend that is becoming increasingly popular among equipment manufacturers is toward customer problem-solving and repair. In most cases, this means the manufacturer will provide some sort of problem determination guide and the operator will use it to isolate machine problems. On the positive side, this approach can significantly decrease system downtime for things like operator error. On the other hand, the guide itself may be difficult to use. The same criteria for usable manuals apply here — maybe more so, as these guides are usually very task-oriented and instructions must be followed exactly.

Further, if the operator is expected to repair some part of the machine, not only must the manual be explicit and usable, but the task must be practical. Check that the

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operator is not expected to do anything beyond his technical ability.

Keep Content Brief

How do companies keep manuals small and friendly when there are complex features to cover? One way is to divide one manual into separate booklets, based on different procedures or tasks. These booklets can be contained in one box or ringed binder and are similar to the reading kits available in the schools.

Another and perhaps better way is to ensure that the manual spells out only the content that the user needs to know to do his own tasks. For example, in word processor documentation, users will want to know how to put text on the machine, edit text and print it out. Certainly, the first portion of the manual must address only those issues. (Often the hardest battle for the author is preventing engineers from putting every detail about how the system operates in the manual.)

Users only want brief, boiled-down, step-by-step keystrokes for the operations they want to do. Thus, if you produce documentation, one way to keep your content slim is to identify the series of tasks your users will perform and then list the step-by-step procedures for doing those tasks on the equipment. Avoid covering all functions of the machine in an operator's manual. People will learn how to do many of the functions by experimentation. The place for detail is in the reference manual.

Practice exercises should be short and interspersed systematically throughout the structured format. They should be clear, procedural and should provide feedback to the operator as to what he did right or wrong.

> ***'Avoid covering all functions of the machine in an operator's manual. People will learn how to do many of the functions by experimentation. The place for detail is in the reference manual.'***

Illustrations should be as simple as possible. Good technical artists know how to take a complex piece of equipment and represent it simply. Authors of good manuals use their artists' expertise (or ask for their ideas) to produce these simplified illustrations. Remember that the reason for having illustrations is to clarify an idea and to avoid using a large number of words to explain a concept.

All illustrations should reduce the number of words required and should stand alone — that is, they should make sense together with the caption and callouts.

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should be very apparent to the user. The operator's manual should be sectioned off according to commonly performed tasks or the way people will use the equipment. This is in contrast to organizing by functions or what the machine can do — an approach more appropriate to organizing engineering materials. Where possible, the task sections should be separated by tabs. Further, these sections should be broken down into elements that are the same for each section. For example, you might want to have a preview, a brief system overview, the main content, practice exercises and then a review.

> *'A structured format forces you as a writer (or your writers, if you are a manager) to provide only information that fits the format. This prevents rambling, unnecessary content and excessive detail.'*

When producing documentation, a structured format forces you as a writer (or your writers, if you are a manager) to provide only information that fits the format. This prevents rambling, unnecessary content and excessive detail. Further, users *like* a structured format. It makes them feel comfortable — and they can skip sections they know they won't need.

Once they work through a few sections and know what to expect under each kind of heading, they can successfully skim for the information they need. And whether we like it or not, users will skim and will also skip sections. That's the way people use manuals; they are often impatient to do something and need information quickly. For this reason, it is important that a manual remain somewhat modular — especially for equipment with many and diverse functions. Every user will not use every function.

The index must be complete and must be approached from various directions: features of the machine, functions of the keys, tasks the operator wants to do and so on. Users must be able to find information for a variety of reasons. The most popular documents let a user quickly find the page he needs.

Appropriate Language

It is fairly well known that jargon should be avoided in technical documentation. Terms must be as simple as possible, and their use must be consistent; the reader should not find a variety of terms for the same concept. Further, when a successful writer introduces a new term in context, he tries to tie it to something concrete that the user already knows. For example, the writer contrasts the way a particular key on a word processor works with a similar key on a typewriter.

There is some new documentation on the market now that attempts to be conversational, but ends up being demeaning. It is not easy to write a readable document that is not patronizing — that is, uses childish language, or tells the customer to do something that sounds too elementary. For example, several users recently complained that in a particular operator's manual, the text told them they were "doing a great job and they should take a break." The users found this somewhat presumptuous and resented it.

A good rule of thumb is to read the manual out loud. If you feel it sounds patronizing or demeaning, others probably will too.

Managing Development

If you are managing the writing or development process, you need to do several critical things to turn out a set of documents that really work.

First and foremost, you need to ensure that the materials are tested, tested and retested. Do not allow your writers or yourself to become ego-involved with the manuals to the extent that you cannot change

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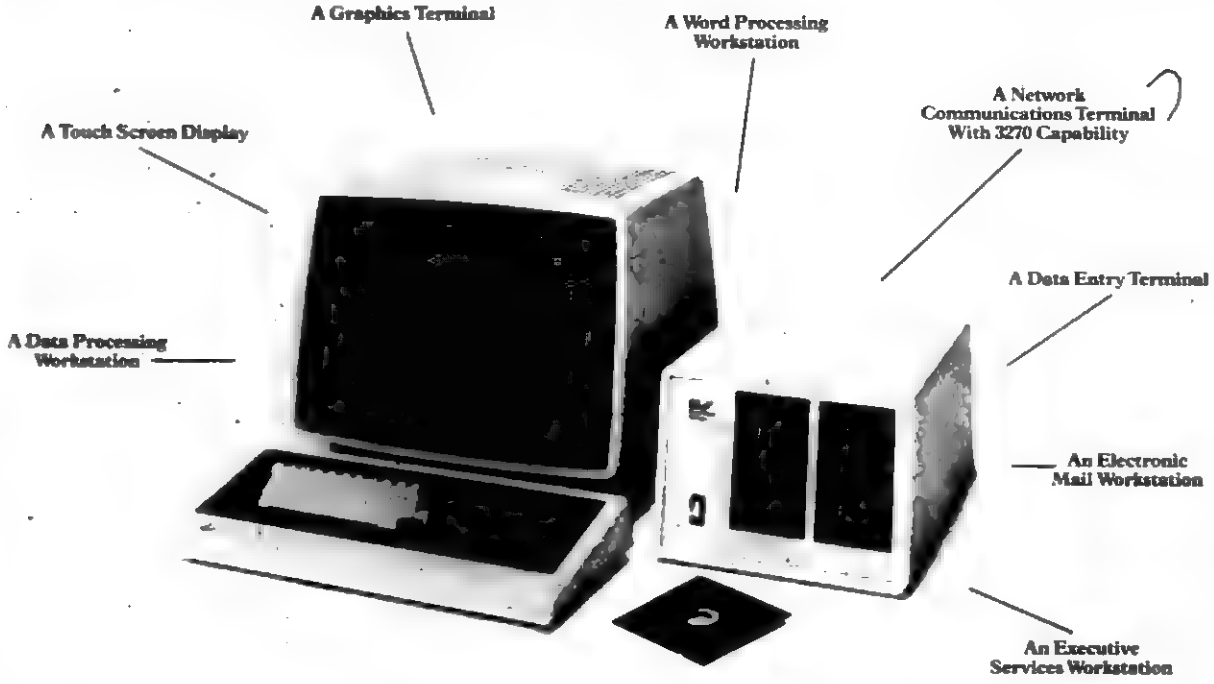
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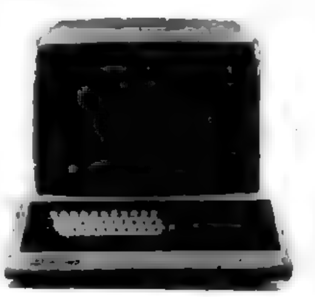

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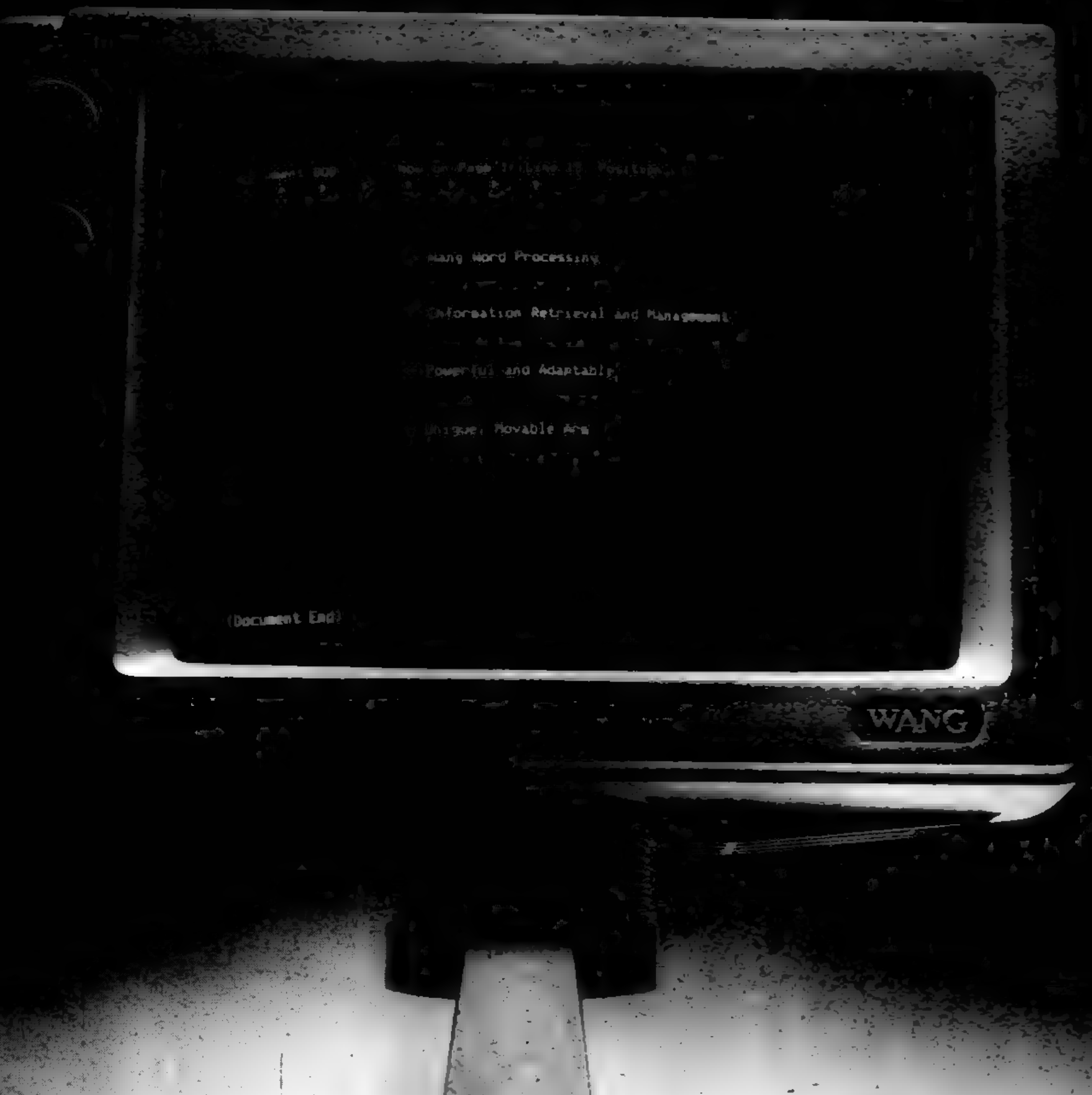

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them to make them work. The manuals must work.

As you begin the documentation process, use an instructional designer or an experienced document designer to give input to your format. It is worth hiring a consultant for a day or two for this, if necessary. The format will act as a blueprint or specification for all your writers. It will give you the tool you need to ensure that the documentation that is produced is relevant. The document should be designed based not only on what the machine can do but, more importantly, on what users will do with it.

Stay close to your users. Interview them and find out how they use and intend to use the equipment.

Once you have your format designed, meet with your writers and show them a model section of a manual, using your format. Also, show them some good examples of existing documentation that are similar. Next, train your writers to write to the format. Make sure the editor is part of your team all along the way. Involve him in the design of the format and the writing of prototype sections. Then ensure that as each author begins to write, he will frequently submit outlines and drafts to the editor.

Give writers immediate and frequent feedback on what they are doing right and wrong. The more specific you are about what is and is not working, the better off your final product will be.

We will not go into detail here about how or why to write at lower reading levels. There are many guidelines available on how to do this. In short, it means using short, simple, concrete words and writing in short sentences. Have someone check the readability of your documents by hand or send it through a computer program that analyzes reading level.

The important thing we want to emphasize is that it does not hurt to aim for an eighth-grade reading level for any document. Brighter people are not offended by simply written material. They just read it faster.

Arrange to have one editor, if possible, edit all your documents for a piece of equipment. Then ensure that this editor understands the importance of using terms consistently and keeping the language simple, clear and readable. Again, make him a part of your team.

Making It Look Good

We all know that we are drawn to documentation that is attractive. But what makes it attractive? A variety of characteristics — color, novelty and simplicity, for example.

How do you develop a creative, attractive package? If you are a writer or manager, let your artists be creative — give them full rein to select typography, layouts and covers. Tell them what kind of reaction you want the user to have when he sees the package and let them come up with ideas. It is wise to have at least two artists working on ideas in parallel before you decide on one.

The most recent finding is that users like documentation that is small. They like the smaller 6-by-9-in. size as opposed to the traditional 8½-by-11 manual. Why? It is less intimidating. Also, when you are operating a piece of equipment and using the documentation, you often put the manual on your lap. It is awkward to use the machine if the book is large.

You will also want to provide some attractive job aids for the various functions, features and commands on the equipment.

Those of us who produce documentation find it important to take time to make sure there is plenty of white space and the layout is clean, simple and useful.

Let the final test of how the material should look and read rest upon customers or users. Keep as close to the users as you can.

About the Authors

Joan Wackerman is manager of instructional development for the Human Resources Research Organization, a not-for-profit company in Alexandria, Va. She manages training contracts that require simplified training manuals.

Jim Gleason is a technical writer for the IBM Information Systems Division in Lexington, Ky., where he produces instructional and reference documents for office equipment.

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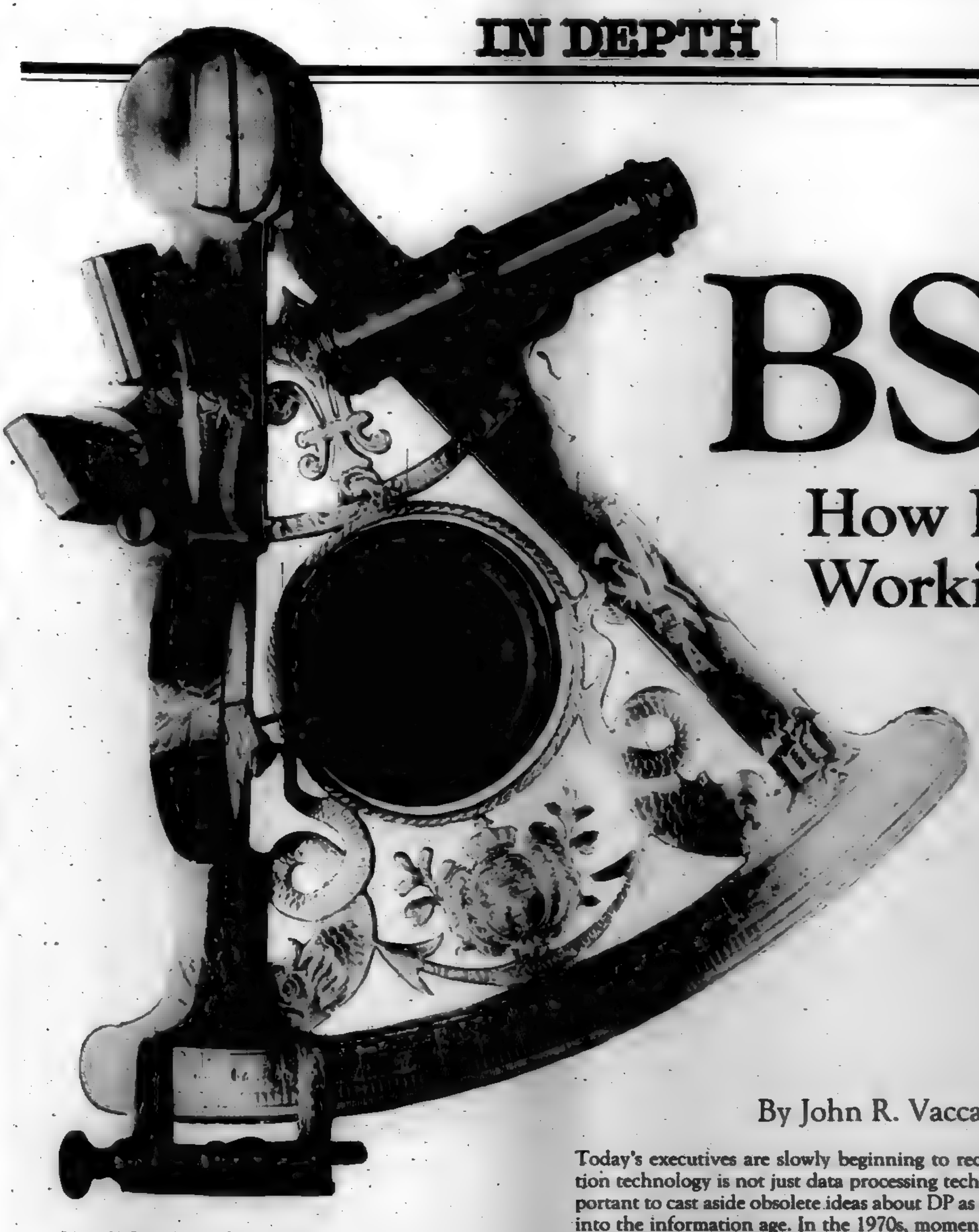


Courtesy of the Peabody Museum of Salem, Massachusetts
Photo by Mark Sexton

BSP
How Is It Working?

By John R. Vacca

Today's executives are slowly beginning to recognize that information technology is not just data processing technology. It will be important to cast aside obsolete ideas about DP as corporations proceed into the information age. In the 1970s, momentum built toward the penetration of information management into non-record-keeping tasks. Now, ready to come of age in the 1980s is the application of this technology to aid management.

In recent years, there has been a proliferation of innovations in data processing, office information systems and telecommunications. Cost-effective transaction processing is replacing traditional data processing. In the '80s, the vision of information managers will be focused on corporate communications through teleprocessing, integration of information resources and executive and office information systems. Management will need a program comprised of business and systems planning (strategic planning).

I recently completed an informal survey of 112 U.S. corporations on the implementation of IBM's Business Systems Planning (BSP) methodology, defined by IBM as a "structured approach to assist a corporation in establishing an information systems plan to satisfy its near- and long-term information requirements" (see In Depth/11).

The purpose of the study was to determine whether BSP was implemented successfully, with special emphasis on its support of both the short- and long-term information needs of the companies.

We looked at various methods presently being used to implement BSP or some form of strategic planning. This was accomplished through library research, personal interviews with IBM personnel and telephone interviews with others knowledgeable in the area of BSP. Two hundred twelve letters and questionnaires were sent to corporations of various sizes that were implementing BSP or some other strategic planning methodology. We asked questions about their implementation procedures and data models.

One hundred twelve, or 52.8%, returned the questionnaires.

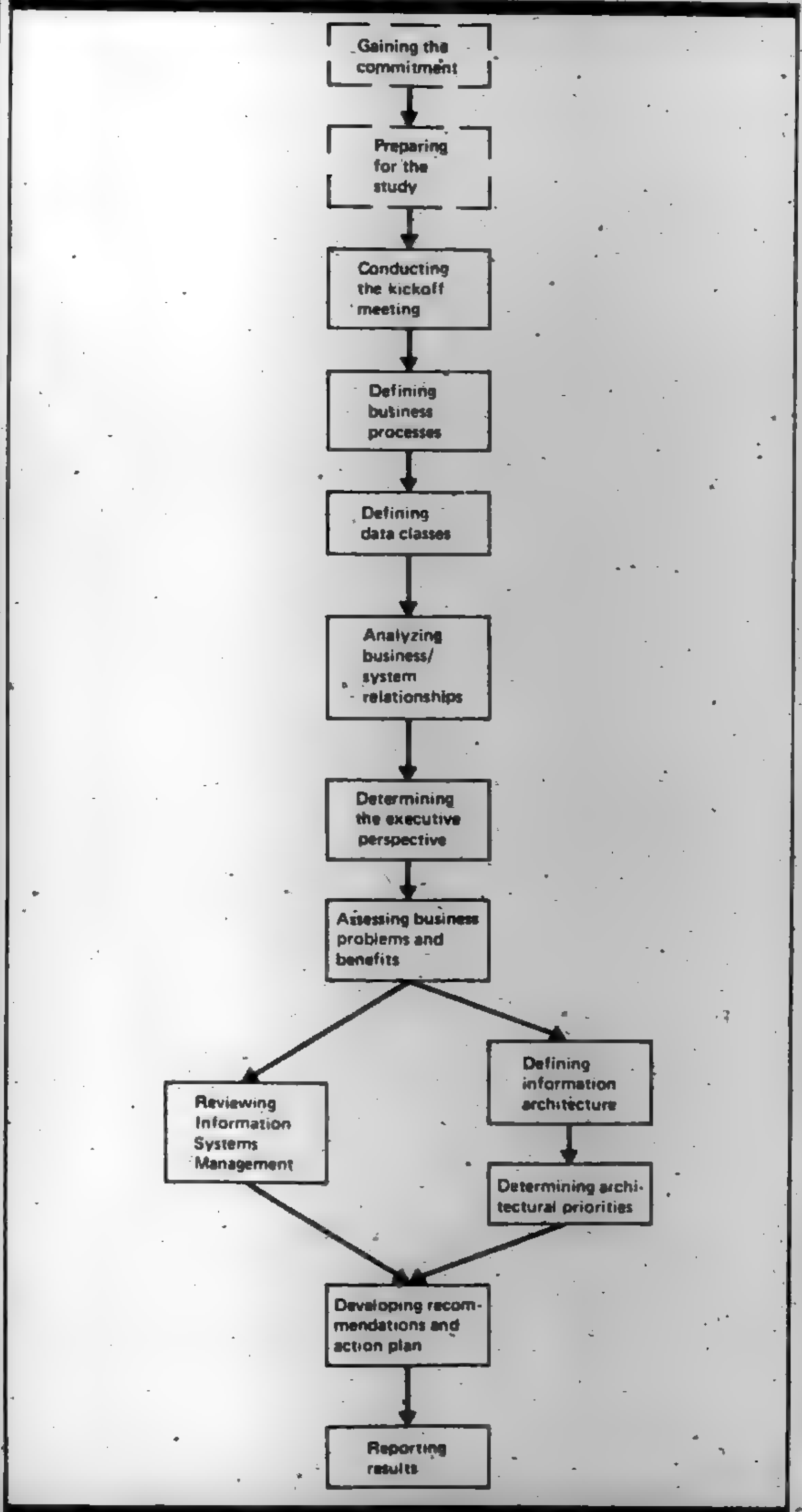
The following discussion summarizes information gathered from the five small ($3 million to $20 million in annual sales), 13 medium ($20 million to $99 million) and 94 large (over $100 million) corporations that responded.

In general, the respondents indicated that they benefited from BSP or some form of strategic planning by gaining a better working relationship with their end users, computer users and top executives in the corporation. BSP helped them obtain top management's approval of long- and short-term plans. Key strategies such as data bases and interactive and distributed processing with central control were supported. In many of the companies, the BSP concept provided the opportunity to introduce IBM's information center concept to satisfy many of top management's information needs.

Major BSP Activities

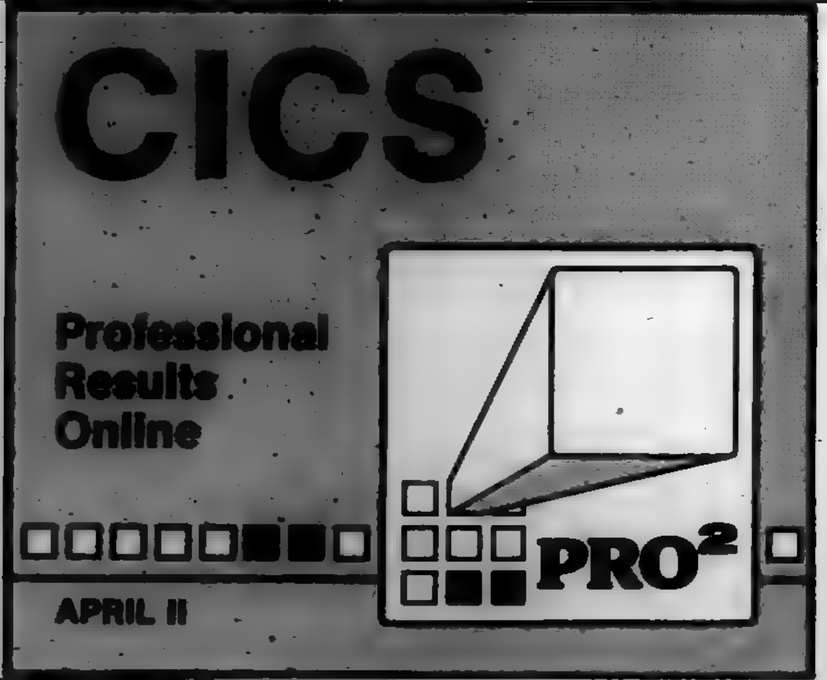
When developing independent applications for various user departments, BSP will contrast sharply with the traditional approach. The

(Continued on In Depth/12)


Gaining the commitment
Preparing for the study
Conducting the kickoff meeting
Defining business processes
Defining data classes
Analyzing business/ system relationships
Determining the executive perspective
Assessing business problems and benefits
Reviewing Information Systems Management
Defining information architecture
Determining architectural priorities
Developing recommendations and action plan
Reporting results

IBM Chart

Steps in a BSP Study



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A Corporate Strategy for Systems Planning

Business Systems Planning is IBM's structured, documented methodology for information systems planning. A BSP study is a corporate activity to establish an information system plan based on requirements defined by top management to support the business. During the six- to eight-week study, the data and systems required to support the business are identified and prioritized. The study provides an action plan for application development, data base development and continued information system planning.

While BSP, developed in 1970, is not the only strategic planning methodology around today, it is the root from which the others have evolved.

Until recently, the typical approach to developing data processing applications was to undertake each one by itself. Typically, organizations gave insufficient thought to the potential value of sharing information across application boundaries or supplying it to management for purposes of improved control. Certain business information needs went unfulfilled, resulting in data redundancy, excessive use of DP resources and insufficient return on the DP investment.

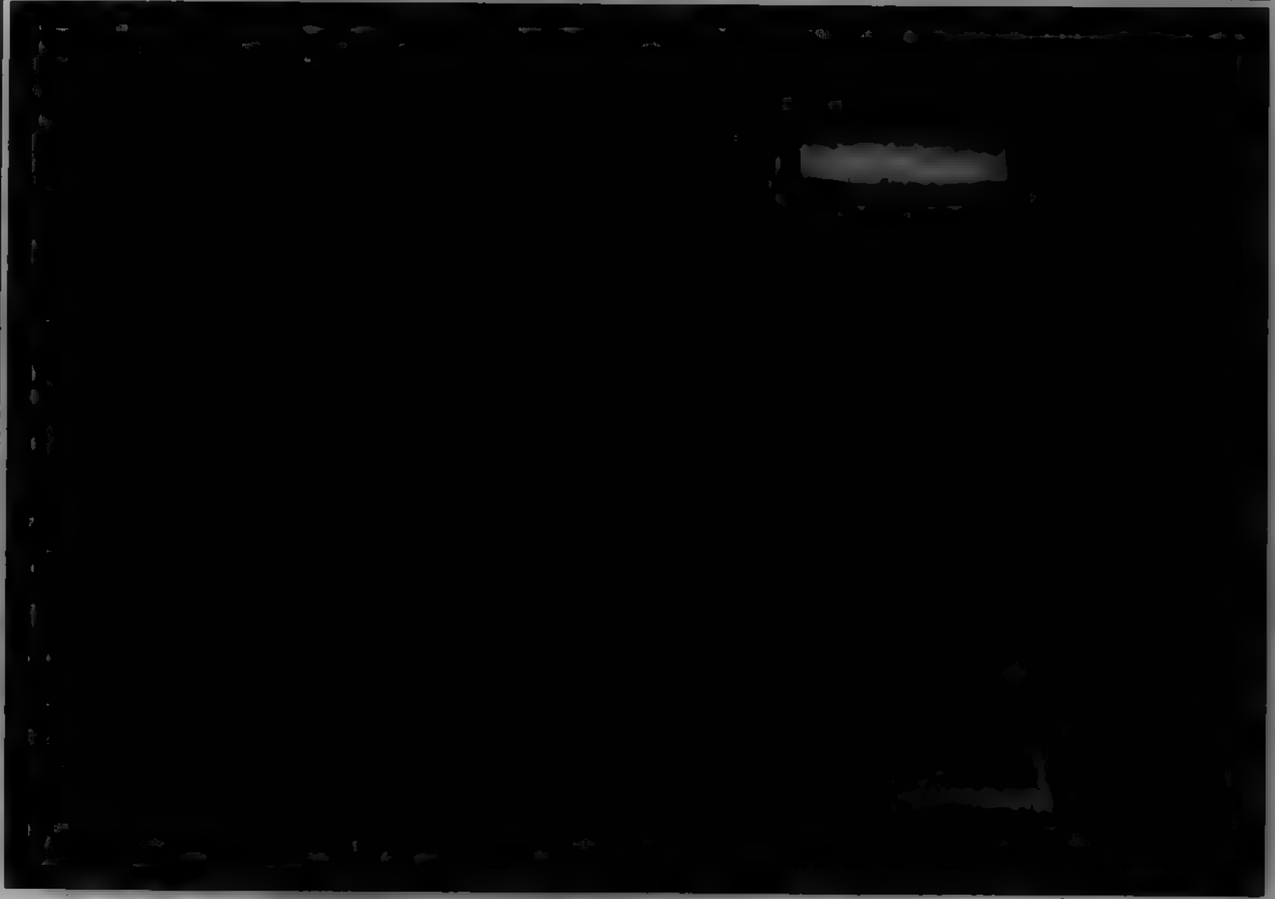
IBM's stated objective of BSP is to establish "an information systems plan to satisfy a corporation's near- and long-term information needs."

How Systems Succeed

BSP is also based on a conviction that the success of any businesswide information system depends on the following: executive commitment; establishing information systems objectives; understanding the business; using a "top-down" approach in studying the business; using a "bottom-up" approach for implementation; creating a plan that builds from existing systems modularly to an integrated architecture; and installing information management functions.

In addition, BSP provides for the impartial establishment of information system priorities, development of long-life systems, management of DP resources, increased confidence in a high return on information systems investments, better relationships between the systems department and users and an increased awareness that data should be used as a resource by everyone.

The plan that results from a BSP study represents the best thinking at a certain point in time; it should not be considered unchangeable. The real value of the BSP approach is that it offers corporations the opportunity to (1) define an information system function to continue the planning process and (2) create an initial plan of action and environment that can enable a business to react to future changes in priorities and direction without radical disruptions in systems design.



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(Continued from In Depth/10)

different information needs of general management, functional management and operational management are recognized by a BSP study. Systems are designed with a general management perspective and are aligned with the corporation's business goals; therefore, planning is top-down. Data is treated as a valuable corporate resource that is planned and managed like other resources.

Therefore, at the completion of a five-to seven-month BSP study, the corporation should be on its way to a comprehensive long-range information system and an action plan for short-term results. If a BSP study is structured, documented and supported by education, it should be successful.

BSP is part of an overall cycle for providing the business with required information. It is a methodology for identifying the business requirements.

Without regard to the total requirements of the business unit, projects in many businesses today are defined to address a functional area of the business. So, in order to avoid fractionalization of data and systems inconsistencies, BSP can provide overall direction for the business before projects are undertaken.

The BSP study progresses from the very broad world in which the business exists down to the data required to run the business. Business processes and objectives are then supported by the information system that has been defined in such a way as to categorize data into classes.

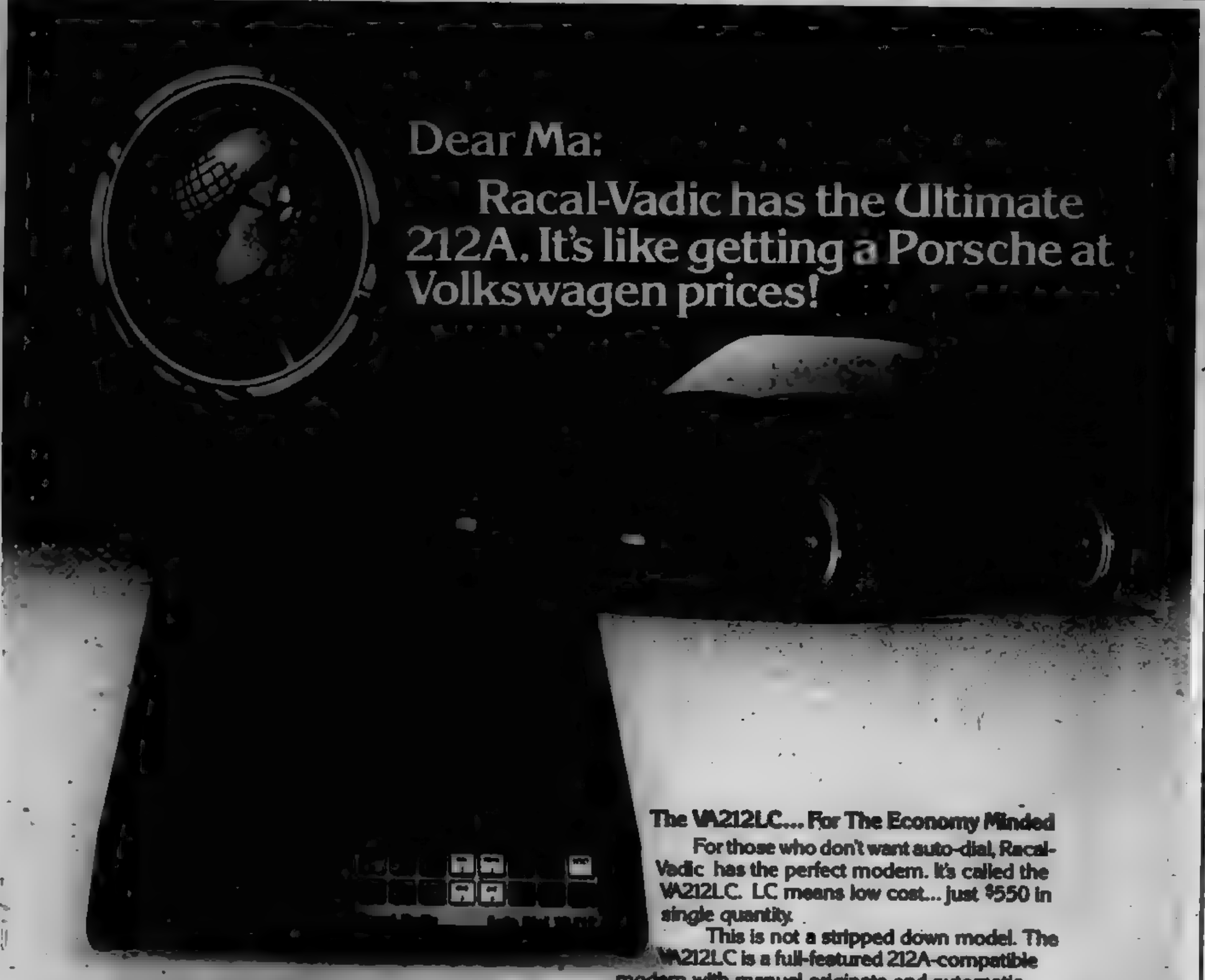
There are two major activities that precede a BSP study and 11 in the study itself, as shown in the figure on In Depth/10. None of the activities can be omitted, even though they may be carried out in varying degrees.

Gaining the commitment. The most important of the major activities is gaining commitment. Unless a top executive sponsor and some other executives are committed to being involved, the BSP study should not be started. The success of the study, then, depends upon the executives providing the information requirements and business understanding to the BSP study team. The team's work reflects the executives' view of the business.

In order to minimize future misunderstandings, it is important at the outset of the study to get an agreement on the scope and objectives and on its expected deliverables, since approval of recommendations commits the company for several years to a certain direction in the use of its DP resources.

Selection of the team leader, an executive who will work full-time in the study and direct team activities, is the most important action following the commitment. Once selected, the team leader sees that input from other executives is interpreted correctly and that contact with them is on the proper level.

In the survey, 62.5% of the respondents indicated that the commitment to start a BSP study was made by a top executive of the corporation. Thirty-seven, or 33.1% of the respondents, were not aware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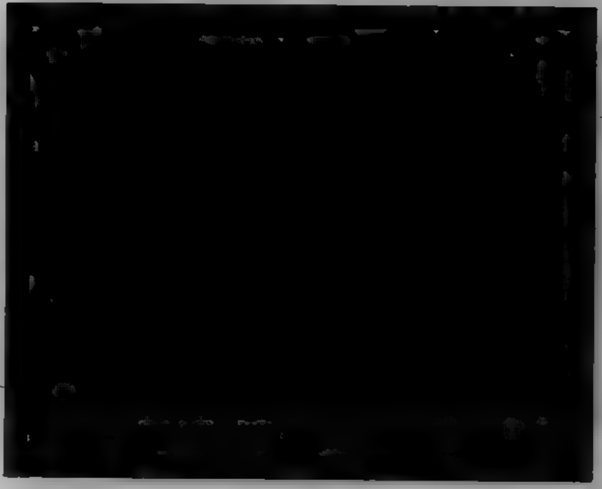

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of any commitment by a top executive to start a BSP study; and the respondents from five, or 4.4% of the corporations, felt that it was not applicable to their situation.

The commitment to start the study was never solely initiated by computer personnel.

Next the study objectives must be defined. Good objectives should be capable of being stated clearly and concisely. In measuring the degree to which they have been met, criteria must now be applied. They will only be applicable to the specific requirements of the organization to be studied. Within the defined study scope, they will be capable of being satisfied by the BSP study team.

> ***'The survey respondents emphasized the importance of the team selection process. The study team is responsible for determining the information needs of the entire business and recommending the nature of its data processing operations.'***

More than three-fourths of the corporations indicated that their study objectives were defined and satisfied by the BSP study team.

Commenting on this step, David Currin, application systems manager for J.C. Penny Life Insurance of Dallas, indicated that all of the study objectives were defined under his company's own strategic planning methodology called Resource Management Process. He indicated that his organization "prioritizes and manages strategic projects separate from shorter range operational projects, thereby protecting strategic work." In addition, he indicated that they use the project management system named Spectrum as a tool to support Resource Management Process

The survey respondents emphasized the importance of the team selection process. The study team is responsible for determining the information needs of the entire business and recommending the nature of its data processing operations. Kim Krámer, data base administrator for the Central Parts Division of Clark Equipment Co. (After Market Parts Distribution in Chicago) reported that their team members had several years' experience within the organization, a sound knowledge of their own area and an appreciation of the rest of the business.

Study Preparation

Proper preparations before the study save time, avoid frustration and lead to higher quality output. In this step, the expectations of the participants and the team should be outlined specifically.

Most of the corporations' team leaders held a half- to full-day orientation session to brief the study teams.

Preparation for the study was completed by a successful review meeting with the executive sponsor in 56.3% of the corporations that responded to the survey.

Initial meeting. The kickoff meeting includes the BSP study itself and full participation of the team members. Most of the respondents said that their team leaders walked through the business facts that had been gathered and made subjective comments and additions on facts that could not be readily documented.

The executive sponsors opened the meeting for about half of the responding corporations, emphasized the business reasons for initiating the study and explained the significance of the high-priority programs. Also in about half of the corporations, the study team leaders reviewed the work plans. A copy of the presentation was made available to the team members while they were developing their conclusions and recommendations. These copies helped them later in the study — during the interviews.

Business Process. Identifying the

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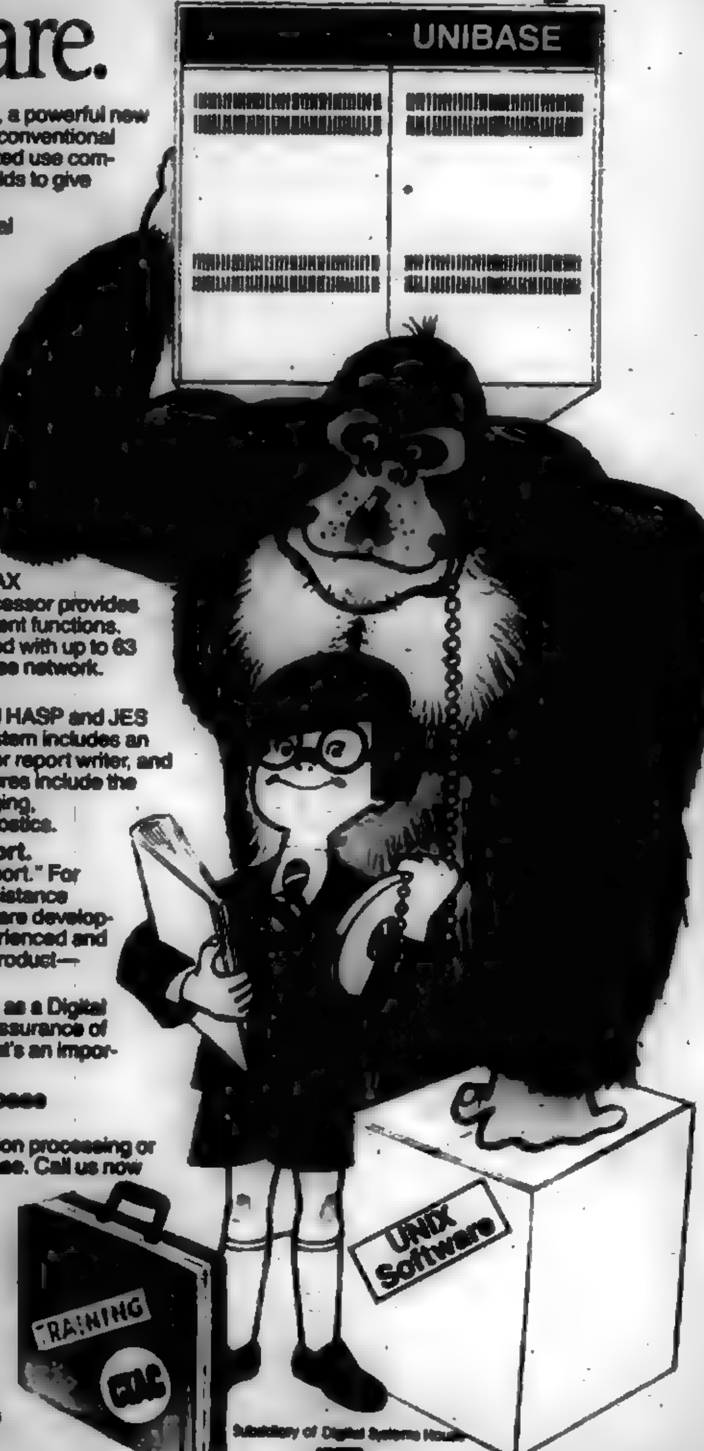

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business processes is one of the most overwhelming and important activities during the BSP study. Everyone on the team must be able to understand, identify and write descriptions of the processes. The major output from this step is a list of all of the processes, a description of each and the identification of those that are key to the business' success.

For purposes of the BSP study, the business processes were defined and "grouped into logically related decisions and activities that were required in the management of the business resources" by 51.8% of the corporations that responded to the survey.

As an alternate approach to identifying the business processes, a sample model of the business was used by 25% of the corporations.

Instead of using a model, John Cartin, ADP planner for the State of Kansas Department of Revenue in Topeka, explained that his organization's processes were "brainstormed," then discussed and defined. A list of taxes and fees that the agency administers was used to ensure completeness. The budget cycle provided a checklist for administrative functions, he noted.

Data class definition. Data class definition helps the business to develop data bases over time with a minimum of redundancy and in a way that allows systems to be added without major revision to the data bases.

The data classes were identified according to two approaches by 51.8% of the respondents: business entity and business process.

R.B. Wilmot, manager of data base administration for Amdahl Corp., Sunnyvale, Calif., commented that "data entities" instead of "data classes" better "suited their purpose" in defining and grouping data into logically related categories.

Analysis of business systems. In order to develop recommendations for future action, an analysis of business and systems relationships shows how data processing currently supports the business.

Various matrices were developed using the combinations of organizations, business processes, information systems and data files. However, 29.5% of the corporations eventually found out that even though matrices provided an overview of cur-

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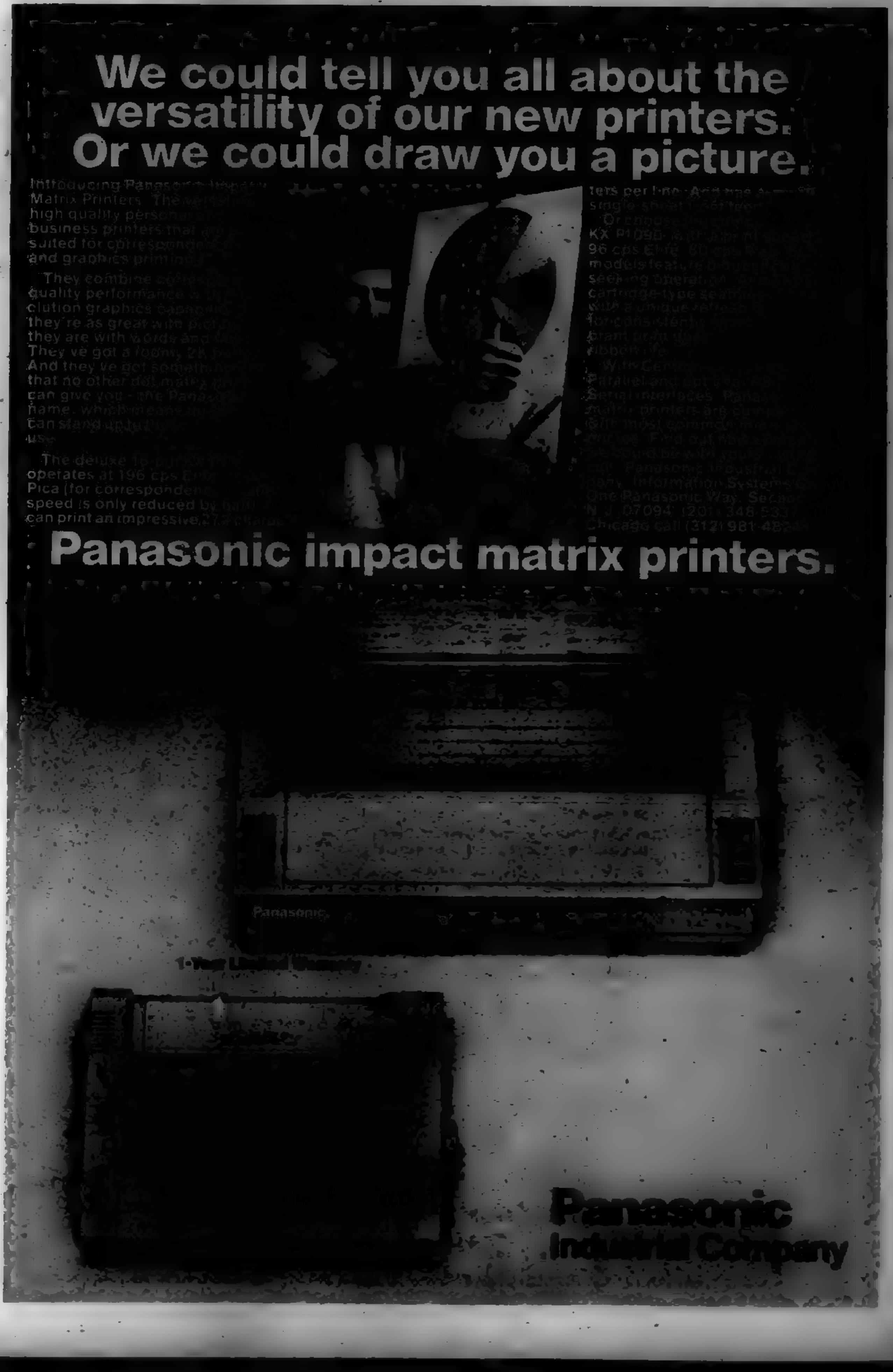

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rent and planned DP support they could not indicate the extent of support needed or the value of support to each of the processes.

Defining the information architecture. The major process of examining the present and arriving at a synthesis of the future is represented by defining the information architecture. Future information systems and their accompanying data are sketched.

After 40, or 35.7%, of the corporations had acquired an understanding of the business processes and the data required to support them, their teams continued the analysis by determining how the data was managed to support the processes. Also, the data could now be logically grouped into data bases after the data classes had been identified. Information systems became vehicles that were used to insert data and extract it from data bases in order to formulate useful management information to support the business processes.

> ***'The final report and executive presentation were the vehicles for obtaining executive management commitment and involvement in implementing recommendations from the BSP study. Even though report formats were agreed upon before the study, many of the formats had to be modified because of the results.'***

Establishing a controlled environment. The BSP study team must establish priorities for developing the systems and data bases, since a total information architecture cannot be developed and implemented all at once. Therefore, the team establishes which subsystems will be defined during the follow-on project by deciding which of the data bases should be designed and implemented first.

Many survey participants indicated that they identified and recommended follow-on projects to management immediately, in order to begin the implementation as early as possible. The foundation for implementing information systems was established on a "pay-as-you-go" basis.

Richard Branton indicated that the study team for Southern Co. Service, Inc. recommended priorities and that a "program review committee" estabishes priorities for his organization.

Presentation and final report. The final report and executive presentation for 51, or 45.5% of the corporations, was the vehicle for obtaining executive management commitment and involvement in implementing recommendations from the BSP study. Even though the formats were agreed upon before the study, many of the reports had to be modified because of the results.

Follow-On Activities

The BSP study should end after development of an action plan for the follow-on activities and a presentation for management approval. Of course, the follow-on activities and the emphasis placed on each will vary from one BSP study to another because of variations in findings and conclusions.

In order to support the business effectively, 40 of the respondents initiated a management information system. According to the recommendations of the BSP teams for 91, or 81.2% of the corporations, a high-priority system was developed and implemented first.

Financial Analysis

The results of this survey and telephone interviews with corporate executives indicate that companies are being forced to look at their assets in a much different way. Recent studies such as one by consultant A.T. Kearney show that from 10% to 95% of a corporation's assets may be tied up in analyzing and delivering information. An even larger percentage of these assets will be devoted to producing information in the near future.

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2651 Kentworth Way, Santa Clara, CA 95051 (408) 727-4391 equipment, systems and money that combine to produce effective decision-making information? Corporations that can answer that question and successfully implement the solution should outperform their competitors in the coming decade.

If the information agent is managed well by a company, that corporation probably does a lot of things well. It is likely to have a well-thought-out long-range business, manpower and capital budgets plan — and most likely monitors its performance against these plans.

> ***'During strategic planning, any lack of top management support can be serious and even fatal to the plan. Managerial support is needed not only in getting started, but also in following up to measure adherence to plans.'***

BSP requires diverting manpower and other scarce resources from more immediate tasks. Discipline and constraints are imposed by BSP on managers and higher level business executives. Managers often view constraints as hostile to their short-run interests. Therefore, during strategic planning, any lack of top management support can be serious and even fatal to the plan. Managerial support is needed not only in getting started, but also in following up to measure adherence to plans.

Carefully conceived policies and procedures delineate the BSP study responsibilities, scope, methodology to be employed, the planning cycle and review and control. There can be little quality control over the study without adherence to the guidelines.

BSP resource commitment varies with the organization's computer intensiveness and size. Once the study is produced, the staff required to maintain it is usually less than that required to initiate it.

Team Effort

There is a formalized approach to implementing BSP. However, the task can be accomplished a number of ways. Perhaps the most important part of any implementation approach is establishing a planning task force or team. Team effort is vitally important in identifying conflicts among units and provides an incentive to adopt a companywide perspective.

The benefits of BSP accrue to both the information systems group and the organization as a whole. Greater unity and the focus of information systems management attention are included among those benefits. The prime ingredients for success are a common mission, greater communication and top management commitment.

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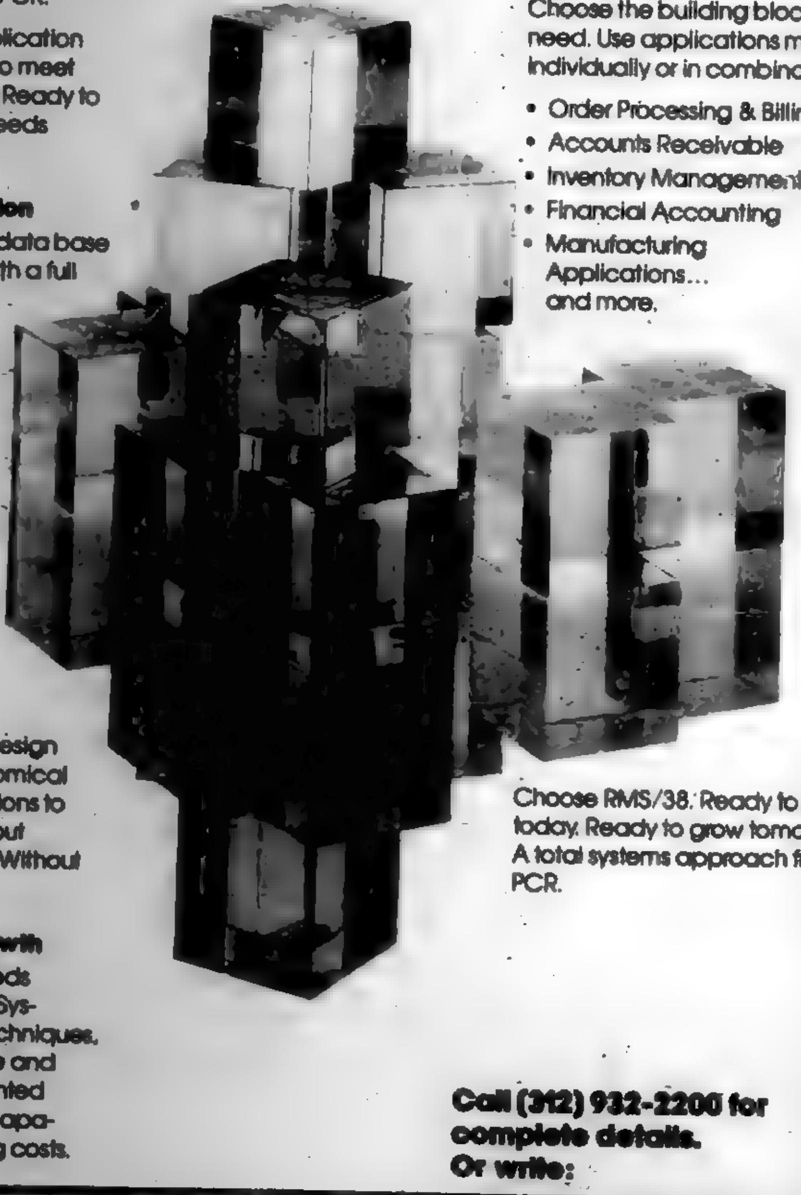
About the Author

John R. Vacca is a data base technician for the Atchison, Topeka and Santa Fe Railway Co. One of his major job responsibilities is the design of logical data bases.

Prior to joining the DP staff at Santa Fe Railroad, he was an internal auditor for three years.



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As features editor at the industry's busiest weekly, I'm inundated every day with manuscripts. They come in all shapes and colors: the classic management piece, how to normalize forms in data base, how to really get your applications backlog cleaned up this time. So into this world of ordinary manuscripts one day comes a sheaf of papers with an odd cover letter that modesty and good sense prevent my reprinting here. Suffice it to say its one redeeming quality was that it captured my attention, and I began rummaging through the manuscript. After an hour and a half I reached the inescapable conclusion that this was the most outrageous stuff I'd ever seen. But there was another surprise in store. The letter was signed "Jim Van Speybroeck," and the writer claimed to live in Illinois and teach college in Iowa. I immediately suspected he was schizophrenic. I sent him our standard acceptance letter, which he was required to sign and return; his signature resembled the scratchings of a plotter with a damaged arm. My curiosity was piqued; I called this guy and all I got was an answering machine that sounded like R2D2. It was too much. I took the next plane to East Moline, Illinois, and when I walked into the residence of one Mr. Jim Van Speybroeck, I found a room juea by a humongous computer. It was the most incredible kludge I'd ever seen, made of junked parts from an Illiac III, two IBM 5100 terminals and a control console from what appeared to be a Whirlwind machine. Banks of magnetic relays clicked discordantly. Then I heard that scratchy voice from the answering machine again: "Hi, this is Jim Van Speybroeck. I can't take your call right now . . . right now . . . right now . . ." I couldn't believe it. Stepping up to the console, I tried stopping the thing, then noticed the date on the digital calendar: April 1. ▶

—Jack B. Rochester
Senior Editor
Special Projects

By
Jim Van Speybroeck

YOU TAKE THE HIGH LEVEL, I'LL TAKE THE LOW LEVEL

I have had it with the terms "high-level" and "low-level" as they are used to describe programming languages. For the past 10 years, I have programmed in the Basic Assembler Language (or ALC, if you have IBM equipment). The flexibility and power of assembler are nothing short of exquisite. Assembler compares to Cobol as the Cathedral of Notre Dame compares to a pup tent. And yet, who gets all the glory? Who receives the accolades? Right! The Cobol programmer. After all, Cobol is a "high-level" language.

High-level implies nobility, truth and beauty. Low-level is life in the gutter. And you can forget the rationalization that "Oh, that's just industry jargon." That argument means nothing when the supermarket refuses to cash your check: "Oh, you program in a *low-level* language."

I suppose a great deal of my bitterness has historical roots. As an undergraduate, I majored in mathematics. Several of my courses were prefixed by the phrase "introduction to." The course material might rival the complexity of a Grecian labyrinth, but the title still contained that blasted "introduction to." I remember battling differential equations to the point of suicidal despair as my mother would quietly whisper, "But Dear, it can't be all that hard. It says on your report card, 'Introduction to Differential Equations.'" Believe me, "high-level" and "low-level" produce the same ulcer-prone condition.

Let's be honest. Programming in Cobol is like writing a pulp novel: shallow, easy and boring. But exploring assembler is a fascinating adventure, resplendent in awesome beauty; as exciting as a first visit to the Louvre. Yet, who gets all the medals? The Coboler. And what of the assembler programmer? This poor blighter eats in the kitchens and sleeps in the streets.

This inequity must cease. To all Cobol programmers reading this article, I toss my gauntlet at your feet as I bellow with absolute resolve, "You have fired on the lifeboats once too often!" It is time to fight back! Therefore, I propose the following: The government should fund a massive study comparing the nature, intelligence and personality of assembler programmers with Cobol programmers. I am certain the following results will emerge:

1. Assembler programmers physically resemble (depending, of course, on sex) either Hercules or Helen of Troy.
2. Even the most ordinary assembler programmer has the wisdom of Solomon. Cobol programmers have the I.Q. of a bush.
3. Assembler programmers are very articulate and are loads of fun at parties. Cobolers, on the rare occasions when they are invited to social gatherings, invariably end a meal with a piece of spinach between their teeth and can't wait for the band to play a cha-cha.

To continue with my Aristotelian insights, how shall I compare assembler with RPG? Fortran? PL/I? Pascal?

RPG is a tinker-toy language. For those readers who are unfamiliar with RPG, it is an acronym for Report Program Generator. RPG is a language invented by IBM for dummies. RPG reminds one of a "paint-by-number" project. Ostensibly, if you put the right paint with the right brush on the right number, you wind up with a masterpiece that rivals the ceiling of the Sistine Chapel. As you all know, what you really wind up with is a mess. Now if you only had one or two numbers with one or two paints, your picture probably wouldn't look all that bad (like a flag or something).

When IBM invented the language, they intended RPG to accomplish

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only a few simple things. Ergo, the novice programmer would punch a few characters in a few predetermined columns of a coding sheet and the results were acceptable.

What IBM did not count on was the fact that there are millions of dummies out there. They all loved RPG. But after about six months, these users got tired of printing flags and wanted to do other things like design a program or build a Cruise Missile. Thus, IBM found itself in a rather unenviable situation. The company had to find a way of modifying a language that was originally intended to crawl into a language capable of the speed of the Concorde. Well, once again, IBM did it. So now; all you have to do is punch more characters in more columns and you can do lots of things.

RPG takes no talent, no creativity and no sense of logic, but it does require a great deal of patience because nothing happens in RPG unless certain things called indicators are turned on or off. And when you want them on, they are always off and when they are off, you always want them on. This is difficult to explain, but ask any RPG programmer and they will verify same. However, all of this is secondary to the fact that as a language, RPG does not deserve to shine the bootstraps of assembler.

Fortran (for "Formula Translation") is a computer language invented by mathematicians for mathematicians. Calculating is fun in Fortran. Even the names for calculating are fun — like SQRT for finding square root. Fortran is a snap if you are a scientist or an engineer. However, business people hate the language and can't stand the way Fortran programmers dress — that is, in white togas with big buttons saying "DO" and "GO TO" pinned all over.

There really is no need to elaborate any further. Suffice it to say that assembler compares to Fortran as a monastery compares to a bordello.

PL/I was also invented by IBM. This language takes the best of Cobol and the best of Fortran and combines these features to form what IBM hoped would be the Mount Olympus of programming languages.

The whole project was doomed from the start. The initial problem was the name. At first they chose Cobtran. However, that didn't "sing," so they picked Forbol, which was even worse. As a compromise, they settled on PL/I or Programming Language One which, they reasoned, was dull enough to bother no one. (However, the reader might be interested in another name which I suggested: Forcobtranol. I thought it was real catchy, but IBM never returned my calls on the matter.)

As I said, from the point of inception, the whole project went down the drain. Jealousies were particularly severe. The Fortraners claimed that there were too many Cobol statements in the language and that the Fortran statements were diluted. The Cobolers said that the Fortran statements in the language were ruining their reputations and bringing down software values. The end result was constant backbiting and, eventually, vandalism.

In Framingham, Mass., four scientists were arrested for breaking the windows of a car that displayed the bumper sticker, "Honk if you love Cobol." Again, why should we go on? If you like violence, program in PL/I. If you wish peace and tranquility, program in assembler. However, the inequity still exists: PL/Iers are invited to join country clubs. Assembler coders aren't even allowed in public parks!

By this time, it should be perfectly obvious to the reader that I am the very soul of objectivity. Therefore, in justice some reference should be made to the relatively new languages, Pascal and Ada. Both of these languages do have some advantages in the way in which they manipulate data. However, neither language has the "macho" appeal of assembler. I look for both Pascal and Ada to be relegated eventually to a sort of off-the-wall occult status.

I hope this brave, objective defense of assembler will cause the language to gain its rightful place as the highest of the "high-level" languages.

The Whole Truth On Computer Evolution

The computer is a swell machine. But, you know, computers just didn't happen over night. It took a long time for those miracle machines to evolve. And it's my guess you'd like to know the truth about this evolution. After almost three weeks of painstaking and off-and-on research, I have the unexpurgated scoop.

The original computer was a stick. On this stick, the prehistoric data processor could carve notches (collection) for each dinosaur who was attacking his cave, mutilating his wife and eating his children (obviously his scientific detachment was just super). By counting the number of notches (tabulation) and taking note of the number observed (analysis), the caveman could communicate with his fellows to determine migratory habits, proper feeding and adequate health care considerations.

The second-generation computer was known as the abacus. The abacus was invented by a Japanese mercenary who had a Chinese mother. The mercenary fought with the Romans in Hindu-Arabic countries. As you know (or should know), the abacus had popcorn threaded through string with a place value for all the days of the year except Christmas when, for some unknown reason, all abaci completely disappeared. But except for that day, it worked pretty well.

On one occasion, just before our Japanese mercenary murdered a Hindu-Arabic gentleperson, the two of them had had a drink together in a little bar in Casablanca called Rick's Place. The Hindu-Arabic gentleperson told the Japanese mercenary of an idea he had for a set of numerals with a place value system. The idea continued to fascinate the mercenary, and when he returned to Rome for R&R, he told his buddies about it. They didn't like the idea, so they killed him.

But a Venetian shriner, in Rome on a convention, overheard the conversation and picked up on it. Thus we got our first positional numeral system, the Venetian Numerals. Twenty years later, the city-state of Venice was sued by the Hindu-Arabic AAUP representatives and a judge ruled that the name "Hindu-Arabic Numeral System" be used on all further correspondence.

The next 400 years were a period of triumph and tragedy for mathematics and computer science. In the 1500s, Thomas Hariot, the English mathematician and astronomer, made significant innovations in methods of tabulation.

(Continued on In Depth/22)

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(Continued from In Depth/21)

However, when Carl Sagan tried to gain an exclusive interview with this very shy man, Hariot fled to Cairo, changed his name, dropped his research in mathematics and computer science and opened a combination pizza and mummification parlor. If it had not been for this unfortunate turn of events, we surely would have had Space Invaders and Pac-Man 200 years earlier.

The next giant step in the history of computing occurred in 1590 when John Napier, a Scottish mathematician, invented the logarithm, or "ratio-number." The logarithm is a cylindrical rod that can easily be inserted between broken or fractured bones to facilitate healing. The logarithm was used successfully to reconnect the head and body of the French mathematician Blaise Pascal when he got into trouble with Robespierre during the French Revolution. Pascal went on to build the very first mechanical calculating machine. (Leibnitz and Schickardt disputed this claim; both were very spiteful and became known as the Sour Apples II.)

No one could come close to a British inventor named Charles Babbage. In 1803, Babbage applied for federal aid to construct what he referred to as his "analytical engine." After 10 years, he had the thing up and running beautifully. But one of his principal assistants, Ada Augusta, the Countess of Lovelace, turned out to be his undoing. At that period in history, all programmers were expected to be male. Scotland Yard got wind of the matter and arrested both Babbage and Ada Augusta. They were subsequently shut up in a monastery and convent. The analytical engine was abandoned. The British government eventually sold it for scrap to a young American engineer, Herman Hollerith.

Hollerith was intrigued by the analytical engine because it reminded him of the Los Angeles skyline. His original plan was to disassemble the engine, reweld it and sell it to the City of Chicago as an art work.

However, at about that time, the government began to have trouble keeping accurate records for mailing Social Security checks. In 1890, the Bureau of the Census warned Congress of the danger of the situation. Worried about the next election, Congress authorized a competition to solve the problem of data analysis. Hollerith entered the competition, played the Rachmaninoff Second Piano Concerto and won hands-on.

Hollerith's system, known as the punched-card system, was a fantastic success. His original idea for the punched card came from watching player pianos. (It is interesting to note that Hollerith later admitted that he had never really played the concerto at all, but had slipped in a piano roll when the judges weren't looking. The judges did think it a bit odd that Hollerith was consistently two beats off from the orchestra; but dismissed the event as the result of a faulty multiplexer channel.)

Anyway, as I said, Hollerith's system was a success. He had redesigned the engine into three pieces of equipment: a pantograph punch, an electric tabulator and a semi-automatic machine gun (for protection against patent infringements). Using Hollerith's equipment, the government completed the 1890 census in one-third the time required for the 1880 census, despite a population increase of more than five people.

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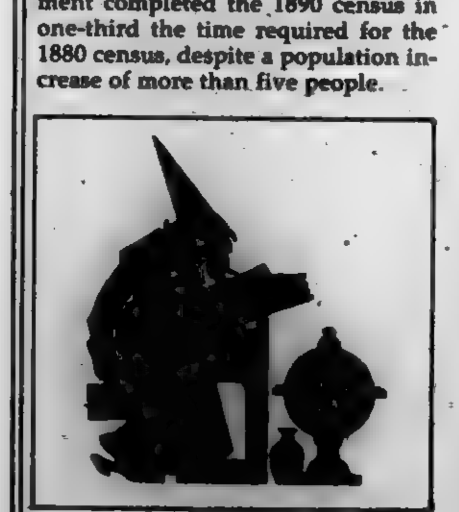

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Our teacher always talks about the CPU and the arith/logic unit and the wonderful things they do for us. But

RESPONDING TO THE NEW MANUFACTURING SYSTEMS–

are you ready?

From the requirements for a product, through the design and on to the actual finished product and shipment — every step of the manufacturing process is now being monitored by a computer. And DP/MIS departments are being asked to step in and make this process possible. If you're struggling with this now, or see this kind of demand in your future, *Computerworld's* April 25th Special Report on Manufacturing Systems is a "must read."

Stories to cover software, applications . . .

You'll get applications stories, tutorials, marketing information and original articles on everthing from manufacturing resources planning (MRP) to robotics and inventory and shop floor control.

You'll get a story from a lighting equipment manufacturer who uses a computing system to develop clean bills of materials, improve cash flow and other applications. You'll read about integrating CAD/CAM with technical publishing; you'll get a story about how one company runs milling off a computer to manufacture cataract lenses and lenses for subnormal vision.

And new products . . .

You'll get new product information — like an article from a major manufacturer about its new shop floor control systems designed for the "factory of the future," and an article about a software package that provides computerized analysis of manufacturing assembly procedures and financial tracking.

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DP/MIS Pros need to know.

If you're among the nearly 200,000 *Computerworld* readers employed in manufacturing firms — you'll need to be prepared to become involved in this vital new area of computing. As a DP/MIS professional, you're going to need the background and information this April 25th Special Report offers you on what's available to help your company take advantage of these incredible systems — if you're not already immersed in the process.

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COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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when I ask her where the arith/logic unit is physically housed inside the mainframe, she always evades my question. Could you please tell me?

Rebecca of Stonybrook U.

Dear Rebecca,

The physical location of the arith/logic unit has puzzled computer scientists since the first century. Ptolemy placed it somewhere between the Valley of the Kings and the Valley of the Dolls. Pascal believed it was close to the Folies-Bergere and searched for it most nights of his adult life.

But the answer to your question, Becky, is this: There is no solution, just intelligent alternatives. My personal belief is that the arith/logic unit is housed in the computer center somewhere between the forms burster and the wall separating the DP center from the washrooms.

Dear Computer Answerman,

I realize that overlapped processing is possible only if the computer system has the input/output channels. I also know that channels are those components which direct and control the flow of data between I/O devices and main storage. The sequence is explained as follows: The supervisor provides the channel with the address of the first command in a list of commands. After being activated by the SIO instruction, the channel then carries on with the I/O operations through a series of channel commands, with the first of the series being a Channel/Address Word. The list of commands then proceeds to a successful completion.

Although I have studied the channel procedure and concepts for several weeks, I find the whole thing very difficult to understand. Could you simplify the procedure?

Cap Nemo

Dear Cap,

Why are you wasting your time with this channel stuff? It's about as beneficial as an ejector seat in a submarine.

However, to assuage your curiosity, let me direct you to one source of information. In 1950, Harry Belafonte recorded a song called the "Channanel Byte Song" in which he explains the procedures quite well. It goes something like this: "I-Oh; I-I-I-Oh, Data Come And It Want Go Core." Technically this should be more than sufficient to meet your needs.

Dear Computer Answerman,

I have read your column since I matriculated at Villa Nova University four years ago. I have a double major in computer science and applied mathematics. My question, sir, is this: Do you have any idea what you are talking about? It appears to me that everything you write is gibberish. Let me cite just two examples.

In a recent article, a student inquired as to the cause of data exceptions in assembler language programs. Your response was, and I quote, "Data exceptions are caused by a 5- to 10-mile-per-hour westerly wind blowing across the Adriatic Sea." I have consulted every IBM and Univac manual on assembler languages and can find no supporting evidence for your answer.

Again, in response to an historical question addressed to you some months ago, you wrote, "Dr. Herman Hollerith and Charles Babbage did, indeed, collaborate on the invention of the Mark I." That statement has been branded as idiotic by every accepted authority on the history of computing.

I cannot rid myself of the nagging thought that you are a fraud.

Ms. Tess D'Urber of Villa Nova

Dear Ms. D'Urber,

I am and always have been just an old teacher doing his duty. Although at times my answers appear to be "off the beaten path," you must remember that these are the answers of a visionary.

Still Your Friend,
Computer Answerman

About the Author

Jim Van Speybroeck is an adjunct associate professor at St. Ambrose College, Davenport, Iowa. He has taught college-level computer programming courses for the past nine years and prior to that was assistant vice-president in charge of DP for the State Bank of East Moline, Ill.

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SPECIAL**REPORT**

Micros in Big Business Opening the DP Window

Edited by Susan Blakeney and Tom Henkel

March 28, 1983

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Micro Market Going Full Steam Ahead; IDC

By Susan Blakeney
CW Staff

	Inst. Base 1980	Ship 1981	Inst. Base 1981	Ship 1982	Inst. Base 1982	Ship 1983	Inst. Base 1983	Ship 1984	Inst. Base 1984	Ship 1985	Inst. Base 1985	Ship 1986	Inst. Base 1986
UNITED STATES													
Business/Professional	1,066.5	1,823.9	2,890.4	2,914.0	5,404.4	5,434.1	10,838.5	8,150.0	18,988.5	10,495.0	29,483.5	12,495.6	41,939.1
Home/Hobby	251.7	143.3	395.0	306.0	701.0	501.6	1,202.6	651.0	1,853.6	747.5	2,601.1	834.6	3,435.7
Scientific	1,037.5	381.3	1,418.8	540.0	1,958.8	627.0	2,585.8	699.2	3,285.0	729.8	4,014.8	731.0	4,745.8
Educational	66.1	86.9	153.0	109.3	262.3	122.4	384.7	134.3	519.0	144.8	663.8	156.3	820.1
TOTAL UNITED STATES	2,421.8	2,435.4	4,857.2	3,869.3	8,326.5	6,685.1	15,011.6	9,634.5	24,646.1	12,077.1	36,723.2	14,217.5	50,940.7
INTERNATIONAL													
Business/Professional	493.4	528.6	1,022.0	877.1	1,899.1	1,297.2	3,196.3	1,867.5	5,063.8	2,411.2	7,475.0	2,967.0	10,442.0
Home/Hobby	95.6	67.3	162.9	118.8	281.7	176.4	458.1	200.9	659.0	250.9	909.9	295.8	1,205.7
Scientific	678.0	314.9	992.9	432.9	1,425.8	506.0	1,931.8	576.3	2,508.1	649.6	3,157.7	710.4	3,868.1
Educational	69.5	57.8	127.3	73.7	201.0	79.0	280.0	84.5	364.5	92.2	456.7	94.5	551.2
TOTAL INTERNATIONAL	1,334.5	970.6	2,305.1	1,502.5	3,807.6	2,058.6	5,866.2	2,729.2	8,595.4	3,403.9	11,999.3	4,067.7	16,067.0
WORLD													
Business/Professional	1,559.9	2,352.5	3,912.4	3,791.1	7,303.5	6,731.3	14,034.8	10,017.5	24,052.3	12,906.2	36,958.5	15,462.6	52,381.1
Home/Hobby	347.3	210.6	557.9	424.8	982.7	678.0	1,660.7	851.9	2,512.6	998.4	3,511.0	1,130.4	4,641.4
Scientific	1,715.5	696.2	2,411.7	972.9	3,384.6	1,133.0	4,517.6	1,275.5	5,793.1	1,379.4	7,172.5	1,441.4	8,613.9
Educational	135.6	144.7	280.3	183.0	463.3	201.4	664.7	218.8	883.5	237.0	1,120.5	250.8	1,371.3
TOTAL WORLD	3,756.3	3,406.0	7,162.3	5,371.8	12,134.1	8,743.7	20,877.8	12,363.7	33,241.5	15,481.0	48,722.5	18,285.2	67,007.7

IDC Chart

Desktop Market Dollar Value Shipment and Installed Base Forecast

They're small, cheap and efficient. With all the appeal of the subcompact car, the microcomputer has burst onto the data processing scene, and at least in number, is taking over. According to a recent report from International Data Corp. (IDC) of Framingham, Mass., the desktop computer market will soar in dollar value from a 1980 U.S. installed base of $1.06 billion up to $41.9 billion by 1986.

With the advent of friendly English-like software and even friendlier price tags, it is hardly a surprise to find former mainframe-only organizations making their way toward microcomputers to relieve DP backlogs, placing more computing power directly into the hands of end users.

While 67% of the IDC survey respondents claimed to have formal policies regarding microcomputer acquisitions in their organizations, 17% said they had only informal guidelines, 6% were not sure of the corporate policy and the remaining 10% said there was no policy or plan whatsoever.

Dangers and Benefits

The IDC study discovered that while management information systems (MIS) departments in large companies recognize "the potential dangers of unchecked growth of personal computers," more importantly, they also see "the potential benefits of personal computer usage."

Furthermore, the study maintained, implementing personal computers across the organization "in many cases requires the MIS department to do substantial front-end work to ensure success." In fact, 70% of those organizations polled will look to MIS to train people on personal computers.

This is not surprising, as MIS logically appears to be the most familiar with the technology as well as with acquisition procedures and existing vendors' offerings. But the exact role of MIS in personal computing implementations varies from organization to organization, according to IDC's findings.

Likewise, the responding companies' major criteria vary widely for personal computers. For instance, vendor visibility was rated as the most important factor in choosing microcomputers, followed by software availability and manufacturer's reputation.

Consistent with these findings were the results of IDC's poll of organizations on which companies provide the best products in terms of business microcomputers: IBM, Apple Computer, Inc. and Tandy Corp. topped the list.

In terms of where microcomputers will be purchased, the vast majority of those surveyed said they would buy directly from the micro manufacturer, followed by retail stores and distributors. In addition, 60% said they wanted to establish special relationships to get volume purchasing price breaks with computer stores. In the same vein, 87% of those polled anticipated an organized and centralized buying process.

Standardization Issues

Other considerations in a company's microcomputer plan include standardization and security issues. IDC found that while "the type of standardization is really up to the individual organization to choose," they must prioritize vendors, operating systems, communications options and even the availability of programming languages.

Inside

Spreadsheets Figure In Micro-Mainframe Link SR/4
Service Bureaus Link Micros to Mainframes SR/5
Micros More Than Ready For Mainframe Shops SR/7
Multiuser Systems Increase Data Base Access SR/8
Connecting Micros To Major Networks SR/15
Execs Access CPU's Data At Home With Micros SR/18
Micro Connection Solves Logjams at Company SR/20
Dolby Meets Demands By Building Micro Net SR/23
... And Here Comes the Corporate Micro Store SR/24
Small Businesses Lucrative Market for Micros SR/30
Minis Weave Elaborate Net Over Texas Campus SR/35
Managing the Move To Distributed Processing ...SR/37
Formal Micro System Ties Sales Offices to Net SR/39
Micro Installation Requires Planning SR/41
Micro Integration Can Prove Awkward Task SR/42
Moving Micros to Business Only Half the Battle SR/47
Integrated Net Allows S&L Group to Expand SR/48
Micros Relieve CPUs' Work Load at College SR/49
Unix Offers Alternative For Business Micros SR/51
DBMS Provide Checks For Distributed Micros SR/52
Desktop Systems Offer Viable Business Solution SR/55
Insurance Agents Take Micros 'On the Road' SR/58
Is Micro Migration Causing Data Base Mayhem? SR/61
Architectural Firm Designs Its Own Micro Net SR/63

Predicts Installed Base of $41.9 Billion by '86

	Number of Responses
Vendor Viability	14
Software	12
Manufacturer's Reputation	7
Maintenance	5
Price	4
Communications	4
Reliability	3
Compatibility	2
Other	9
Not Sure	4

Selection Criteria for Personal Computers at Respondent Companies

	Number of Responses
IBM	23
Apple	18
Tandy	6
Digital Equipment Corporation	5
Hewlett Packard	3
Wang	2
Burroughs	2
Others	5
Not Sure	4

IDC Charts

Vendors That Respondents Think Offer the Best Solution

Next, the software question must be tackled: whether to go the route of packaged, self-developed software or MIS-developed software. Of 50 people surveyed, IDC found 29 who purchased microcomputer software right off the shelf, 21 people whose software was end-user-developed and 10 who received the software from MIS.

Asked whether microcomputer infiltration will affect data security, a whopping 64% said yes, 33% disagreed and 3% were unsure. In 80% of the organizations polled, personal computers should be able to access the mainframe and/or company data base.

All respondents were asked if they felt personal computers are or would be replacing traditional online IBM 3270-type terminals. Sixty percent agreed that while this change would not take place overnight, it would eventually come to pass. The vast range of applications available to personal computers seems to give weight to this theory; the microcomputer is more versatile than the dumb terminal — not to mention the fact that it costs less.

Finally, just what impact will personal computers have on DP's backlog of applications? Seventy percent of those surveyed indicated that the effect will be positive. In addition, the respondents described four potential scenarios:

- Users waiting for applications develop them themselves on personal computers.
- MIS develops these applications in less extensive form for the personal computer.
- Personal computers have no immediate impact, but future demand is lessened as users do more for themselves.
- The personal computers have no effect, as the applications that are automated by them would have been done manually and never on the mainframe.

Despite the last somewhat depressing scenario, the IDC report concluded on a positive note.

	Number of Responses	Percent
Word Processing	84	17.9%
Financial Analysis	70	15.0%
Accounting	61	13.0%
Education	61	13.0%
Engineering/Scientific	48	10.2%
Personal Record Keeping	29	6.2%
Data Base Terminal	25	5.3%
Manufacturing	12	2.6%
Graphics	8	1.7%
Games	7	1.5%
Payroll/Personnel	5	1.1%
Taxes	3	0.6%
Other	52	11.1%
TOTAL	469	100.0%

Total by Primary Application of Personal Computer

Some Advice for DP Managers on Micro Integration

By Edwin G. McMullen
Special to CW‡

The addition of microcomputers to a company's data processing operation has many implications. While micros certainly have the potential to improve productivity, they can also strike terror into the hearts of many senior DP managers who support the idea of centralized computing. The following summarizes some issues affecting the integration of micros into larger processing systems and suggests possible solutions.

Perhaps the most glaring problem is equipment standardization. There are more than 75 personal computers on the market today. If user departments are allowed to select among these without constraint, internal chaos will result from a mix of operating systems, languages, systems nuances, duplicate or multiple consumable supplies, keyboard layouts, training needs, spacing and maintenance.

The solution is to create a corporate selection standard based on how easily a given processor can be integrated into in-house computer systems and networks.

Software transportability is another issue. Major problems are going to arise over software ownership now that more non-DP professionals are writing their own programs. The best and perhaps only way to solve this problem is to establish firm guidelines governing operating systems, languages, applications, documentation requirements and compatibility with the existing in-house system.

The software issue is enormously complex, but rules developed early on in the system's integration process may at least reduce problems.

Data extraction is another sticky issue. When microcomputers interact with mainframes, there is a potential for many problems. The integrity of data, data structures, currency and validity are just a few potential problem areas. In some cases, the micro will be used in two distinct ways, such as an IBM Personal Computer offering local intelligence plus the ability to be used as an IBM 3270-type dumb terminal.

One solution is to provide microcomputer users with downloaded copies of data base information while maintaining strict control over direct access to mainframe processors. This method can be accomplished by restricting the number of people who can use the device as a dumb terminal. It offers added protection to the mainframe and avoids the potential chaos of unrestricted data extraction and input to central files.

In order to integrate micros into larger systems effectively, communications line efficiency is a must. A major cost and error factor in networks today is an overly complex network with too many lines. Some networks have everything from twisted pairs to coaxial cables, modems, multiplexers, front-end attachments and communications software. All these things can be the source of downtime, lower response time and overall inefficiency.

When implementing a microcomputer network, one should insist that micros use existing lines, front-end facilities and access methods. This will immediately save time, worry, disruption and failures.

The method of acquiring microcomputers is another important consideration. If a company buys the micros, it may lose out on a whole generation of newer processors, languages and peripherals. Few suppliers, however, will lease micros. The solution is to establish internal standards on whether to buy, rent or lease micros. Such a standard will help sort out undercapitalized local vendors and dealers as well as strengthen the firm's ability to move

(Continued on SR/4)

Ease Access to Corporate Data Bases

Spreadsheets Figure in Micro-Mainframe Link

By David Needle
Special to CW‡

Corporate microcomputer users want the vast wealth of information stored in their company's mainframe computers. And they want the DP department to help them get it.

Even DP managers who have staunchly resisted the idea of incorporating microcomputers into their firm's DP operations are being asked to provide mainframe data to micro users — often users who independently purchased micros to gain "freedom from the management information systems [MIS] department," according to Barry Passen, president of Microcon Software Center, a microcomputer retail outlet.

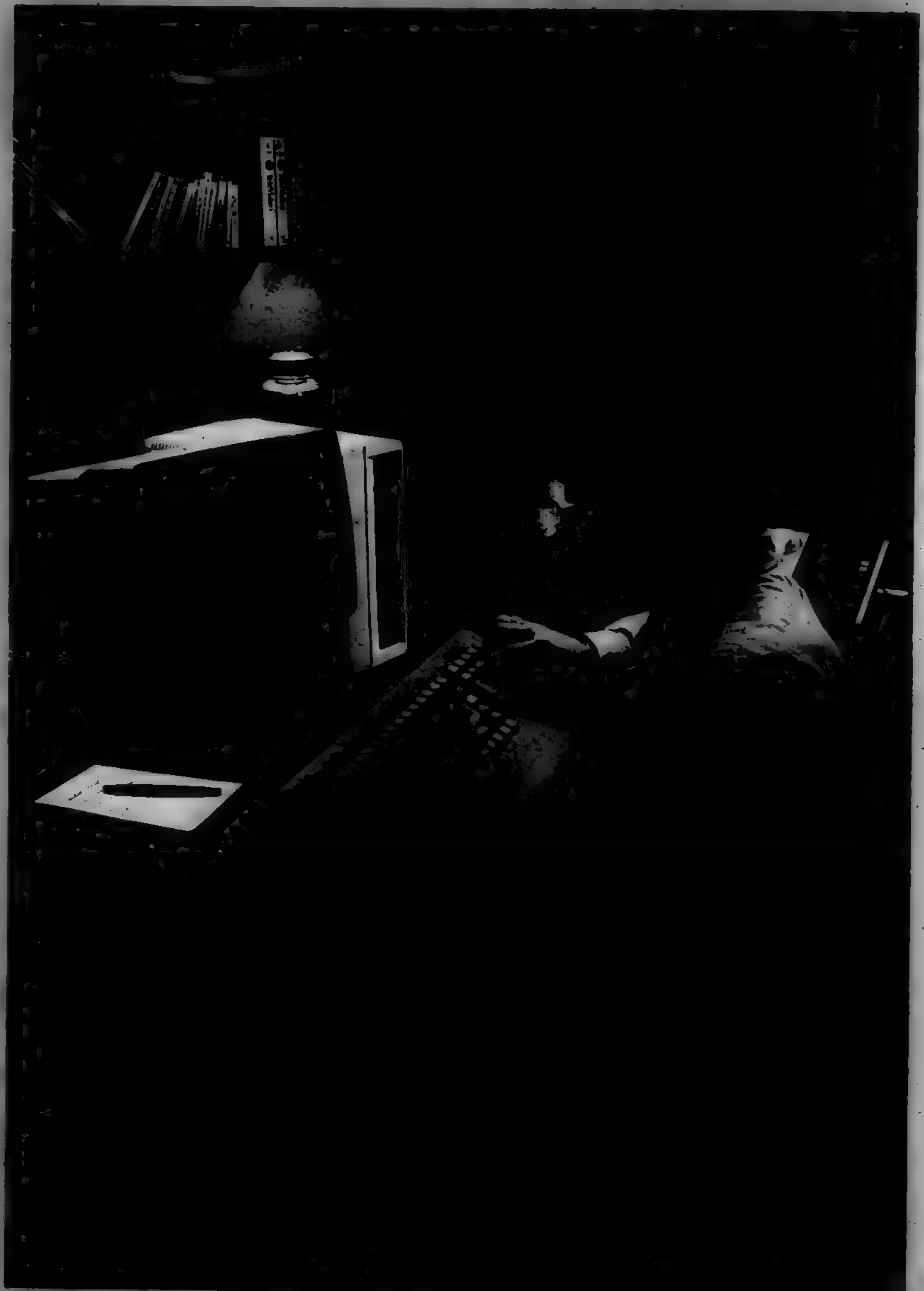
"There is a tremendous surge in departmentalized data processing and less reluctance among MIS managers to endorse micros," Passen said, noting that some DPers have simply realized that, for better or for worse, micros have become a fact of life.

"MIS departments can't respond quickly enough to the market [for microcomputer applications] that's evolved in the past year," noted Aaron Goldberg, a research analyst with International Data Corp.

Rather than resist the idea of opening up corporate data bases to micro users, Passen said many DPers are trying to make it easier for micro users to gain access to the host processor's data. One way of doing this is to develop the protocols and interfaces necessary to use the host processor's data in one of the many electronic spreadsheet or financial modeling programs currently available on the market.

A spreadsheet program transforms the computer into a giant electronic ledger sheet, allowing the user to work with a number of interrelated values such as inventory, payroll and sales. The user can change any of the

(Continued on SR/6)



Integration Of Micros

(Continued from SR/3)

quickly with minor economic impact.

Service support is another issue that must be resolved. Broken micros and peripherals must be repaired. Some organizations work out service arrangements with local dealers while many have an on-site repair service. The best arrangement depends on the company's size and how critical the system is to the overall operation.

Last of all, it must be determined who will purchase the microcomputers. Since they are relatively inexpensive, micros often fall outside the usual data processing equipment purchasing guidelines.

A potential problem exists when senior executives authorize microcomputer purchases for various departments. Aside from the obvious problem of buying systems that are incompatible with overall company plans, the company can lose money by not choosing to make bulk microcomputer purchases.

One solution is to create a central committee to approve microcomputer purchases. Another solution is to consider microcomputer purchases as a subset of the overall data processing configuration.

McMullen is vice-president of planning for Lee Data Corp.

Alternative to In-House Systems

Service Bureaus Link Micros to Mainframes

By Tom Henkel
CW Staff

Not all microcomputer links to mainframes are carried out through in-house systems. At least three service bureaus have announced services that offer microcomputer users access to data stored in mainframe data bases.

Control Data Corp., for example, is currently working with an in-house experiment linking the firm's 110 microcomputer to its Cybernet time-sharing network. While currently offered to six CDC offices, a spokesman said that the experimental program will be expanded to include more CDC offices and may eventually lead to a commercial product linking various micros to Cybernet.

Comshare, Inc. recently announced a management-oriented decision support tool called Distributed W that allows users of IBM's Personal Computer or Apple Computer, Inc.'s Apple II processors to access either in-house mainframes or Comshare's time-sharing network. In both cases, Distributed W provides a syntactically compatible microcomputer environment for data base mainframes running IBM's VM/CMS operating system, the firm said.

A smaller service bureau, Systems Analysis, Inc. in Bellevue, Wash., recently began offering a microcomputer link to its Burroughs Corp. mainframes using terminals based on Digital Research, Inc.'s CP/M and manufactured by ECS Microsystems, Inc.

The implication, some industry watchers contend, is that companies may be able to bypass the problems associated with connecting micros to in-house processing systems by using data bases and software offered by time-sharing services.

The CDC experiment, for example, is being used to transfer personnel data from 100 CDC field offices to the firm's Minneapolis-based headquarters. According to Rachel Townsend, manager of the project, a special software package called Cybernet Connect was developed to allow microcomputer files to be transferred to Cybernet.

Editing Advantage

The CDC 110 microcomputers replace terminals and tape cassettes previously used to enter personnel data. The advantage, Townsend said, is data entry personnel can now edit data. Before installing the micros, the host processor had to do all the editing, making data correction difficult, he explained.

Data transmitted from the field to headquarters moves at 1,200 char./sec over asynchronous telephone lines with full error checking and correction. Currently installed in six CDC branch offices, CDC plans to expand the program within the next 18 months to include 100 field offices, Townsend said.

One user of Comshare's Distributed W, Bank One of Columbus, Ohio, is using the package to perform financial modeling.

"Micro modeling is perfect for the development phase of business planning where we tend to do a lot of testing that can tax mainframe resources. But with many of our complex banking models, we must go beyond the two-dimensional outline afforded by micro systems. That's where the ability to communicate with a multidimensional product is helpful," according to Car-

(*Continued on SR/8*)

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Spreadsheets Provide Link to Corporate Data

(Continued from SR/4)

values on the spreadsheet, and the program will automatically recalculate all the other values. Such recalculations would take hours if done by hand; with an electronic spreadsheet, the time to perform these "what if" tasks is reduced to seconds.

"In a sense [downloading corporate data bases] doesn't depend on the micro being used, but on the terminal program written by a DP manager," commented Jack McGrath, editor of *SATN*, a technical journal for users of Visicorp's spreadsheet package, Visicalc.

Some companies have developed standard interface formats to accept mainframe data and merge it with a Visicalc file. Software Arts, Inc., which wrote the Visicalc program for Visicorp, offers a free-formatting program called DIF.

But employing the DIF format is not something the unsophisticated or nontechnical user would find convenient to do, according to Dr. Scott Cutler, manager of video systems at General Electric Co.'s research and development facility.

"Right now it's easier for us to get a printout [from a mainframe] and type the information into a micro" than to go through all the steps necessary to download the information to a micro and manipulate the data onto a spreadsheet, Cutler explained. What is really needed, he said, is a program that lets the user automatically download data to a micro with a simple command.

"A lot still needs to be done," Cutler noted. "There are more single unconnected micros [in large organizations] than advisable."

While electronic spreadsheet programs were not designed exclusively to access a mainframe, the large number of spreadsheet programs in use makes them an ideal choice for incorporating mainframe data into the micro environment. Datapro Research Corp., for example, predicts that more than a million spreadsheet programs will be in use by the end of 1983. That estimate includes the dozens of Visicalc-like programs that have come out since Visicalc was first introduced in 1978. Some of those programs offer enhancements to the original Visicalc and support varying operating environments.

In addition, newer, so-called "integrated packages" may overtake the spreadsheet and other stand-alone application packages in the business and professional marketplace.

With stand-alone packages, users wanting to do more than one application on their personal computers are often limited by inconveniences such as having to swap disks and remembering different commands because the user interface is rarely identical between different packages. They may also have to go through the relatively time-consuming process of integrating different kinds of data onto one document, such as spreadsheet data onto a graph, noted Mitchell Kapor, president of Lotus Development Corp. (LDC) in Cambridge, Mass.

LDC's integrated package, 1-2-3, uses the same command structure for all of its applications and allows the user to manipulate text, graphics and/or data onto one document or screen if desired.

A similarly integrated package called MBA is available from Context Management Systems. Apple Computer, Inc.'s recently announced sophisticated workstation, called Lisa, also includes a number of different application programs in an integrated format.

Needle is East Coast editor for InfoWorld, *a weekly newspaper for microcomputer users.*

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3.

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Programmer Aids Abound

Micros More Than Ready for Mainframe Shops

By Max A. Lebow
Special to CW‡

Only a few years ago it would have seemed foolish to suggest that a mainframe shop, housing literally megabytes of main memory and executing millions of instructions per second, might need and use microcomputers and their applications software. Programming for the first S-100 microcomputers before the advent of well-tested microcomputer operating systems was the pastime of avid hobbyists and experimenters only.

When the S-100 did what was required, the programmer gave a triumphant whoop and a long sigh and then usually returned to the kitchen table to write additional subroutines in assembler language that would make the machine easier to program.

Today, programmer aids for microcomputers run the gamut from symbolic assemblers and cross-reference utilities for higher level languages to full-blown application generators. Furthermore, the best of these microcomputer applications would make the boys in the DP shop proud — if they were not so afraid the little machines were going to cost them their loyal customers — and their jobs.

Three Categories

Microcomputer software designed for use in mainframe shops basically falls into three broad categories:

- Software that performs housekeeping and management functions for the DP center (such as project management or project costing for software development) and does not require the full computing power of a mainframe.
- Communications software that allows the microcomputer to function as a terminal of the mainframe system.
- Applications that replace minor end-user functions (such as departmental budget projections or reports) and do not require the capabilities of a mainframe.

Before introducing a microcomputer and its software into a mainframe shop, several technical and managerial issues should be considered that will help ensure a smooth operation. Since the issues are somewhat different for each category of use, what follows is a more detailed description of the category, examples of packages available to fulfill that function and a discussion of the issues to be considered.

- *Housekeeping and Management Functions.* This is a relatively new application area for the microcomputer, and there are only a few packages available. Examples include Estimacs from Management and Computer Services, Inc.; Slim from Quantitative Software Management, Inc.; and Information from Informatics General Corp.

The first two products help mainframe software developers plan and execute complex programming projects. Slim has been in use for about four years, mainly in large commercial and government installations. It runs on the Hewlett-Packard Co. HP 85. Estimacs was introduced in September 1982. At that time it had about 100 users among half-a-dozen corporate clients.

Although they share the same overall purpose, Slim and Estimacs differ in their approach to software planning and cost estimation. Slim uses the Program Evalu-

(Continued on SR/12)

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Demand Growing Among Users

Multiuser Systems Increase Data Base Access

By Lew Gaiter III
Special to CW

The great interest in applying microcomputer systems to business and professional settings has been a significant element in the explosive sales of so-called personal computers. This phenomenon has been accompanied by a somewhat slower, but nonetheless growing, realization that in most business or professional applications, a single-user configuration, while helpful, soon reveals inadequacies.

Prominent among these deficiencies are the problems that arise with the installation of a second or third microcomputer in the same setting. Information is not accessible in a way that takes full advantage of the computer's capabilities. Files of presumably identical data age at different rates and require updating periodically.

Subsequently, many microcomputer users have begun to feel a need to link free-standing, single-user computers to assure easy access to a common data base.

With the introduction of data base management systems, increasingly powerful microprocessors and better insight into the potential of computers, more and more users are calling for multiuser systems.

A number of manufacturers have recognized this growing demand, and a number of such systems are currently available on the marketplace. As more manufacturers enter the market, a greater range of choices between technologies, hardware configurations and software capabilities can be expected.

A multiuser system is a computer system that allows more than one user or user program to access the same data base of information or peripherals simultaneously. This type of system allows several users simultaneous access to the same disk, printer or communications capability between separate processors or tasks.

A practical application for a multiuser system can be illustrated by what happens when two people use an accounting package on the same computer. While one user works in a general ledger program, the other processes information or data in the accounts receivable program. Both are able to access the same information, that is, an invoice, as well as communicate with one another on a particular section of the program being used.

> *'Scheduling is the first step in the development of . . . multiuser systems. Scheduling is the method used by the CPU to decide which task it will execute first and how much time it will allot for the execution of that task.'*

Several techniques are used to accomplish this goal.

Two of the most popular types of multiuser systems on the market are the single processor time-sharing system and the networking system.

A single processor time-sharing system utilizes only one CPU to process several tasks or programs for various users.

Each task receives a specific amount of time — a time slice — for processing. A task resides either in a certain portion of shared memory or, alternatively, on the disk and the CPU time slices between tasks. In this fashion, tasks are completed one at a time.

The networking system links several single-user systems together through a communications interface. These systems communicate with each other either over a coaxial or over another type of cable that enables very high-speed data transfer between processors. This approach allows more than one user to access the same data base and provides the capability to utilize data located at physically separate locations.

The multiprocessor system generally uses a high-speed bus to tie several users or processors together. It contains one processor that is known as the system manager or the master CPU. This is a stand-alone CPU whose function is to handle most of the mass storage, resource communications and all printer and bus communications. Any users wishing to communicate across the bus or access any mass storage or printers must communicate through the master CPU.

In order to obtain a computer that meets the needs of the market, several things must be considered when designing a multiuser system, such as processor size and speed and hardware/software compatibility.

Suggested here are a few brief design proposals for each of the single processor time-sharing, networking and multiprocessor systems.

Scheduling is the first step in the development of this approach to multiuser systems. Scheduling is the method used by the CPU to decide which task it will execute first and how much time it will allot for the execution of that task.

One method of deciding how much CPU time will be set aside for a given task is to have some type of interrupt occur at a constant interval. The time between two such interrupts is called a time slice, while the interrupts themselves are called ticks. Each task is assigned a certain

(Continued on SR/10)

Bureaus Offer Micro, CPU Link

(Continued from SR/5)

ol Fidler, Bank One's financial administrator and financial planner.

Systems Analysis, Inc.'s service is aimed primarily at small banks that use the firm's Burroughs mainframe to perform a variety of banking functions, according to Dean Sutton, vice-president and DP director at Systems Analysis.

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As Demand and Complexity Increase

Few Standards Available in Micro Market

By Rod Canion
Special To CW‡

As data processing managers confront the problem of deciding which personal computer they should use, many are finding the choices more limited than they expected. Even with several hundred kinds of personal computers on the market today, very few meet the exacting and unique demands of the corporate environment. Those that do are rapidly setting standards in the marketplace for users and vendors alike.

Before IBM announced its 16-bit IBM Personal Computer in August 1981, executives and managers had already started acquiring home computers and adapting them for a variety of specific business uses. Often, individuals discovered how much time could be saved by using Visicorp's Visicalc or one of the other spreadsheet programs. Others discovered the benefits of word processing.

Because they were confined to the first generation of 8-bit personal computers, some users quickly ran up against the limited storage and computational capabilities of their machines. Those who looked forward to the day when they could integrate their personal computers into the larger corporate DP environment were quickly disappointed.

Ill-Equipped for Survival

For several reasons, 8-bit personal computers were ill-equipped for survival in the world of big business. Among other things, the corporate world demands power, functionality, expandability, availability of software for a wide variety of business applications and ergonomic features such as ease of use, a readable display and attractive styling. Unfortunately, most 8-bit machines failed to satisfy one or more of these critical requirements. The IBM Personal Computer and a limited number of pacesetters in the 16-bit generation, on the other hand, have pushed the limits on these requirements to a new level and have raised users' expectations.

The new generation of business software requires more memory and computing capabilities than the first-generation machines could provide. Many packages require a minimum of 128K bytes of random-access memory and are capable of handling more data stored on double-sided floppy disks and Winchesters than the 8-bit machines.

These second-generation software packages for 16-bit machines also provide greatly enhanced capabilities that make personal computers useful for whole new classes of business people. For example, innovative products, such as Software Arts, Inc.'s TK1Solver and Lotus Development Corp.'s 1-2-3, run only on 16-bit machines. And they are primarily developed to run on the IBM Personal Computer.

Just as important as computing capability is the ability of the hardware to grow along with the user's maturing DP needs. Because the new generation of hardware is capable of a sometimes surprising degree of expansion, it is the first equipment that is truly useful on a broad scale in large-company settings.

It is becoming increasingly easy to integrate these machines into local-area networks, to set up sophisticated, but simple links with mainframe data bases and to work with advanced modeling and forecasting programs that require extensive color graphics capabilities.

Because the second-generation hardware fits so well into the corporate environment, more business packages are being produced to meet an insatiable demand for new business applications. And so far, most of that new software is being written for the IBM Personal Computer.

Because IBM is already a strong influence in the market and its personal computer is so well-suited to the large-company environment, most of the second-generation software has been developed for the IBM machine.

So much software has been developed for the IBM microcomputer that it is rapidly setting the hardware and software standard for business and professional users of second-generation personal computers. Moreover, that standard is rapidly taking on a life of its own, independent of IBM. Today, virtually every important business application program is available for use with the IBM Personal Computer.

It is no surprise, then, that a number of vendors have introduced personal computers that are to varying

(Continued on SR/14)

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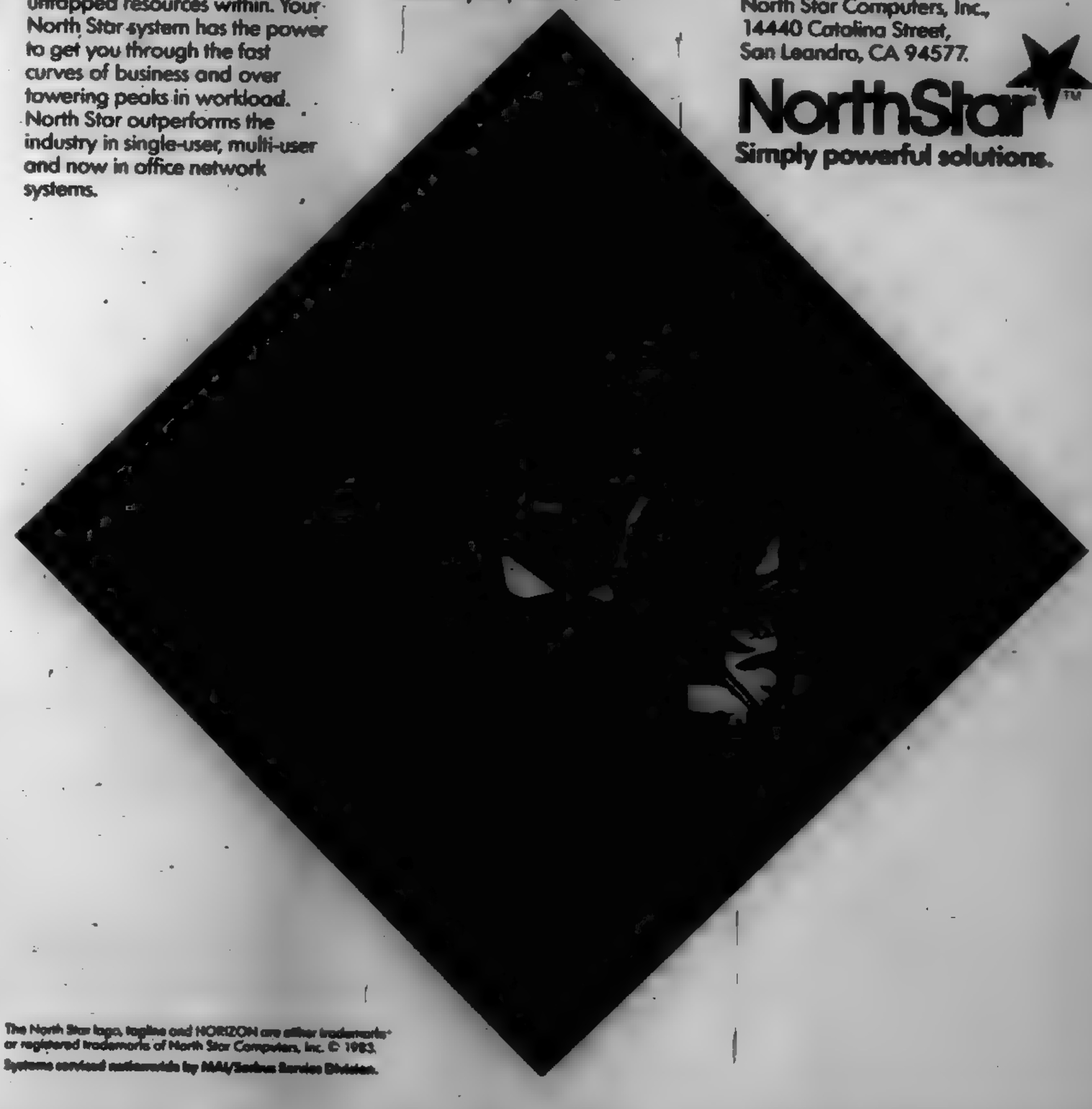

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Multiuser Systems Fill Data Base Access Needs

(Continued from SR/8)

number of ticks for its execution, after which it must give up the system and let another task run.

In designing a scheduler, the priorities of specific tasks need to be considered. A user requesting file information is not considered to be performing a high-priority task. Therefore, the user does not require a large number of ticks.

However, the buffering and disk systems are high-priority tasks, justifying more ticks and a longer time slice for their completion. These tasks need a high-priority rating to keep from being rolled out because of some low-priority task, such as reading a file record.

There is more than one way to ensure that high-priority tasks get either a longer time slice or a higher number of ticks. The currently popular design solution provides for each task to receive a certain amount of time, for example, 1 to 4 msec, to access the processor.

Immediately after rollout, high-priority tasks are placed at the front of the task queue and are reexecuted after they roll out. This means that high-priority tasks receive several sequential time slices. Even though this is sufficient for the need, this is not the most efficient design approach.

Alternative Approach

A variable interrupt timer is an alternative approach to the design mentioned above. It allows higher priority tasks or routines a longer time slice to finish a task before being rolled out.

For example, a routine requiring 3 msec to finish might be assigned a single 4-msec time slice instead of three 1-msec time slices and would not roll out until it was finished.

Thus, the actual time required to finish the task would be 3 msec instead of 3 msec plus the scheduler processing time.

Memory management routines are a must in a time-sharing system. These routines decide which task resides in a specific part of memory and how to swap tasks in and out to disk.

These routines also provide a shared space for user-to-user or intertask communication and keep the users' programs from getting confused.

The memory management system must be a finely timed combination of efficient hardware and software. Information about the total memory size needed by the program, as well as where and how these memory requirements may be segmented, needs to be included with each task.

In this manner, the scheduler is provided with sufficient information to keep intertask collisions from occurring. Having the memory management scheme and the devices access the same CPU allows accurate task communications to keep user tasks straight and helps to avoid confusion between user tasks.

The communications buffers are important parts of the memory management system. These buffers transfer information from task to task. This information is then placed in the intertask communications area, and the buffering system is called.

From this point, the buffering system looks for that sector in a disk buffer, and if it is there, the information that is in the buffer is transferred to the file system.

If the requested sector is not in a disk buffer, the information is placed in the intertask communications area and then the disk system is called to move the requested information into a disk buffer.

In a multiuser networking

(Continued on SR/11)

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Multiuser Systems Need Fail-Safe Data Security

As with any useful tool, multiuser systems have certain disadvantages that must be taken into consideration along with their advantages.

Some of these disadvantages include the need to provide some form of data security, a tendency in some configurations for reduction in speed as the number of users increases and a necessity for a fail-safe mechanism to prevent the errors of one user from negatively affecting the entire system.

Interference Protection

In the area of data security, the user of an applications program needs to be assured that data placed into the system is protected from interference or unauthorized access. This includes, but is not limited to, a need for some form of record and file locking, a mechanism that prevents more than one user from accessing the same point in a file accidentally.

One such safeguard assigns an account for each user on the system. This makes it possible to store and protect any sensitive data or information from unauthorized tampering.

The problem of reductions in system speed is usually resolved by buffering mass storage data transfer requests. This method improves system response times by allowing multiple users to access the same data with a minimum amount of mass storage activity.

On the multiprocessor and network multiuser integrations, speed degradation is not a serious concern since each user has a separate CPU that allows individual processor-dependent tasks to run as fast as they would on a conventional single-user system.

Multiuser systems are normally very stable. With the multiprocessor implementation, reliability is enhanced since it is possible for one user to fail without disturbing the rest of the system.

User Access Increased

(Continued from SR/10)

computer system design, a number of independent computers are linked together through some type of cable that acts as a communications bus. There is only one CPU used in accomplishing any given task.

Each user has a CPU, disk storage and file system. Assuming there are six users, a networking system would contain six CPUs, six disk storage units and six individual file systems.

Any of these six users can communicate with any of the other five users. It is obvious there is mass replication of resources with this kind of system.

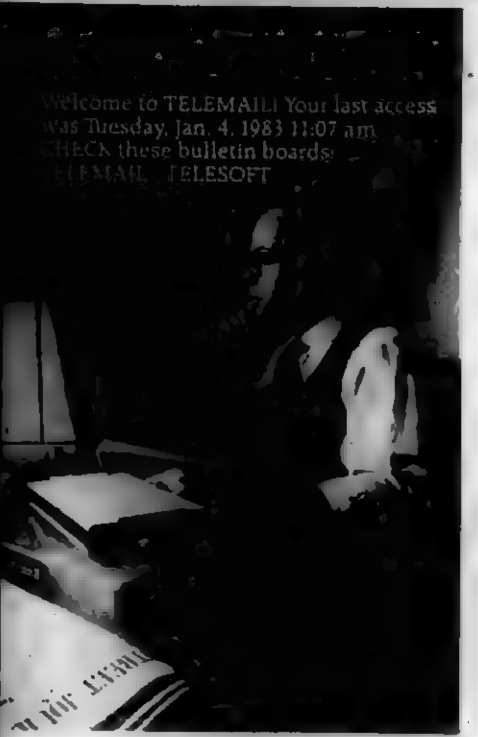
Each user runs independently in a manner that allows any user to interrupt any other user. Interrupts and multitasking are used for system efficiency. They are also used to help keep individual CPUs from locking up.

The advantage of a networking system is that one CPU is able to access a multitude of data bases while running programs specific to that particular user.

The greatest disadvantage of the networking system is the mass replication of I/O resources and many other components of the system.

Furthermore, it would be economically and operationally more advantageous to have one disk, one file system and one master to handle these functions.

Gaiter is a former software engineer at OSM Computer Corp., located in Santa Clara, Calif.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Dialing Capability: Touch-Tone and rotary-dial pulse dialing.
Commands: (unnecessary with Smartcom II software) A: Immediate answer. A/ Repeat last command. C: Transmitter Carrier. D: Dial command, including simple dialing, waiting for second dial tone, auto-dialing and other features. E: Local echo. F: Full/half duplex. H: Switch hook. M: Audio monitor. O: On-Line. P: Pulse dialing. Q: Quiet mode. R: Reverse originate/answer. S: 17 "Set" commands allow user to select various operational parameters, such as dialing speed, escape code character, number of rings to answer on, etc. S?: Checks operational parameters above. T: Touch-Tone dialing. V: Verbose result codes.
Result Codes: (can be numerical/verbose) 0/OK: Command line ok. 1/Connect: Carrier detected. 2/Ring: Phone is ringing. 3/No Carrier: Carrier lost or never heard. 4/Error: Error in command line. 5/Connect 1200: Carrier detected at 1200 bps. (For Smartmodem 1200 only.)
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Micros Ready to Challenge Mainframe Shops

(Continued from SR/7)

ation and Review Technology methodology for project management and implements a model of the software life cycle using linear programming and simulation. Estimacs uses the decision support approach to generate alternate estimates refined through "what-if" analysis of design trade-offs. Both systems are based on extensive data gathered from actual software project implementations.

Vector Graphic, Inc.'s Milestone project planning package can also be used to plan software projects. It is much cheaper than Slim or Estimacs, but lacks their software-development-specific data bases.

The specification of Informatics's data base management system Mark IV reports is one particular task in many mainframe shops for which microcomputer applications software is now available. The software for this is presently bundled into a system that Informatics calls Informaticom. This package also includes software for transferring files from the mainframe to the microcomputer and back again.

Informaticom leads the user through the process of entering information required for the various Mark IV report specification forms. File description information required to fill out some of these forms can be called up to the microcomputer screen to help with the specification process.

Before housekeeping/management applications are installed, several issues ought to be addressed. Does the microcomputer have the capacity to handle the number of activities involved in managing the project? Are the data bases used in the estimates still current? Does the data reflect recent developments in applications generators and other programming tools? Can the microcomputer process the information required in the timely fashion necessary for prompt implementation of management policies? Is the data required to plan or estimate the cost of a project already stored somewhere in the mainframe file system? If so, can the information be conveniently transferred in a form usable by the microcomputer application?

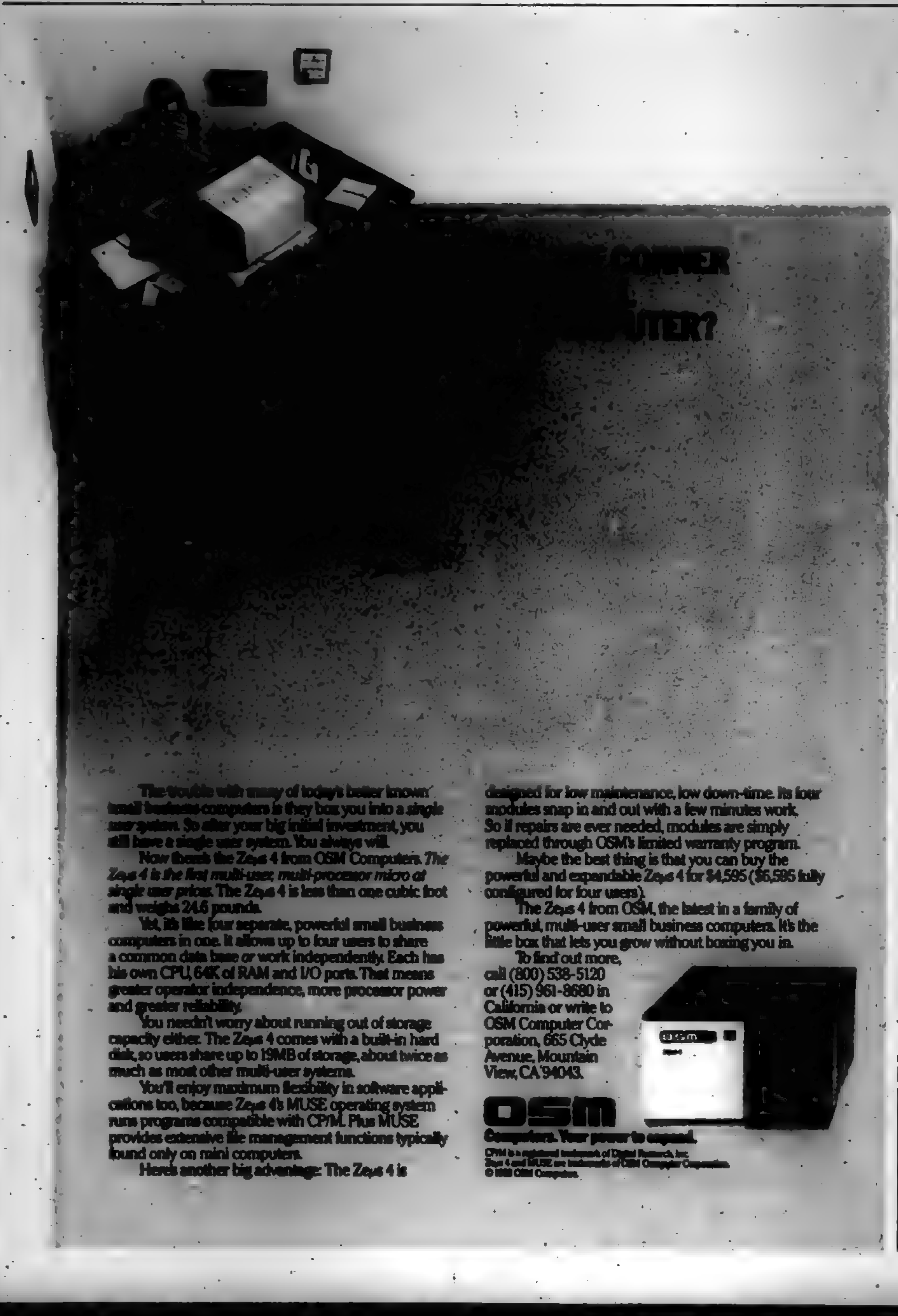
Once these technical questions are answered satisfactorily and the system is installed, personnel issues may arise. Will veteran DP personnel accept information from a microcomputer? Will the microcomputer be seen as a double villain, taking work from mainframe programmers and setting unrealistic work quotas for them?

- *Communications Functions.* Communications software for emulating a remote terminal exists for most of the major microcomputers. These are the programs that allow home computer users to connect to various network services. Also in this functional category are local-mode terminal emulators.

Generally speaking, communications software for microcomputers is becoming more elaborate. Recently released products in this category include Management Science America, Inc.'s Peachlink and Orion Research, Inc.'s Interface/34. One step beyond this is an interface package allowing transfer of data from Data Resources, Inc.'s statistical files to microcomputers running Visicorp's Visicalc.

Issues that should be considered before bringing communications software in-house concern the user interface and the compatibility of the microcomputer with the mainframe. Will the software allow the host and microcomputer to perform as an efficient host-terminal pair? Does the microcomput-

(Continued on SR/14)



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To our Computerworld readers;

The Special Report on Micros in Big Business you're reading now is another part of the expanded coverage Computerworld has been giving to Micros over the last year or two. This expanded coverage reflects the increasing involvement of Computerworld DP/MIS readers with microcomputers on the job.

Research from International Data Corporation, the country's largest computer industry research firm, shows that large computer-using organizations are using more and more micros in their companies. This research is borne out in an annual reader profile study conducted by the Computerworld Market Research Department. This study shows that more than half of Computerworld subscribers are personally involved in the purchase process of microcomputer equipment and software for their organizations or the organizations for which they are consulting.

Since Computerworld's goal is to serve its readers with all the information they need to do their jobs better, Computerworld's editorial coverage has expanded to meet this ever-increasing interest and involvement of DP/MIS professionals with micros and micro software. And our Market Research Department tells me that Computerworld subscribers prefer the micro coverage they find in Computerworld to the micro coverage available in any other publication serving the DP/MIS field. If you're not a Computerworld subscriber, your subscription to Computerworld can bring this same effective coverage directly to you, fresh each week.

Best regards,

W. Walter Boyd

W. Walter Boyd
President

Computerworld
375 Cochituate Road, Box 880/Framingham, MA 01701/(617) 879-0700

Standards Are a Problem in the Micro Market

(Continued from SR/9)

degrees compatible with the IBM Personal Computer. These second-generation systems, however, must satisfy another set of needs in order to be widely accepted in the corporate environment. They must meet significantly higher levels of expectations from nontechnical business and professional users than from the more forgiving hobbyists or do-it-yourself programmers of the past.

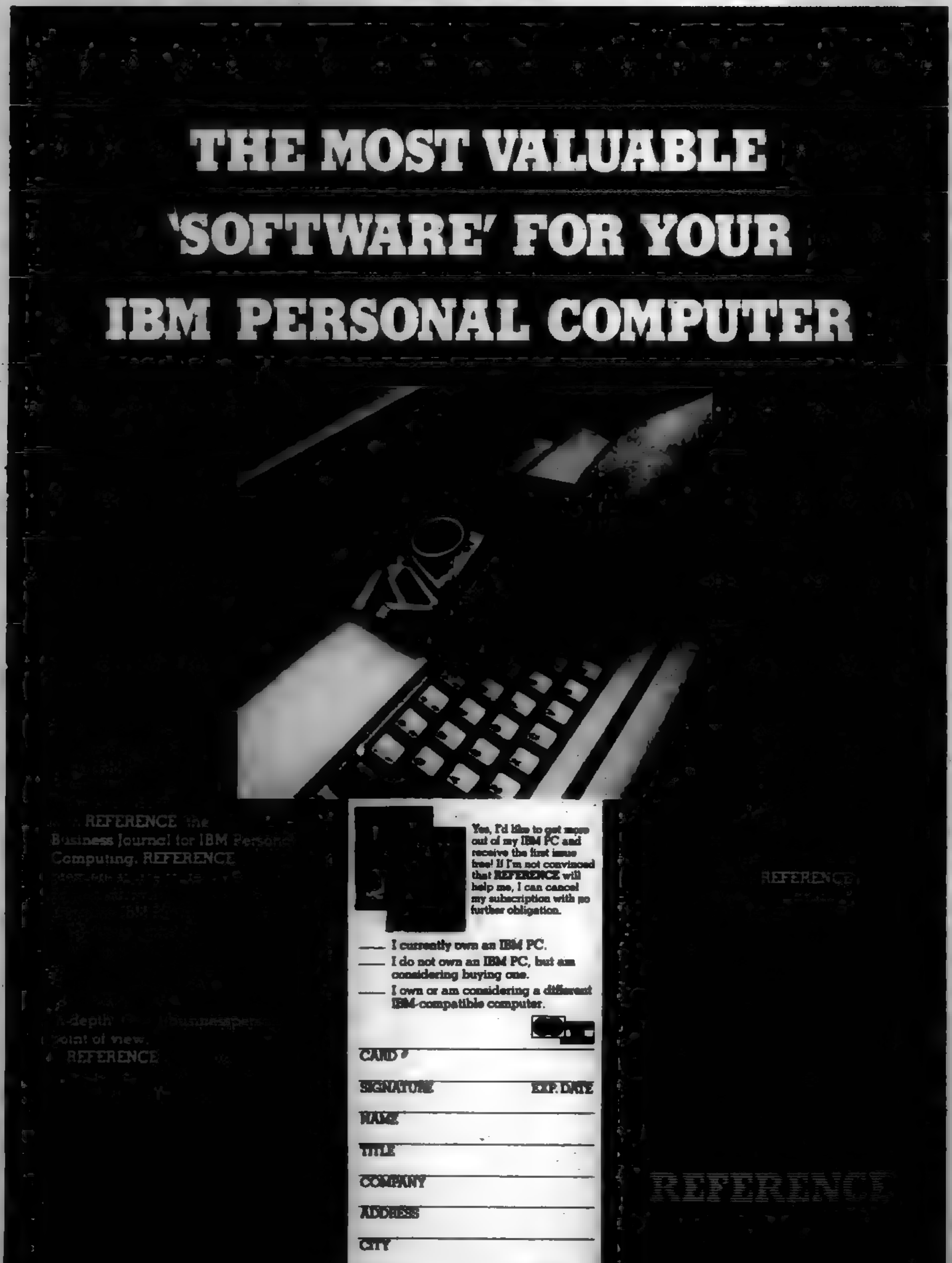
Business users — whose only previous contact with video display terminals was with their color television sets — demand high-quality, high-restoration displays. They expect graphics display capabilities along with high-resolution, uppercase and lowercase alphanumeric character sets.

These new users expect programs to be extremely fast and to work interactively. They also expect programs to be designed for nontechnical users, with plain English commands and extensive Help facilities — all of which require the increased memory and processing power available in the IBM Personal Computer and some of the other 16-bit, second-generation machines.

Many also expect to be able to integrate their systems into local-area networks or into corporate data bases so they can work with common sets of information when analyzing variables of business decisions. Such integration of personal computers into corporate management information systems is not widespread, but it is something the second-generation systems will be capable of supplying.

This rapid acceptance and integration of 16-bit, second-generation personal computers into big corporations has paved the way for a vastly increased number of new users performing thousands of new applications.

Canion is president of Compaq Computer Corp. in Houston.



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Micros Are On the Move

(Continued from SR/12)

er's output produced under the software meet the installation's communications standards? Does the microcomputer have function keys that can be used conveniently to utilize features of the software that call for function keys?

There is at least one important personnel issue that may arise after the system is installed. What proportion of the connect time made possible by the software is actually being spent on the purpose for which the microcomputer and software were intended? Second of all, nonproductive uses of the microcomputer include the running of game software, the connection to network services other than those intended and, in the case of mainframes running older communications software, the reprogramming of the microcomputer to attempt a breach of security.

• *End-User Functions.* According to the producers of microcomputer software applications, every commercially successful microcomputer software application is in some sense a replacement for an end-user function that did not require the full capabilities of the mainframe. Examples of such successful packages include Micropro International Corp.'s Wordstar, Visicalc and Ashton-Tate's Dbase II.

The primary issues that should be considered before cutting an application loose on a microcomputer are maintenance, control and data integrity.

Lebow is a regular columnist for United Press International and a microcomputer consultant based in Philadelphia.

Connecting Micros To Major Networks

By Charles Morel
Special to CW‡

IBM's Personal Computer can be connected to a large host network in a number of ways. Unfortunately, IBM does not currently provide systems software for large host networks to support the Personal Computer as an intelligent device.

To connect the Personal Computer to a network, the microcomputer must emulate another device. The four major emulators are a start/stop terminal emulator, a protocol converter, an IBM Systems Network Architecture (SNA) 3274 emulator and emulators of IBM 3278 or 3279 CRT terminals.

Economy and ease of use are the most practical criteria when selecting an emulator. The cost of a given emulation technique can be divided into direct, recurring and hidden categories.

Direct costs are those associated with the acquisition of hardware and software components required to effect the physical path between the Personal Computer and the host. Recurring costs include maintenance, lease costs and fees associated with the physical path. Hidden costs can be thought of as a subjective judgment of the relative usefulness or utility of the emulation function to the Personal Computer user.

Start/Stop Emulation

Start/stop terminal emulation by the Personal Computer is the most familiar connection technique. Figure 1 depicts the connection of the Personal Computer to a host through two IBM 3705 communications front-end processors. One 3705 is running IBM's Advanced Communications Function/Network Control Program (ACF/NCP) with IBM's Network Terminal Option. The second 3705 is running IBM's Emulation Program emulating an older IBM 2700 series communications processor.

When determining the direct cost of this connection, factors like the emulator software, a serial port, an asynchronous modem and telephone charges directly affect the Personal Computer. In addition, telephone charges to include a rotor or hunting group, asynchronous modems, line set costs on the front end, software memory resource requirements in the front end and software license fees directly affect the host.

In any case, start/stop terminal emulation is probably the least expensive way to connect the Personal Computer to a host processor. However, this method has several drawbacks. Delays because of busy lines, operators' difficulty in establishing a host connection and single-line interactions are some of the most glaring problems.

The Personal Computer can be connected to a protocol converter. The protocol converter emulates a remote 3274 cluster controller to the 3705 front-end processor. The protocol on the communications link can be binary synchronous or SNA/Synchronous Data Link Control (SNA/SDLC). The Personal Computer emulates a start/stop terminal and communicates with the protocol converter over a switched or leased asynchronous line.

When determining the direct cost of using the protocol converter, essentially the same elements must be considered with the Personal Computer as under a start/stop emulator. At the protocol converter, the following components should be pro-

(Continued on SR/16)

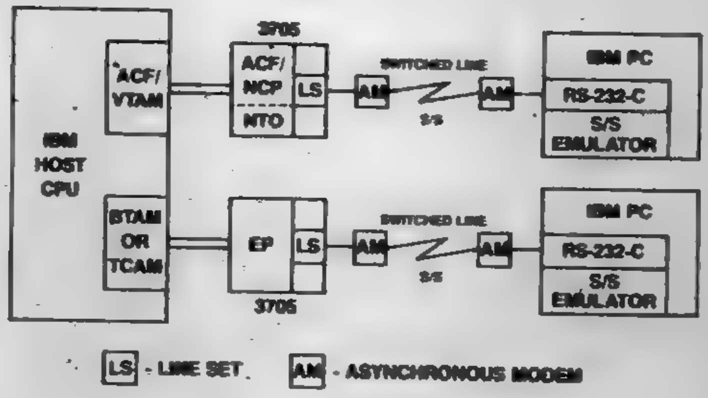
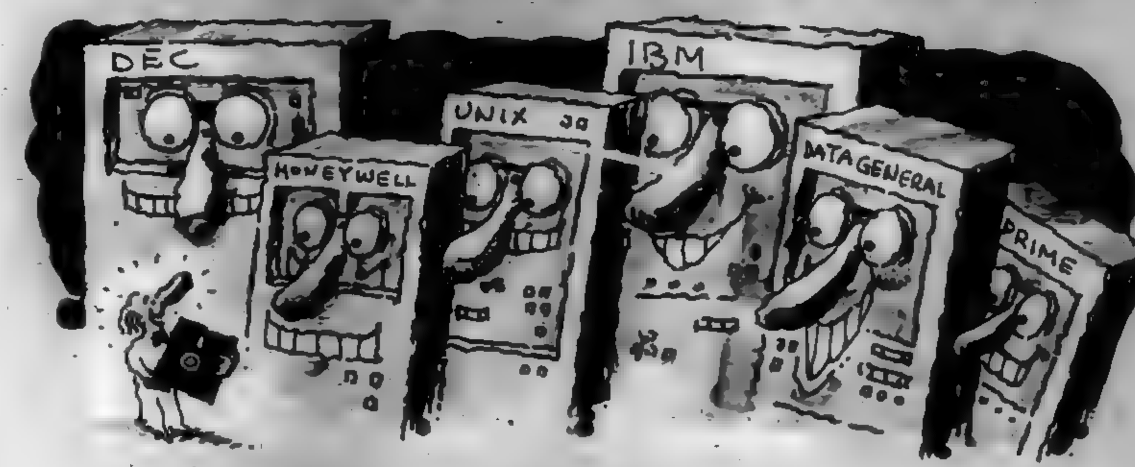


FIGURE 1: START/STOP EMULATOR

A SPREADSHEET FOR GROWN-UPS.



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Exploring Emulator Alternatives for Linking

(Continued from SR/15)

rated according to the total population of terminals that will have access through that particular converter: telephone charges to include a rotor or hunting group, asynchronous modems to communicate with the Personal Computer, asynchronous port costs on the protocol converter and synchronous modems for communication with the host front end.

Again, the costs at the host front end should be prorated for the following: the telephone line, the synchronous modems for communication with the protocol converter, the line set on the 3705 and the memory requirements in the ACF/NCP to support either the Binary Synchronous Communications (BSC) or the SNA/SDLC protocol.

The maintenance cost of a protocol converter configuration is an important factor since the number of physical components are proportionally higher per terminal or micro than other alternatives.

Additionally, protocol converters using SNA/SDLC can be impacted due to changes to the SNA protocol affecting maintenance costs.

Full-Screen Capability

The protocol converter provides the Personal Computer with full-screen capability and permits the multiplexing of Personal Computers to the host front end.

However, when the type of asynchronous line is switched between the micro and the protocol converter, drawbacks arise, as described in the start/stop emulator discussion.

The third technique emulates the 3274 Model 51C with attached 3278 Model 2 keyboard/display and 3289 printer.

An example of this form of emulation is the IBM SNA 3270 package, which runs on the Personal Computer. This package allows the micro to connect to the host front end as an SNA/SDLC cluster controller and terminal.

The telephone connection is either switched or leased. A leased connection can be multidropped, which means the line can be shared among multiple Personal Computers and/or other SNA/SDLC controllers.

The following direct costs relating to the Personal Computer should be considered when evaluating this form of connection: the SNA 3270 hardware, the SNA 3270 software, the synchronous modem and telephone service.

At the host front end, costs are about the same as with the protocol converter.

It should be noted that the SNA 3270 package is limited to a single user per Personal Computer and only the line resources can be shared between Personal Computers.

Synchronous modems are expensive and at the higher transmission rates, the modem cost could exceed the cost of the Personal Computer itself.

Since each Personal Computer supported in this manner requires a synchronous modem for its exclusive use, this is one of the more expensive alternatives.

The network maintenance associated with this method is also expensive because of the small number of users over which the costs can be prorated.

Even though SNA is a relatively volatile protocol, there would be little concern that IBM's SNA 3270 package on the Personal Computer would not be kept current.

The SNA 3270 package provides the Personal Computer with full-screen capability and permits direct use of the Personal Computer printer by host applications. When the type of synchronous line is switched between the Personal Comput-

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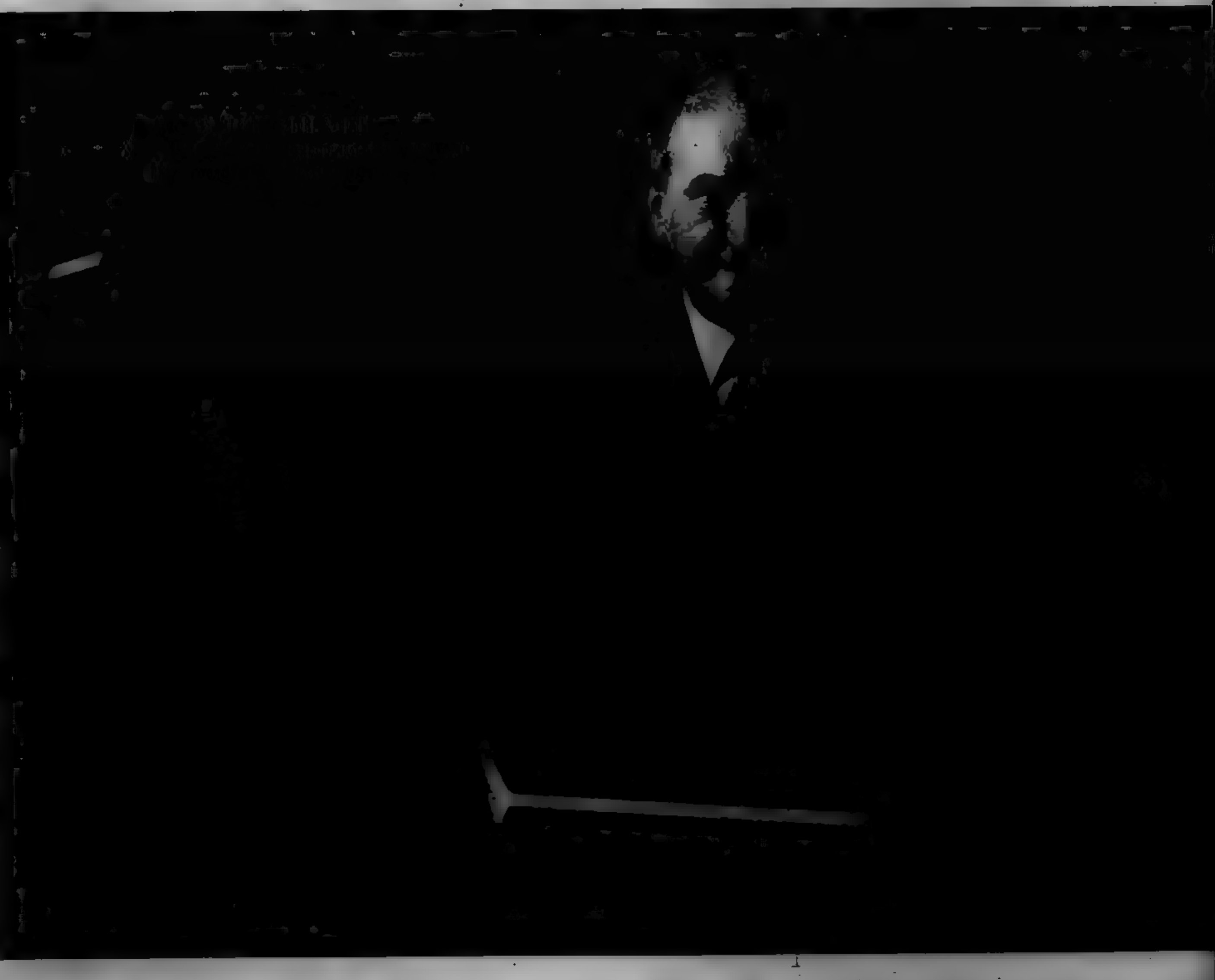


Personal Computers to Large Host Networks

er and the host front end, those drawbacks normally associated with dial-up lines come into play again.

A form of connection that has recently become available permits connection of the micro directly to the coaxial cable of an IBM 3274/3276 cluster controller.

One example of this type of connection is Pcox, a product of CXI, Inc. This type of connection requires the addition of hardware and software in the Personal Computer.

A Personal Computer with a 3278 or 3279 emulator can be used in any network configuration where a 3278 or 3279 would be appropriate. This method can be used to connect the Personal Computer to 3274s that are channel-attached to the host system.

Also, 3274s or 3276s can be remotely attached using BSC or SNA/SDLC protocols through the front end. The ability to connect directly to channel-attached 3274s distinguishes this method.

The direct cost in this case includes the 3278 or 3279 emulator hardware and software associated with the Personal Computer. The cost of the 3274 or 3276 should be prorated over the number of terminals and Personal Computers connected to the cluster controller. These are the only costs for Personal Computers connected to channel-attached 3274s. For remote 3274s or 3276s, the synchronous modem and the line cost must also be prorated.

Additionally, costs at the host front end are prorated over the terminals and Personal Computers sharing those facilities and should include a telephone line, a synchronous modem, half of the 3705 line set and the memory requirements in the ACF/NCP to support the SNA/SDLC protocol.

Maintenance Minimal

The network maintenance required for 3278 or 3279 emulators is minimal since that maintenance is prorated over the terminal base on the existing 3274s or 3276s, which can support up to 32 devices.

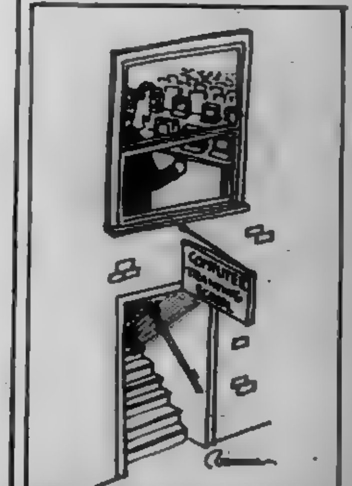
Full-screen capability is provided by Pcox and similar 3278 or 3279 emulators on channel attached 3274s or remotely attached 3274s 3276s.

Since the 3278 or 3279 emulators can be connected to the cluster controllers under IBM Personal Computer program control, effecting connection to the host system is as simple as running the appropriate 3278 or 3279 emulator software in the Personal Computer.

All of the above connection techniques permit the Personal Computer to connect to the host, perform the necessary interactions and return to local operations by disconnecting from the host.

Each method has distinguishing properties that would make it appropriate for certain environments. The large installed base of IBM host computers and the rapidly expanding population of IBM Personal Computers offer an attractive opportunity to benefit from interconnection between the two.

Morel is president of CXI, Inc. of Los Altos, Calif.



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Execs Access CPU's Data at Home With Micros

By Charles J. Aaron
And Bruce J. Goodman
Special to CW‡

Metropolitan Life Insurance Co. of New York had been toying for about two years with the idea of giving its executives access to data stored in the company's mainframes when IBM announced its Personal Computer. Already in the process of developing an experimental management workstation program, the firm decided to incorporate the Personal Computer into its experimental program.

Metropolitan's pilot program involves 12 executives, most of whom use IBM 3279-type terminals connected directly to the firm's 3081 mainframes. There are five 3081s at Metropolitan, but for the experiment, the executives are tied to one 3081 dedicated to CICS applications.

In addition, the executives can access an IBM 8100 distributed processing system directly through the 3279 terminals to handle large word processing operations. The 8100 processor uses a DPCX operating system while the 3081 mainframes use IBM's MVS and VM operating systems.

For the workstation experiment, a CICS application was developed to provide an automated in-basket and call-up system incorporating both a memo-generation facility as well as an electronic mail feature.

Early on in the project, it became evident that the executives might want the same basic features of the CICS system available at home as well. At this point, the decision was made to duplicate the CICS application on the IBM Personal Computer, and subsequently micros were installed in the executives' homes.

A program was written to allow the Personal Computer to emulate an IBM 3101 CRT terminal. Communications to the 3081 host are carried out through one of two gateway processors — either an IBM Series/1 or a Honeywell, Inc. Level 6 minicomputer. Two Personal Computers were installed in the office to assist in solving any problems with the system.

Communications to the mainframe take place over a 1,200 bit/sec modem through the gateway processor, which is necessary because of the fundamental communications incompatibility between the Personal Computer and IBM's mainframe CICS environment.

Using the Personal Computer at home is virtually identical to using a 3279 terminal in the office. The main difference is the screen refresh process, which makes the Personal Computer about eight times slower than the 3279. In spite of that condition, the experiment has been termed a success.

Improving productivity is the obvious goal of home personal computers. The Metropolitan group is currently trying to develop more applications for the Personal Computers and is considering installing several more either in homes or offices. While the technical barriers associated with attaching the Personal Computers to an IBM mainframe have been largely overcome, there are still some problems.

Technical Backgrounds

Since both executives have programming and systems backgrounds, the process of accessing a CICS application from micros in their homes went fairly smoothly. Executives who are not as "DP-smart," however, would have more of a problem. Also, because the experiment was aimed at evaluating whether an IBM Personal Computer could be used adequately in a CICS environment, not much effort was put into making the system user-friendly.

However, those with little DP background will tend not to use the system; they may be less likely to recognize its potential as a productivity tool. Making the system a true productivity tool will take a great deal of user education and motivation. In addition, more user-friendly software must be developed.

A more general problem with using micros at home is the effect on families. Micros give executives an opportunity to work 24-hours-a-day. Previously, the work that could be done at home was limited by the amount of material they could stuff in their briefcases. If most executives were given home micros, they could call their subordinates, create key files and call up data at virtually any time. Adapting to this situation could take some time.

The Metropolitan experiment is planned for two more years. During that time, the wide range of ways in which a micro can support Metropolitan's business environment will be explored.

Aaron is assistant vice-president and Bruce J. Goodman is vice-president, electronic installations, at Metropolitan Life Insurance. Both men are part of an ongoing experiment using IBM's Personal Computer indirectly connected to an IBM mainframe CICS environment.

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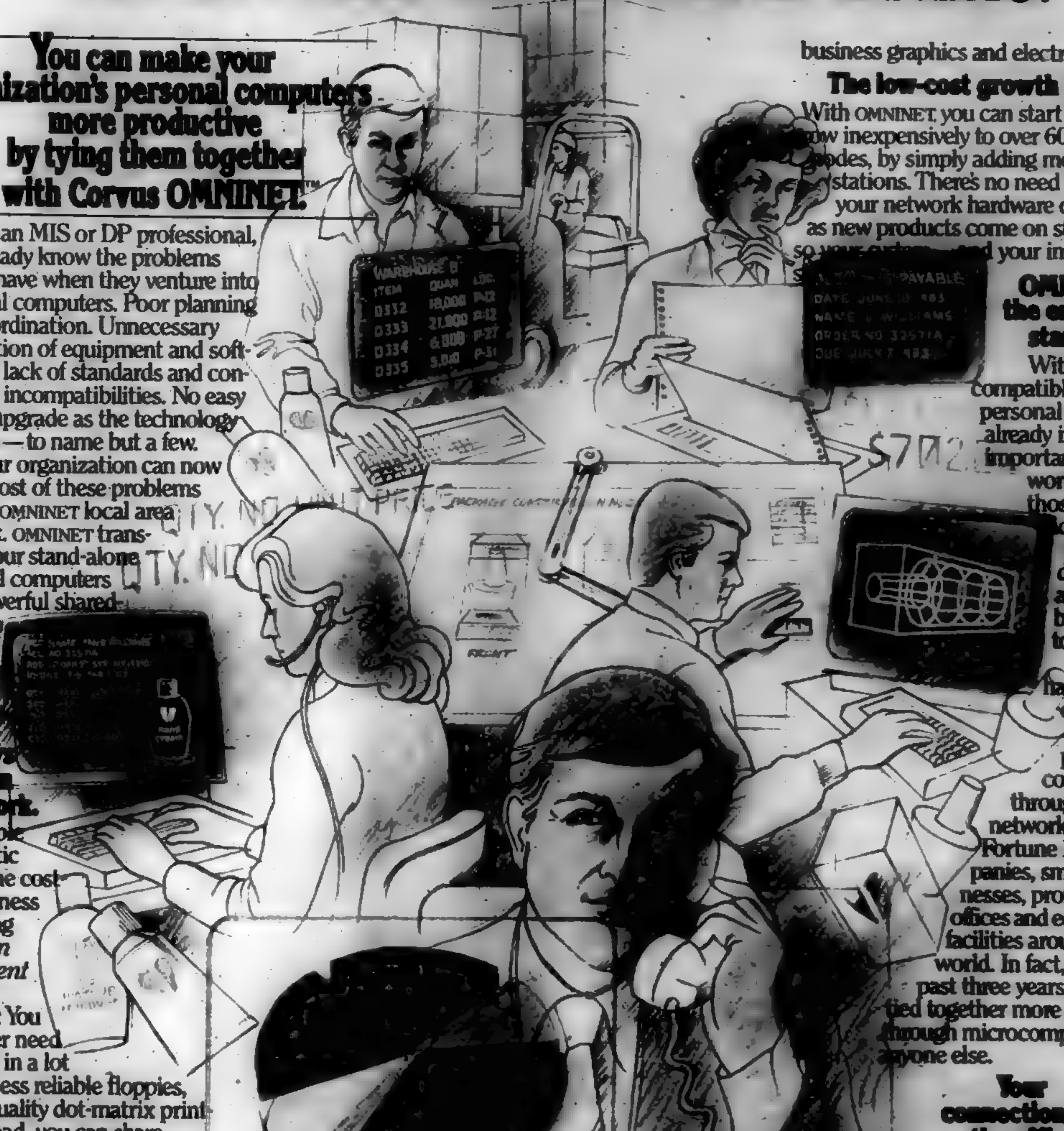

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Speeds Up In-House Operations

Micro Connection Solves Logjams at Company

By Michael Ceigler
Special to CW‡

Intelligent Systems Corp. (ISC), a manufacturer of color graphics microcomputers and terminals, not only sells its products worldwide, but also uses them to speed in-house operations.

Since 1978, ISC has grown annually by more than 40%, creating a need for responsive, expandable data processing. During this period, the company used microcomputers connected to larger computers for more effective data entry.

The first such project was aimed at relieving data entry problems on an IBM System/32 that was used for payroll and order entry functions. The System/32 had only one keyboard for data entry, one printer and no provision for remote processing.

The subsequent logjam was eliminated by using the company's 8080-based Intecolor 8053 microcomputer to prepare order entry disks. The microcomputer, which used the FCS operating system developed by ISC, was programmed to produce IBM-like 3741 (basic interchange) diskettes for the System/32 to read. The diskettes were then processed in batch mode.

Improving Data Entry

The software, which was made available for sale, emulates an IBM 3741 with full-screen editing and color enhancement. Color coding made data entry faster and more accurate by highlighting key information and reducing eye strain, thus reducing operator error significantly.

A second project produced customer service information files and shipping documentation off-line. This project utilized a proprietary data base management system written in interpreted Basic and an Intecolor 8053 with the FCS operating system.

The system required an initial file of customer information keyed by order number and a second file of item descriptions keyed by part number.

The first file was derived from the customer master list and the open order file on the System/32. It was updated daily on the Intecolor 8053.

The second file was derived from the item master file and it was updated less frequently. A third file was keyed by serial number and was maintained on the 8053. The third file contained the product configuration.

These three files produced and printed an accurate packing list. In addition, the files created a library of customer information essential to the marketing and customer service departments.

When the company outgrew the System/32 and purchased a System/34, both applications were transferred. The size of the transferred file keyed by order number grew with sales volume. In addition, the part number file grew with the expanded product line.

This rapid expansion led to an inevitable rewrite of the shipping system. The new system, which has been in use for over a year, runs on an Intecolor 8064 Digital Research, Inc. CP/M-based desktop computer. The microcomputer has a color graphics display, 64K bytes of memory and four 1M-byte floppy disks. In addition, the micro uses Ashton-Tate's Dbase II.

The new shipping system provides, in addition to

(Continued on SR/22)

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College Tests Micros, Selects Portable CPU

By Michael S. Hines
Special to CW‡

In the fall of 1981, the computing center at Oberlin College in Oberlin, Ohio, began a study of personal computers. The purpose of this study was to recommend a standard microcomputer to be supported by the computing center for use by faculty, staff and students.

The criteria identified for this evaluation were:

- Cost of hardware and software.
- Ability to foster a standardized hardware and software environment so all users had the same features, options and so on.
- Transportability — ease of moving the equipment for a mobile population.
- Maintainability — the ability to provide local support for units on campus.
- Technology transparency — users should be able to become productive without learning computer programming, operations or terminology.
- The willingness of the vendor to establish a supportive relationship with the college.
- Availability of programs for special needs.

Since Oberlin is a liberal arts college, many of the academic endeavors that take place here involve writing and composition skills. One of the requirements for a personal computer, therefore, was that a very powerful word processing capability be available.

A secondary consideration was that the unit be able to function as a first-level programming tool. Basic was chosen as the language to support because most students and staff are acquainted with it. Fortran, whose concepts easily translate to the Basic language, was an alternative choice.

The market study culminated in July of 1982 with Oberlin signing an agreement with Osborne Computer Corp.

The agreement allows Oberlin to make the Osborne microcomputer available to the college community at an institutionally subsidized price that is substantially below the suggested retail price.

Chosen for Low Cost

The Osborne 1 was chosen because of its low total cost; the $1,795 suggested retail price includes a full business keyboard, built-in CRT display and two built-in floppy disk drives. It also includes a CPU with 64K bytes of random-access memory and standard RS-232 and IEEE 488 interfaces.

The price also includes the following software: Digital Research, Inc.'s CP/M operating system and utilities; Micropro International Corp.'s Wordstar word processor and Mailmerge word/data merge processor; Microsoft, Inc.'s Mbasic Basic interpreter; Compiler Systems, Inc.'s Cbasic Basic Pseudocompiler and Sorcim Corp.'s Supercalc electronic spreadsheet.

Since the initial agreement was signed, the program has expanded rapidly. Through Dec. 31, 1982, there have been 173 units installed on the Oberlin campus. The distribution of these units is as follows:

- Faculty — 40.
- Staff — 28.
- Students — 53.
- Total individuals — 121.

The computing center encouraged the formation of a users group to assist people who owned or were considering purchase of the Osborne 1. This group has been functioning for about four months.

The group meets twice monthly and has general presentations on how to use the computer hardware and software followed by an open session during which demonstrations are given

(Continued on SR/22)

Prewritten applications cover a wide variety of business operations, ranging from general accounting modules to financial modeling and word processing systems.

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CIE SYSTEMS

Price Key to College's Selection of Portable CPU

(Continued from SR/21)

and informal consultations are conducted.

The forum has helped many users by allowing quick exchange of information about the system's capabilities and limitations.

The Administrative Systems Division of the computing center is taking the lead in integrating the Osborne 1 into the administrative computing network.

Serves as a Micro

The Osborne 1 makes an ideal management workstation in that it can serve as a personal computer for word processing, simulation and modeling (using Supercalc and other software), computing (using Mbasic/Cbasic) and other commercial applications.

It can also be used as a terminal to gain access to the central computer and as a remote-entry workstation for sending and receiving data.

Oberlin is now studying how the variety of commercial software in the CP/M-compatible marketplace might be used to alleviate the applications development backlog at the educational institution.

The college is concerned that necessary system interfaces be maintained so that all administrative applications complement each other and produce a cohesive system.

Oberlin's experience to date has been quite satisfying. It has seen the downloading of personal applications such as word processing, modeling and simulation.

In addition, programming has enhanced its academic environment while reducing the load on the central computer.

Hines is director of administrative systems support, Irvin E. Houck Computing Center, Oberlin College.

Firm Solves DP Needs

(Continued from SR/20)

packing information, end-of-day reports to management and shipping labels printed on a second printer. It also provides a daily serial number log and a basic interchange disk for daily batch updates of the open order file.

ISC's micro/host interfaces have been confined to batch operations involving disk I/O rather than on-line operations. Initially, this was due to lack of support for multiple users on the System/32.

The System/34, however, which does support multiple users, poses major hardware problems. Whereas most microcomputers are designed for relatively slow 9,600 bit/sec asynchronous Ascii data, the System/34's standard terminal interface, a coaxial cable, has a much higher speed.

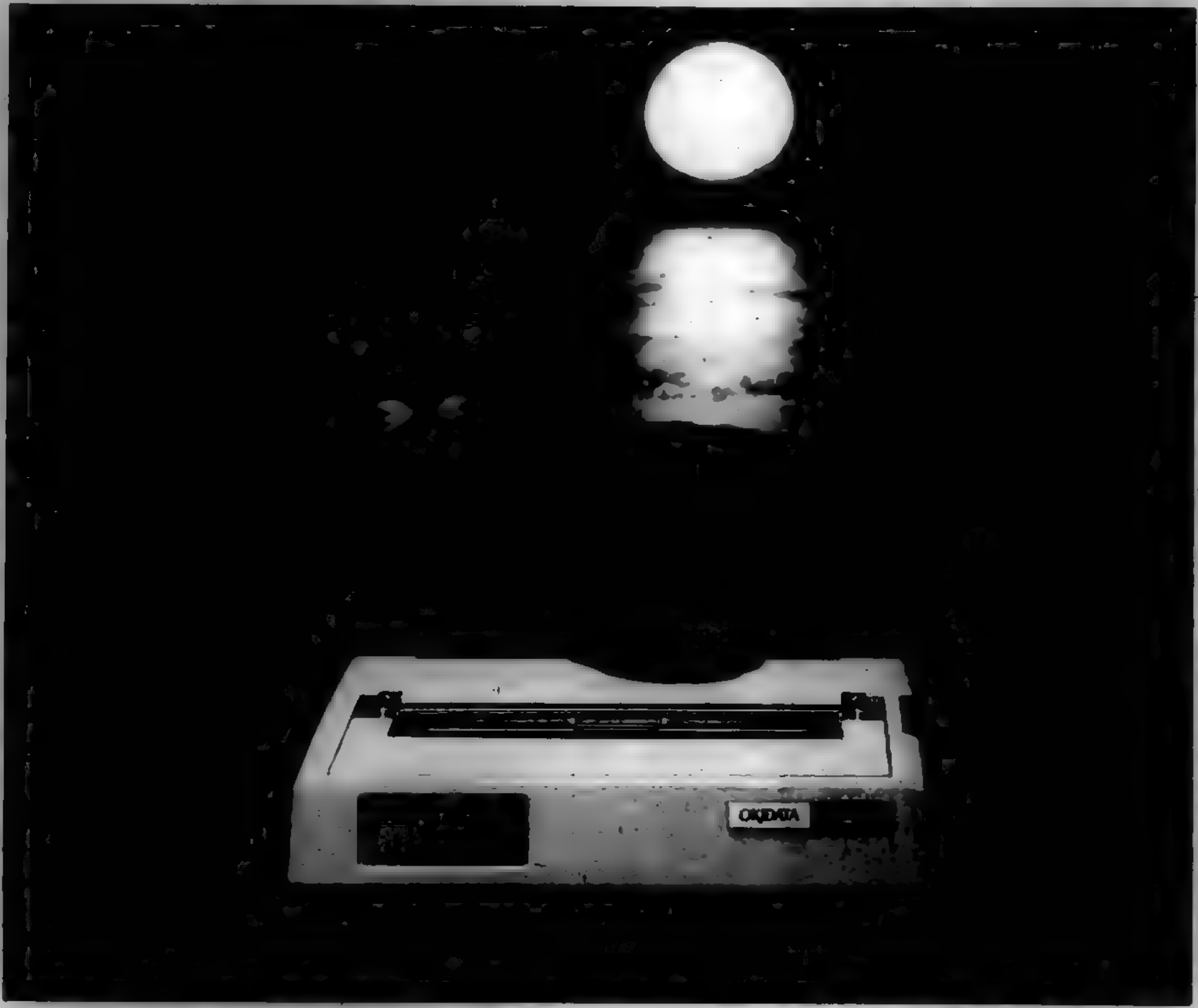
Planning an Application

The company is now planning a new application that provides partial automation of terminal firmware configuration.

The system will have an erasable programmable read-only memory programmer connected to an Intecolor microcomputer and a local disk for storing the firmware options. This will be connected to the System/34 via a protocol converter, thereby eliminating the coaxial problem.

The microcomputer will thus appear to the System/34 as an on-line terminal. Data will be accessed by a program that interactively returns order information on the screen in response to the order number request. Current plans are to have this system on-line later this year.

Ceigler is software manager at Intelligent Systems in Norcross, Ga.



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Twenty-Nine Micros Attached to Mini

Dolby Meets Demands by Building Micro Net

SAN FRANCISCO — Dolby Laboratories, a manufacturer of noise reduction systems, had problems. The firm could not meet demands for word processing and financial analysis functions, productivity was low and long-distance phone calls were high. Executive Vice-President Bill Jasper said Dolby solved most of those problems by installing 29 microcomputers attached to the firm's IBM System/34 minicomputer.

According to Michael Ham, the firm's information system manager, the system consists of 29 North Star Computers, Inc. Advantage microcomputers that function either as stand-alone processors or as terminals for the System/34. The Advantage processors also serve as a communications server providing a gateway to a Xerox Corp. 860 word processing system. The system is tied together by a Rolm Corp. SCBX digital communications network with both voice and data capabilities.

"We wanted to integrate the total communications system to ensure maximum productivity. Computers are not good tools if people have to enter information in more than one system to do their work. In addition, we wanted only one computer and/or terminal on each desk. We did not want people feeling as though they were overwhelmed with equipment," Ham stated.

Dolby's solution combines the IBM System/34 with three other components, all linked with the Rolm SCBX. The first component consists of 29 North Star Advantage microcomputers located throughout the company's three-story headquarters building. The Advantage micros are used for stand-alone functions such as producing memos and letters, ordering engineering parts and supplies and performing financial projections.

All of these functions are accomplished with Digital Research, Inc. CP/M-based applications such as Micropro International Corp.'s Wordstar, Ashton Tate's Dbase II and Sorcim Corp.'s Supercalc, Ham said.

"One of the key reasons we selected the North Star Advantage as our micro base was its CP/M compatibility," Ham recalled.

Communications Server

Dolby has linked the microcomputers to a second component of the system — a communications server, part of the Ethernet network connecting three Xerox 860 dedicated word processing stations and two Xerox 8010 Star systems, which can produce and print out (via a laser printer) sophisticated graphics integrated with text in final report form, Ham said.

Employees can create rough drafts on their individual microcomputers and forward them to the Star systems via a modified version of Modem 73, a CP/M-based file transfer program. The modem program allows the user to establish communication with the Ethernet network, another North Star or an outside time-sharing computer. Once the session is set up, text or data files may be exchanged by pressing the appropriate command key. The draft can then be formatted on the Star system by either a word processing operator or the employee. In addition, it is possible to send the draft to one of the 860 processors.

> *'One of the problems that had to be solved . . . was to provide a means of interfacing [Dolby's] microcomputers with their asynchronous RS-232C communications lines to the System/34, which uses IBM's Synchronous Data Link Control.'*

Documents can be sent from the 860 processors to a file server using interactive terminal service software provided by Xerox. Once the document is in the file server, any microcomputer can be used to "check in" to the file server and pick up the document via the Modem 73 file transfer software, Ham explained.

One of the problems that had to be solved in designing Dolby's system was to provide a means of interfacing the microcomputers with their asynchronous RS-232C communications lines to the System/34, which uses IBM's Synchronous Data Link Control, Ham said.

This is where the third component of the system enters the picture. Dolby decided to install an IBM Se-

(Continued on SR/24)

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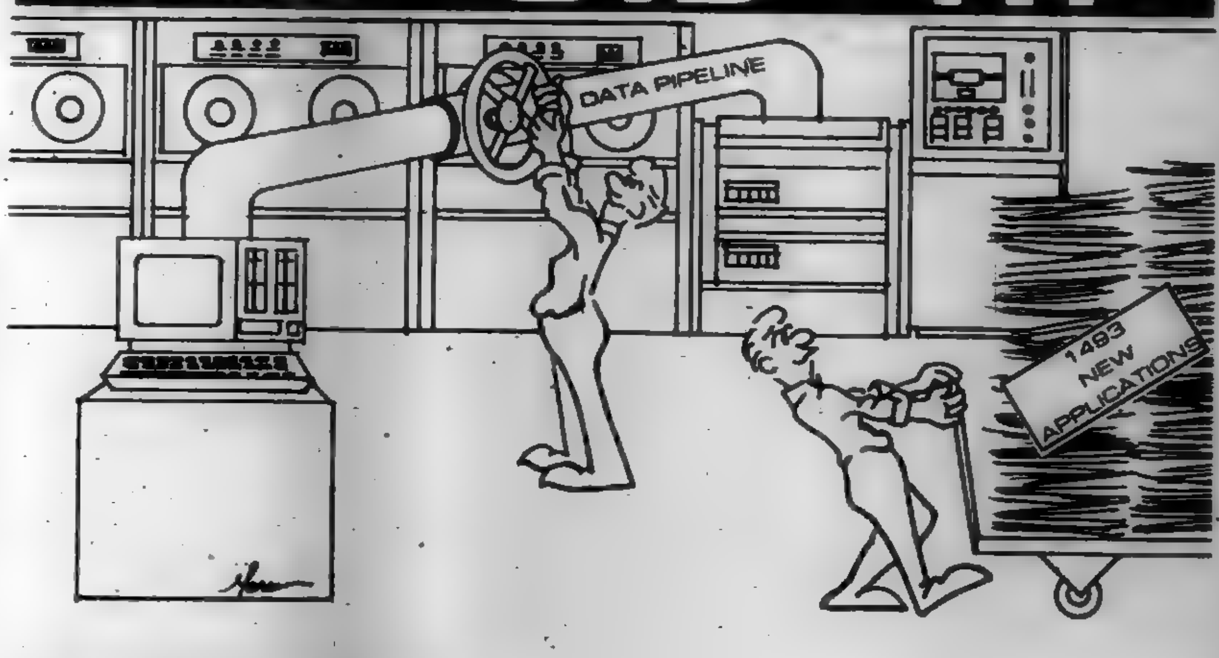

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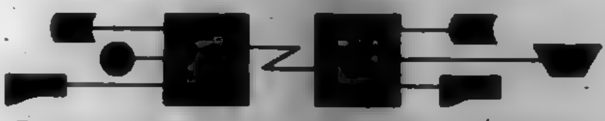

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. . . And Here Comes the Corporate Micro Store

All departmental personal computer acquisitions will now be coordinated by . . . the corporate microcomputer store.

FRAMINGHAM, Mass. — Memorandums to this effect have started to appear now in quite a few large corporations.

International Data Corp. (IDC), a market research firm based here, has predicted that the corporate market for microcomputers — for use by office workers in their daily work — will grow at an annual rate of around 40%. There will be between eight and 10 million personal computers on corporation office desks by the year 1990, according to IDC.

The corporate microcomputer store is likely to play a role in this explosive growth and will represent a significant channel of distribution. The corporate microcomputer store is a new phenomenon emerging in many corporations. Variously designated as the microcomputer store, the microcomputer resource center, the demonstration center or a similar term, it acknowledges the corporate trend toward individuals and departments acquiring their own micros rather than being tied to the data processing department.

A micro store is not the same as the purchase agreement that some Fortune 500 companies now have with computer vendors. Nor is the micro store to be confused with any employee benefit service for personal purposes. It has no relationship with the "discount specials" run by some credit unions. It is strictly an in-house store to help satisfy internal requirements.

Some Examples

- A large aerospace manufacturer in Southern California is about to inaugurate its microcomputer store.

Plans call for a fixed central location in the company. The store will stock at least one unit from each approved vendor and will have a staff of two. They will help prospects decide if they need and can use a microcomputer. The staff will demonstrate the equipment, help with the approval cycle and install the computer. The store not only will provide quick in-house maintenance at the board- or equipment-swapping level, but will also have a hot line. It can provide better and faster help than the retail store in the next shopping center.

- An international technology products corporation has approved plans for an in-house "distributed management and automation center." The center is part of the corporate information resource management plan. The center director reports to the vice-president in charge of finance, administration, planning and corporate development.

The center now has four demonstration units and one full-time staff member, chosen because of his experience and familiarity with the appli-

(Continued on SR/26)

Lab Meets Demands With Micro Network

(Continued from SR/23)

ries/1 minicomputer equipped with Gateway 34 protocol conversion software designed by Systar Corp. of San Jose, Calif. Dolby also chose Systar's Message 1 electronic mail software both for intraoffice purposes and for use as a front end for outside communications via the RCA Corp. and Western Union telex network, Ham said.

To interface with the Series/1, the North Star computers have been equipped with IBM 3101 block mode emulation software developed by Thomas Engineering of Concord, Calif. The Series/1 also converts the System/34's printer protocol for use with Xerox's Diablo letter-quality printers placed throughout the office. The Series/1 is directly linked both to telex facilities and to the System/34, Ham noted.

Another problem was how to tie the microcomputers into a network that would let users conveniently access the System/34, via the Series/1, Ethernet and its Xerox processors. In addition, Diablo printers and modems had to be installed and placed strategically throughout the offices.

"For other reasons, including rising telecommunications costs, we were looking into more flexible and up-to-date telephone networks," Jasper explained. "It was logical to evaluate those that provided data communications as well as the other features we needed," he said.

The Rolm SCBX provides data communications switching for the Advantage micros equipped to transmit at 9,600, 1,200 or 300 bit/sec; the Series/1 processor, which operates at 9,600 bit/sec; several Diablo printers connected directly to the SCBX; and a pool of 300 and 1,200 bit/sec modems. This minimizes costs for data calls made off-site as the SCBX automatically selects the appropriate modem, Ham said.

Access Is Simple

Accessing various system features from a microcomputer is easy. The user pushes a "request for service" switch on his DTI, which connects his microcomputer to the SCBX switch. The SCBX then prompts the user to enter the number of the resource he wishes to access.

After the number is entered, the SCBX connects the microcomputer to the desired resource, such as the communications computer, a printer or a modem. If that resource is busy, the SCBX informs the user and tells him how many others are waiting to use the resource. If he wishes to wait, the user will be queued automatically or he can choose to cancel; either way, he can make the most productive use of his time, Ham said.

Off-site users can also access the system via a modem by dialing directly or by having the receptionist who operates the attendant's console connect them. Once the connection to the modem is established, the user sets up the data call with this off-site keyboard just as though he were in the office.

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Insurance Firm 'in the Ball Park' With System

NEW YORK — Early in 1982, the Pension Systems Department (PSD) of the Equitable Life Assurance Society here was confronted with a series of events and tasks that some might say could only take place in a system developer's nightmare:

- A strong internal policy of accountability was enacted.
- A major consulting firm that had just completed an analysis of PSD suggested use of tighter systems development management practices.
- One of the largest and most critical business application systems development efforts ever undertaken by PSD — containing approximately 40 subsystems — was ready to start.

Bill Fanning, a senior systems specialist with PSD, explained the situation: "We had two choices at the time. We could either use a 'seat-of-the-pants' approach for quickly estimating the effort involved and arriving at a plan or use a detailed task-by-task approach via one of the more traditional and rigorous methods.

"Our dilemma was that the first technique would probably yield results so unrealistic that we would lose credibility with our customers and fail to meet the new accountability criterion. The second option would take more time than we had because of the stringent business time frame requirements," Fanning lamented.

A Third Alternative

"Fortunately for us, a third alternative arose," Marvin Schlanger, a systems analyst for PSD, pointed out. "A project estimation system called Estimacs [from Management and Computer Services, Inc.] had been beta tested by another department within Equitable," he said.

"It was touted to be a reliable 'ball park' estimator for project effort hours," Schlanger explained. "Estimacs ran on an Apple Computer, Inc. Apple II microcomputer and could generate its estimates from the answers to 25 questions relating to major project factors expressed in business terms. Preliminary reports were favorable from other companies testing it, so we decided to evaluate it for ourselves," he said.

PSD then put Estimacs through a series of historical validation runs and tried it on several new projects. "The results were very interesting," Schlanger recalled. "On the historical test runs, Estimacs was very close to reality in most cases. In one of the cases that it missed, we did some further research and found that the project manager had forgotten to include external consultant time. When this was included, Estimacs was in the ball park again."

Estimacs was then put to work to solve the problem at hand. "Because we had 40 projects to deal with, we requested that Dr. Howard Rubin, the developer of Estimacs, generate a special 'batch' version of the product," Fanning said.

"In this way, we got our first cut estimates in a matter of hours. The results indicated that we had about 150 man-years of work ahead of us and that the total system would take about seven years to implement," be said. "This was the kind of information that we wanted for planning purposes, but Estimacs helped us in some un-

(Continued on SR/28)

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Microcomputer Stores Meet Corporate Needs

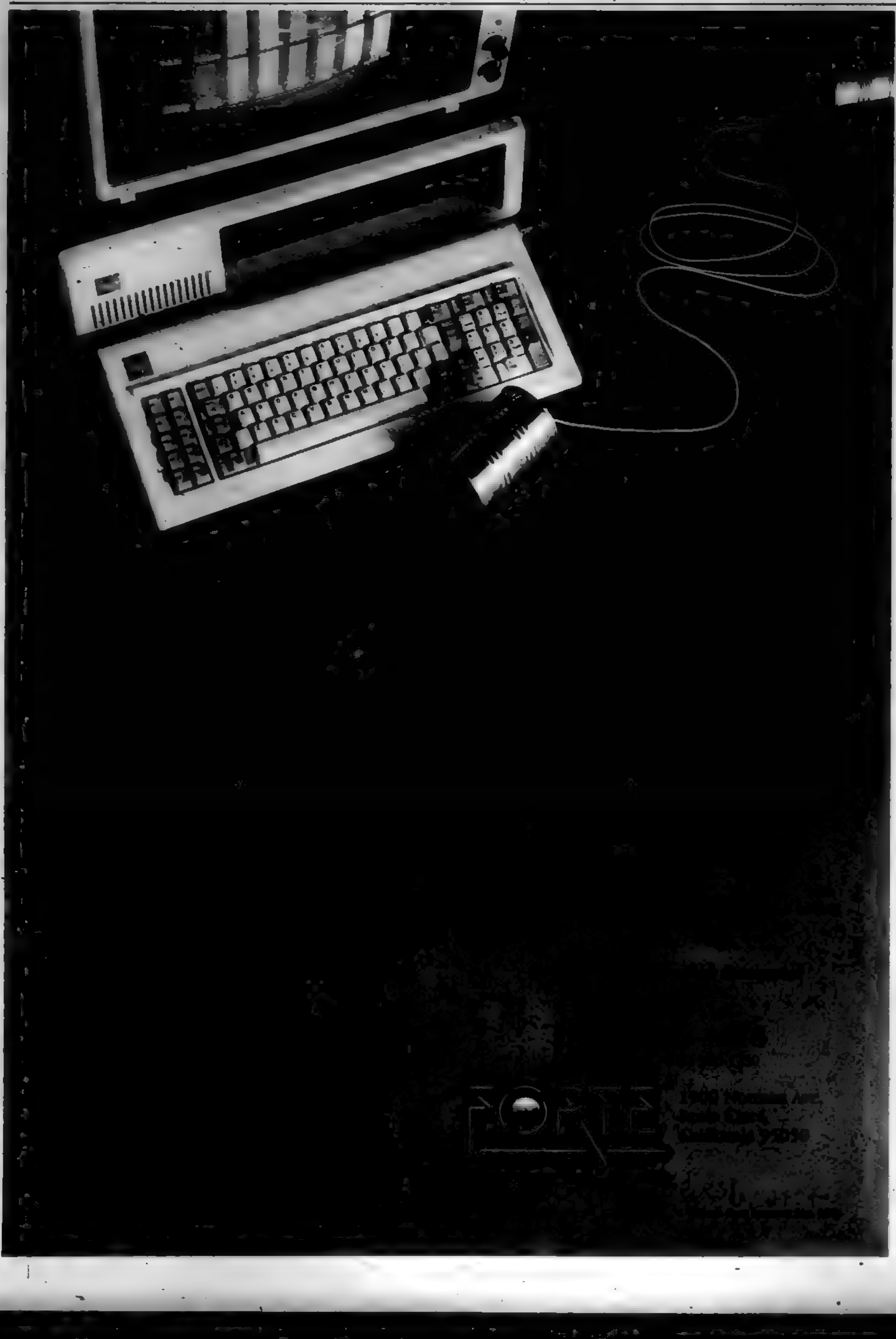
(Continued from SR/24)

cations software that the center will promote. This staff member demonstrates the equipment and provides hands-on training to prospects. The center director helps the buyer persuade his department head of the need for and effectiveness of the microcomputer.

Do not expect to find a sign on the door of the computer store. Its manager will probably appear in the company's organization chart as director of office automation, equipment planning, technology development, productivity enhancement, resource planning or simply "planning staff" to the vice-president.

Of considerable significance to the vendors is the fact that this planner is a knowledgeable person and is less inclined to single-supplier procurement. Some of the corporate microcomputer stores now sell, in-house, four or more micros from assorted vendors.

The store is characterized by an extremely small staff — seldom consisting of more than two people. The store is generally outside of the traditional data processing or management information systems domain. Furthermore, corporate management appears to be pulling the store deliberately into the mainstream of their companies.



The micro store phenomenon started in high-technology companies. Aerospace and electronics manufacturers were the first to sell in-house microcomputers and related equipment. The micro store appears to be spreading to progressive companies — large chemical and pharmaceutical houses, publishers, some international banks and insurance companies. If the company periodically issues pronouncements about its "goal of increased productivity through appropriate technology," it is a safe bet that a store may soon be established — if it has not already been.

An established store will have already identified its sources and negotiated agreements with them. Initially, stores tend to pick the most popular or well-known models — those produced, for example, by Apple Computer, Inc., Digital Equipment Corp. or IBM. It will be difficult for other vendors to penetrate these stores for at least some time. The key to entry into corporate microcomputer stores is to sell to companies as they formulate their plans.

Set of Criteria

A set of criteria that would help a vendor qualify companies likely to establish a corporate microcomputer store is outlined below. Seven or more "yes" answers indicate a strong possibility that a company is likely to start a store:

- Is it a high-technology company?
- Are the annual revenues more than $250 million?
- Is the research and development budget at least 15% of the product budget?
- Does the company have more than four major divisions?
- Are the divisions known to be fairly autonomous?
- Are most of the major divisions located in one metropolitan area?
- Does the company employ a large number of professionals?
- Does it have a large multimainframe DP installation?
- Does the DP department have more than 65 employees on its staff?
- Does the company have a vice-president for planning and corporate development?

If the corporation is likely to have a microcomputer store, the next step is to locate the person in charge. In-

(Continued on SR/28)

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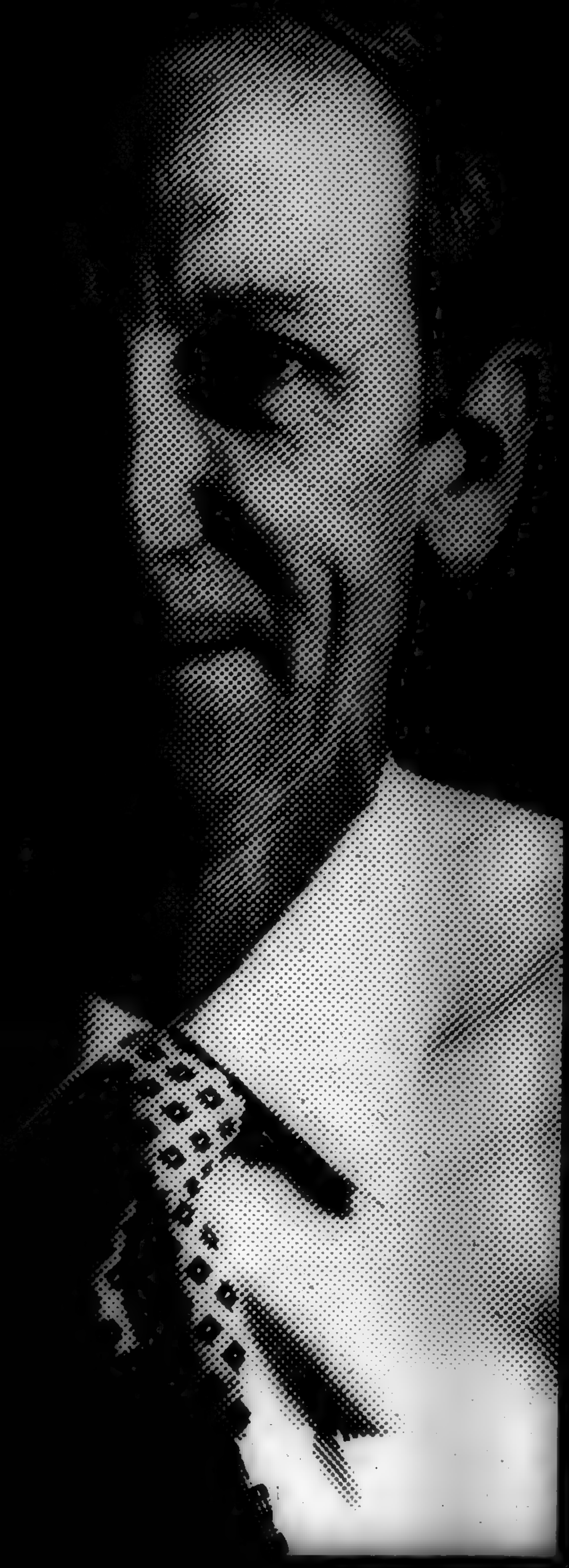

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Insurance Firm Plans Projects With System

(Continued from SR/25)

expected ways when we started using the standard interactive version."

"Estimacs became somewhat of a design tool in itself," Schlanger explained. "In answering the questions about each specific system, we became aware of redundancies and inconsistencies in our conceptual design. In fact, Estimacs actually helped us visualize our designs from the viewpoint of time trade-offs. Our system evolved as we estimated it. Another benefit was the consistent approach it gave us for each project," he said.

Estimacs is now the cornerstone of PSD's management practices in the area of project estimation and planning. Schlanger has integrated it into the PSD estimation methodology. "We apply Estimacs three times during the development life cycle," he said.

"We first use it at project initiation. We sit down with our customer and Estimacs and go through the estimation process. This is a learning experience for all parties. On occasion, the customer has looked at some of the questions as they come up on the interactive display and realized that his ideas were not yet well enough defined to continue. This helps us get better system definitions early on. We then take this initial estimate and run it through some [Visicorp] Visicalc worksheets to customize it exactly to our needs. We later repeat the process after we arrive at a conceptual and detailed design.

"Estimacs is, in a sense, one of our techniques for communicating with our customers. They see the estimation process, participate in it and really become part of the project in a new way," Schlanger concluded.

Fanning reflected on the way Estimacs has influenced PSD's workings: "We now have a tool that stimulates alternatives analysis and reminds us what we should be looking at. The circle of those actively participating and contributing to project planning has increased along with our productivity and accuracy.

"While many have concentrated solely on increasing the productivity of development efforts in the coding and testing phases, we have realized a big gain at the start of our project," he said.

PSD is now expanding its use of Estimacs to include all of its modules — staff-cost estimation, operational hardware estimation, risk analysis and work portfolio analysis.

User Needs Met By Micro Stores

(Continued from SR/26)

quiries to the DP manager may not lead to the right person. Look for someone who works for the president or vice-president who has one or more of the functions previously mentioned.

The corporate computer store will be understaffed and will have a long list of responsibilities. The more a vendor can help with these, the more assurance of success.

Elements for a Successful Approach

IDC ranks the elements for a successful approach to the corporate microcomputer store as follows:

- *Full Spectrum of Applications.* Good word processing and spreadsheets are an absolute must. Engineering analysis, a data base management system and specific vertical applications, if available on your micro, will help.
- *Immediate and Local Maintenance.* Welcome the offer of an extra unit for swapping purposes at no cost. Store directors prefer to negotiate with the vendor directly, but will accept a reputable local dealer as its service center.
- *Modularity and Expandability.* The microcomputer should have the ability to go from a 32K-byte single floppy disk system to a 128K-byte system with a 5M-byte Winchester drive. The microcomputer should also be able to interface to a variety of printers.
- *Communications Capability.* A communications package and some electronic mail abilities will find ready acceptance.
- *Compatibility with Host Computers.* The ability for the microprocessor to function as an intelligent terminal to the host computers in the company will be a definite advantage. At least some form of compatibility with the existing computer base will be expected.
- *Resource Sharing.* Sharing of files, printers and any other resources between the micros will prove advantageous.
- *Price Discounts.* A discount structure is not the first item on the shopping list of the microcomputer store. But it will certainly get the director's attention.

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CW

As Home/Hobby Market Growth Slows

Small Businesses Lucrative Market for Micros

By Sid L. Huff
Special to CW‡

The micros are coming! The micros are coming! In fact, they are here. And compared to the giant mainframe computers of a few years ago, they are small, cheap and very friendly. They even have cute names — Apple, Pet, Personal Computer. But don't be misled: While these computers can play games such as Star Trek, backgammon or Asteroids, they are definitely no longer toys.

Many people associate microcomputers with computer games. Indeed, this was an early thrust for the micro market. "A computer in every household" was the gleam in the manufacturers' eyes, and early marketing efforts mainly addressed home usage: games, child education, income tax assistance and menu preparation. The hobbyist was also at the forefront. Anyone with a soldering iron and a love of tinkering could hook up a micro to control automatically the temperature of his shower.

The bad news became evident rather quickly — that the home/hobby universe never unfolded as intended. Very few people, it turned out, really wanted to store their recipes on a computer.

Now the good news. Just as the growth of the home/hobby market was slowing, micro manufacturers and retailers discovered another, much more lucrative market — small businesses. So-called small business computers have been around for some time, but most of these units have been priced higher than the truly small business could afford. Micros have changed the cost picture by a factor of 5 to 10. There are many businesses that would not consider a $50,000 computer, but today are very interested in what a $5,000 unit can do for them.

A case in point is John Greenway, who owns and operates Sanitary Products Co., a supplier of industrial cleaning products in London, Ont. When his business expanded a few years ago, he found that he was receiving his monthly accounting statements two to three months late — far too late to be of value in making important business decisions.

To reduce the manual bookkeeping burden, Greenway investigated small business computers. However, he found that he would have to pay more than $20,000 to get an adequate system, a figure well above what he was willing to spend.

Then last year he heard a radio advertisement for a $4,000 Apple computer from Apple Computer, Inc. He attended a seminar at Lyons Logic, one of London's retail computer stores, and ended up purchasing not one, but two Apple systems — one for each of his two businesses.

Greenway knew nothing about computers when he acquired his systems, so he relied heavily on the Lyons Logic staff for assistance and guidance. They helped him select the proper software packages for his accounts payable, accounts receivable and general ledger accounting on the machines.

Bookkeeping Methods

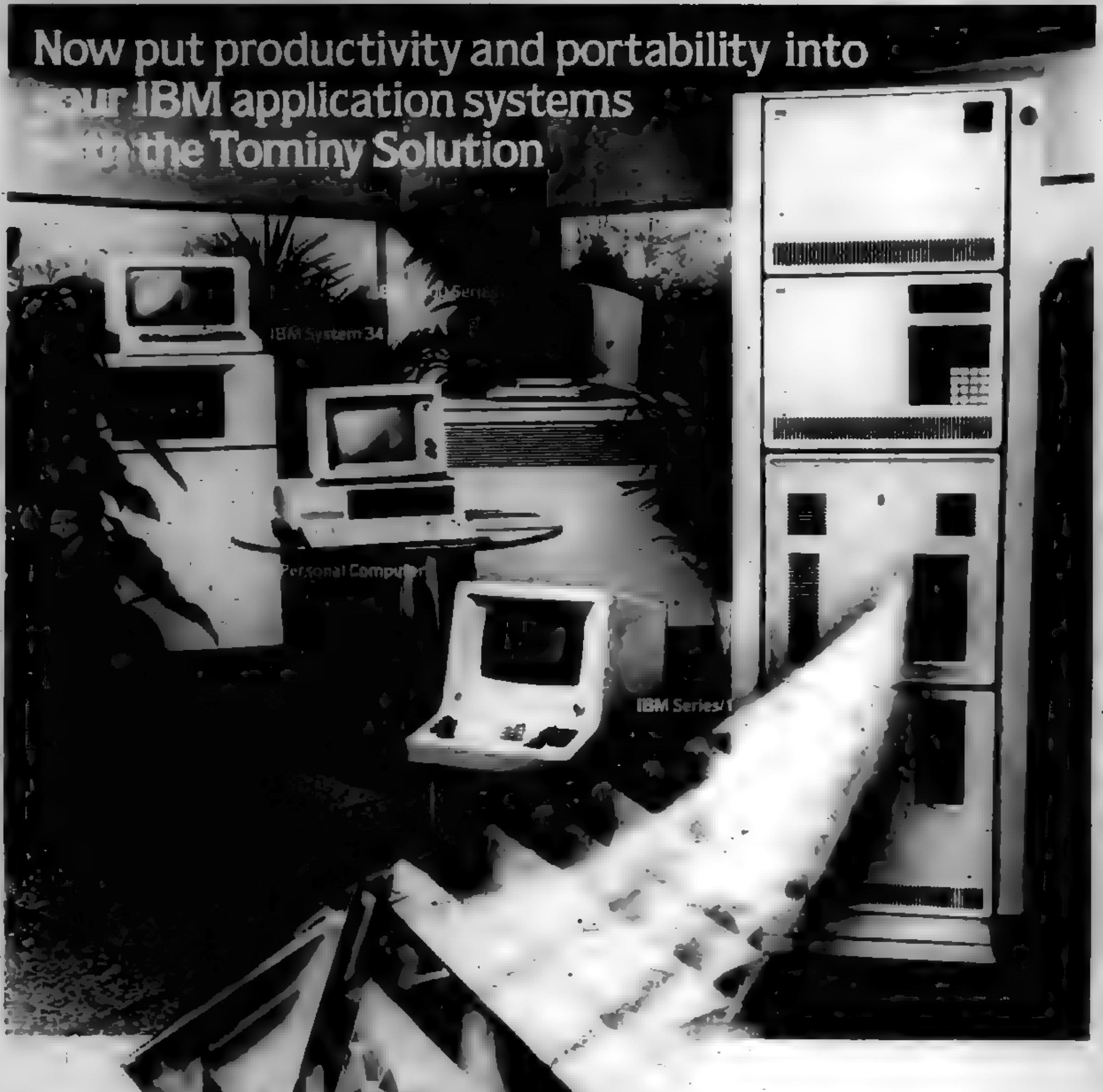
Fortunately, Greenway found that his bookkeeping methods could be transferred to the computers with little fuss. If this had not been the case, he probably would have had to hire a professional programmer to modify one of the available packages or develop one from scratch, either of which would have added substantially to the system's cost.

Greenway admitted he did have some difficulties getting his office staff to adapt to the new way of doing things. He found that he himself had to become involved in the details of converting from manual to computer-based accounting so that he could "hold the hands" of his staff as they learned how to use the computer.

Now that he has the present applications running smoothly, Greenway is planning some new ones. His next move will be to put his product inventory on the computer so that he can easily keep more accurate inventory records. He plans to build into the inventory management package a set of "triggers" so the system can tell him the optimum point at which to reorder each stock item. He also would like to use the computer to help him calculate the commissions of his salesmen. To do this, he purchased Visicorp's Visicalc software package.

Greenway is quite typical in that he has little interest in microcomputers for their own sake. He has never written a computer program. However, he has a strong interest in see-

(Continued on SR/34)



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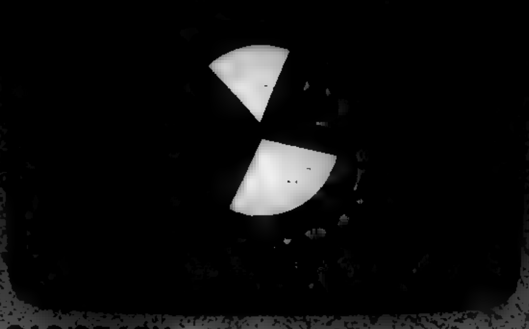

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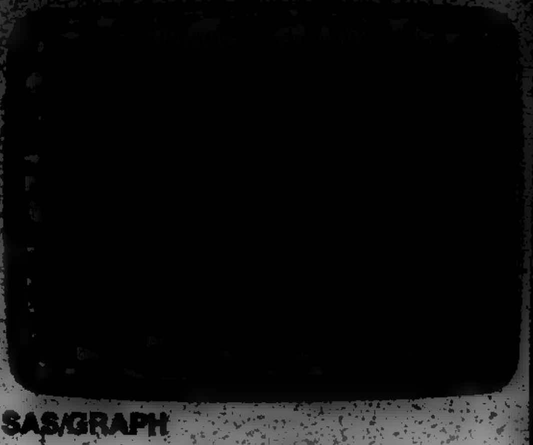

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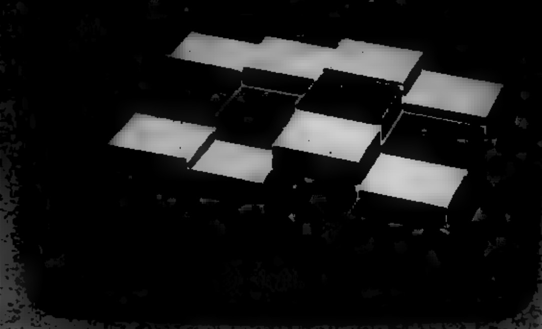

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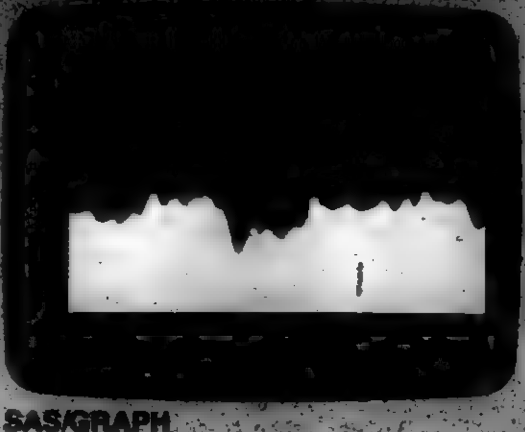

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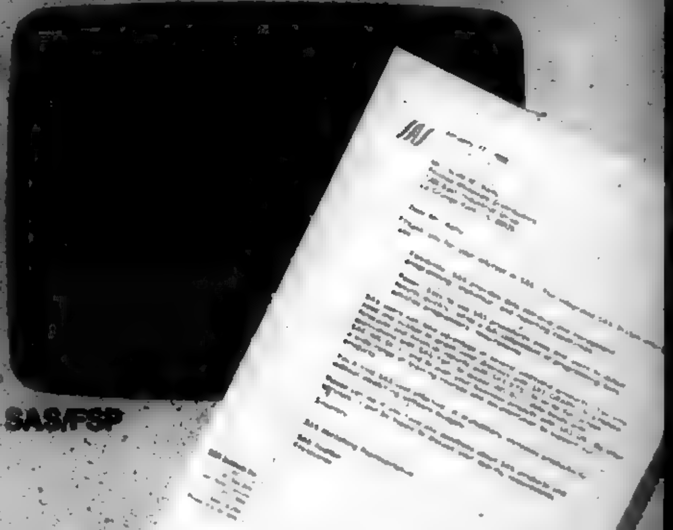

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Micros Making Headway in Small Businesses

(Continued from SR/30)

ing his business succeed, and he views his micro as a new and very useful tool in achieving that goal.

You might think that bigger companies with their own data processing departments and large computers would have no need for micros. This is not the case. In fact, in the future, the sales volume of micros to such firms will likely exceed that to first-time users like Greenway.

The reason is one of competitive advantage. There are certain kinds of services that large-company DP groups have traditionally failed to provide effectively to the managers in their organizations. These DP groups are generally very skilled at developing and running large, high-volume systems to process various kinds of transaction data, such as paychecks and sales orders, for the company.

But when it comes to providing personalized support tailored to the specific needs of individual managers, they are often much less effective. And the large "mainframe" computers these companies use are far less user-friendly or easy-to-use than are micros. The result is that the large-company DP groups simply cannot compete with micros for personalized computing.

One person who recognizes the competitive advantage of micros is Michael Brandon, manager of information systems for John Labatts Ltd. in London, Ont. Even though the corporate DP department reports to him, he is the one who convinced his company to acquire its first micro, an Apple III from Lyons Logic for $6,000.

The Apple III is one of the recently introduced "supermicros," microcomputers with substantially enhanced computing power. Brandon's Apple III, for instance, has more than 128K bytes of main memory.

One measure of Brandon's success with the Apple III concerns his colleague, Dick Haylock. Haylock spends much of his time projecting company financial statements, constantly attempting to determine what the impact would be on company performance if certain changes were to occur in either the company or the general economy.

The raw calculation burden of making these projections was staggering, so it seemed to be a natural computer application. The trouble is that when Haylock tried to use the company's main data processing facilities to do the work, he became so frustrated with the "unfriendliness" of the system that he eventually gave up and swore he would never use computers again.

Shortly after Lyons Logic had delivered the Apple III, Brandon showed Haylock some things the Visicalc program could do. A little while later, Haylock asked to borrow the computer for a few hours. Some days later, Brandon needed the micro to do his own work, but had to drive downtown instead to use one of the machines in the Lyons Logic showroom. Haylock was by that time so attached to the Apple III that he was using it throughout the day and refused to give it up. "Clearly," Brandon pointed out, "we are going to be acquiring more computers."

Sales and Service

Unlike the early days of home/hobby computers, most micro buyers today are novices as far as computer operations or programming is concerned. This means they are much more dependent on their dealer to provide services such as proper equipment selection, suggestions and guidance regarding the selection of software packages, servicing broken equipment and even training in various aspects of computer use.

One of the London dealers related a story about a customer who took up many hours of his staff's time for demonstrations and discussions, then proceeded to buy his computer from a cut-rate Toronto "warehouse." This sort of customer behavior is, of course, a problem in all retail businesses. However, the willingness of local dealers to provide that customer with follow-up service has obviously been impaired, and there are few fields wherein that relationship is important.

For one thing, owners of micros are often on the lookout for new ways in which they can use their machines. Few of them, however, want to read through the multitude of journals, newspapers, fliers, manuals and other literature that is churned out daily by the industry.

The service-oriented retailers spend hours each week trying to keep abreast of the latest hardware and software offerings for the products they sell and service. This knowledge alone makes them valuable partners in their customers' computing activities.

Huff is a professor at the University of Western Ontario, School of Business Administration, in London, Ont. Canada.

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With Broadband Cable TV System

Minis Weave Elaborate Net Over Texas Campus

By Thomas Madron
Special to CW‡

Communications systems are the foundation for integrated, distributed data processing in a multi-CPU environment, a fact that every large organization will have to confront in this decade.

Regardless of whether the intent has been to create a multi-CPU system, especially with the advent of microcomputers, no data processing organization will remain monolithic for long.

At North Texas State University, this problem was formally addressed in 1981-82 when several related decisions were made. The university required a larger and faster IBM-compatible machine and non-IBM-style interactive computing. It was already acquiring a number of microcomputers.

Through gifts to the Computer Science and Business Computer Information Systems Departments, the university had acquired four Texas Instruments, Inc. DS990 minicomputers. The library decided to automate with a Hewlett-Packard Co. HP 3000, and the print shop used an automated composition system.

Assorted Inventory

In early 1983, the computer inventory at North Texas, including on campus and on order, consisted of one IBM 3083, one IBM 3031, 10 minicomputers including three Digital Equipment Corp. VAX-11/780s, five TI 990s, one HP 3000 and an old HP 2000. Added to this "system" of computers were 200 to 300 assorted microcomputers as well as a large number of terminals.

Since funding was available to establish a new computer operations center and the demand to connect the various users existed, alternative communications systems were explored for the campus.

In designing a computer network, several design criteria were established. It was essential that selected problems were met and solved, including:

- Reliability.
- Connectivity among many devices including the ability for any two nodes to communicate directly with one another.
- Provisions for port contention and management.
- Normal communications at least as fast as 9,600 bit/sec.
- Capability for supporting not only Ascii devices but also (at least in the future) bisynchronous and synchronous devices.
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- Support for a large number of vendors' hardware.
- An affordable and cost-effective system.

In attempting to meet the criteria listed, a number of different technical solutions to the networking problem as well as a number of vendors within each technology were reviewed and evaluated. The local-area network was judged to be the conceptual arrangement that best fit the university's needs.

Unfortunately, in 1981-82, vendors either were not cost-effective or were only just beginning to provide the equipment necessary to build local-area networks that would suit North Texas' needs.

Networks such as IBM's Systems Network Architecture or DEC's Decnet were too narrowly restricted to the hardware of a limited number of vendors and were not designed as local-area networks. Xerox Corp.'s Ethernet was a potential candidate but suffered from a lack of general connectivity as well as from restrictions on the total length of the network (about 1.5 kilometers). Telephone technology using a digital private automatic branch exchange was rejected for reasons of cost as well as failure to meet other needs.

> *'The difficulty is that a university is often spread across a large campus . . . The objective was to connect everything and everybody.'*

A local-area network was chosen because it can function very effectively within one large building or even several closely associated buildings. It has good connectivity for de-

(Continued on SR/36)

The MICRO/MAINFRAME Connection....
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The pressure is on. But how do you afford the time to examine all the available products, cut through the marketing dazzle, and determine which products, if any, can help you get the job done, bring everything back together, and stay ahead of the game?

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"...extremely informative. I would estimate that we saved some three months of research. The presentation was truly unbiased and a refreshing change."

Jeanette Pearman
Information Center Manager
Albuquerque National Bank

"We thought we had done our homework beforehand...but we found so many new insights into the competing products that most of our preliminary legwork was invalidated. I can't imagine any attendee not getting more than his money's worth of decision support from the Software Decision Symposium."

William D. Masters
Michael Reese Hospital
and Medical Center

"Most helpful...anyone reaching a point where a decision is to be made should not do it before attending this symposium."

Henri Robitaille
Le Soleil Limitee

Microcomputers in a Mainframe World.
The end-users way out...or yours?

The Microcomputer, as we know it today, is only the beginning of a renaissance that already makes the Industrial Revolution look like a day at the beach, and will alter the way everyone looks at, deals with, and handles information in the future. The problem is it's come so quickly that there's been little time for understanding the technology, let alone formulating strategies for integration.

So, where do you start? How do you quickly assemble and exploit an effective microcomputer strategy, and still cope with your day-to-day problems?

The Answer:

Here's what the Micro Decision Symposium offers:

DAY 1

- What are the selection, configuration, and acquisition criteria you should be considering?
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- How do you integrate micros into the overall information systems strategy?
- What about security, data integrity, recovery, and auditability?

DAY 2

- What are the capabilities and limitations of the major hardware and software products?
- What are the real-world communications issues?
- How do you maintain and support micros?
- When do you use a Systems Integrator?
- How do you efficiently keep track of what's going on in the industry?

Schedule:

Seattle	April 20-21	Boston	May 17-18
San Francisco	April 27-28	New York City	May 24-25
Dallas	May 3-4	Baltimore	June 15-16
Chicago	May 10-11	Toronto	June 28-29

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DAY 1

- What is a Development Center?
- What are the different types of application generators?
- Do you need an integrated database management system?
- What are the management and implementation strategies?
- What products are available, and how do they compare?

DAY 2

- What is an Information Center?
- What types of jobs lend themselves to end-user development?
- What types of software should be available?
- What are the management and control issues?
- What products are available, and how do they compare?

Schedule:

New York City	May 3-4	Chicago	May 25-26
Pittsburgh	May 11-12	Toronto	June 8-9
Baltimore	May 18-19	San Jose	June 14-15

To Register:

To register, or get more information, call (800) 241-9970 or (404) 252-0616. Price per person is $595. If more than one attendee registers from the same company, in either symposium or any city, the second and subsequent registrants receive a 25% discount. The fee, which must be paid in advance, includes symposium coursebooks, all meeting materials, lunches, coffee breaks and a cocktail reception at the end of the first day.

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Mini Network Makes Waves on Texas Campus

(Continued from SR/35)

vices designed to be used by the system, but not very good general connectivity.

The difficulty is that a university is often spread across a large campus. North Texas State has, for example, nearly 19,000 students and 3,000 faculty and staff spread throughout 54 buildings. The objective was to connect everything and everybody.

The communications technology finally chosen was a broadband cable television system, Localnet 20, produced by Sytek, Inc. of Sunnyvale, Calif. There were several reasons, both technical and political, which guided the decision.

On the technical side, several vendors offered products that would allow the university to attach a wide variety of computer equipment to the cable, initially through RS-232 serial communications. The Sytek system has the decided advantage of not requiring a central processor. It maps its radio frequency modems on standard cable television. Sytek also has several products either available or under development that will provide support for bisynchronous or synchronous devices.

Once data is on the cable, the Localnet 20 provides a Carrier Sense Multiple Access/Collision Detection (CSMA/CD) packet-switched system. Initially, however, the Sytek products support a standard RS-232 serial interface with flow control that allows a wide variety of devices to be attached. The flow control system is primarily organized around an XON/XOFF standard.

The bandwidth of cable television systems is sufficiently broad to allow a variety of communications techniques. The Localnet 20 system divides a 6-MHz television channel into 20 300-KHz subchannels. Each subchannel can theoretically accommodate 256 connections for a total of approximately 5,000 connections on a pair of television channels.

In practice, a network would not be designed so heavily loaded. North Texas State set aside six inbound and six outbound channels for computer communications that could theoretically accommodate 30,000 separate connections. Each cable outlet can accommodate from two to eight RS-232 connections without further splitting or amplification.

The ultimate goal of any network is to provide services, but in a multi-CPU environment, the central computing center is not necessarily the only unit providing such services.

In addition to the central computing facilities composed of IBM-compatible systems and three VAX-11/780s, other departments have computer services that will be serviced by the network.

Faculty and staff will be able to send manuscripts to the print shop to be electronically composed on micros, word processors or on a large system. The same people, including students, will be able to access the library central catalog, a project now in progress.

Individuals or departments will be able to run microcomputer community bulletin board systems.

Electronic mail will allow reduction of the large amount of internal memoranda. Using laser video disk machines controlled over the network by any of the computers greatly enhances the possibilities for computer-assisted instruction. Already, faculty and staff are planning to have their micros talking to one another without the intervention of central systems.

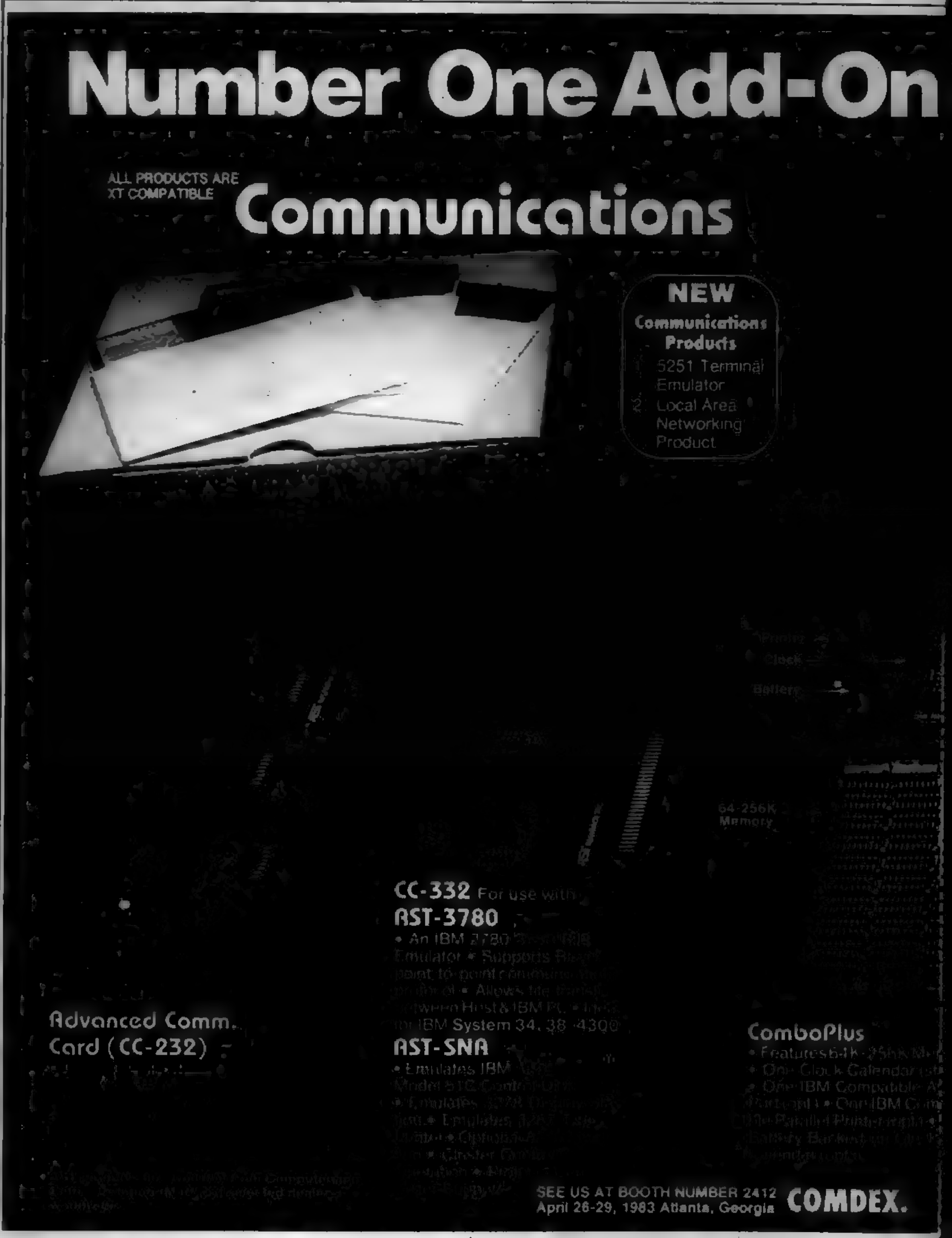
It is quite possible that virtually any computer on the system, from micros to the mainframes, will be able to use central, high-speed printing services. The current plan is to use the same remote job entry devices for high-speed output for both the VAX machines and the IBM-compatible systems, possibly routing output from the VAXs through an IBM software subsystem called RSCS.

The cable system went on-line in mid-February 1983 although a development network was running for several months prior to the inauguration of the full system. Most of the projects mentioned are either completed or under active development.

A major issue not successfully confronted is the wide variety of operating systems and communications software available on the microcomputer market. An attempt is being made to partially standardize on Digital Research, Inc.'s CP/M. This has been helpful where applicable, but there are no general-purpose communications programs for use on micros that provide a common ground — even among CP/M users.

Also, the support of XON/XOFF flow control is extremely limited on micros. As time permits, therefore, North Texas University is developing communications programs of its own.

Madron is manager of academic computing at North Texas State University, Denton, Texas.



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From Centralized Environment

Managing the Move to Distributed Processing

By Charles M. Robins
Special to CW‡

Several trends are pushing the computer industry toward distributed mainframe-to-microcomputer processing, where a host mainframe acts as a central site for data and operations and microcomputers offer responsiveness, flexibility, availability and integration into day-to-day office environments.

The problem facing DP organizations is how to manage a smooth evolution from totally centralized processing to distributed processing. Disjointed local word processing and spreadsheets solve only a part of the needs of users who must also be able to move data to and from a host computer, interact on-line with a host computer and integrate to local processes.

Networking architectures and software are finally reaching maturity. IBM's Systems Network Architecture and X.25 for long-range networks, Xerox Corp.'s Ethernet, other broadband technologies and T1 satellite technologies are allowing greater coordination, control and movement of data.

These three technologies combined with increased end-user sensitivity and desire for local processing call for the resurgence of the mainframe computer, now tied into local microcomputer power. The mainframe allows all the advantages of Phase II centralization, and the micro allows the responsiveness of Phase III minis (assuming shared resources).

Terminal emulators that turn a powerful local microprocessor into a dumb terminal and put local processing out of reach of a host session will not be adequate in the '80s. An integrated distributed processing system will be an increasing requirement.

Other software components needed on a distributed microcomputer include report writers for reporting locally on data moved downstream from a host; record handling with a subset selection capability to pick out a desired set of records based on selection criteria; data analysis and aggregation allowing analysis and totaling on a subset of data; graphics interface; data and file maintenance to categorize, track, move, delete and update files; and an on-line documentation/tutorial system to maintain documentation and other information for local applications.

'Bells and Whistles'

End-users increasingly expect such functions, the so-called "bells and whistles," on all applications. Yet developers no longer have the expertise or time to provide all these functions in increasingly competitive environments.

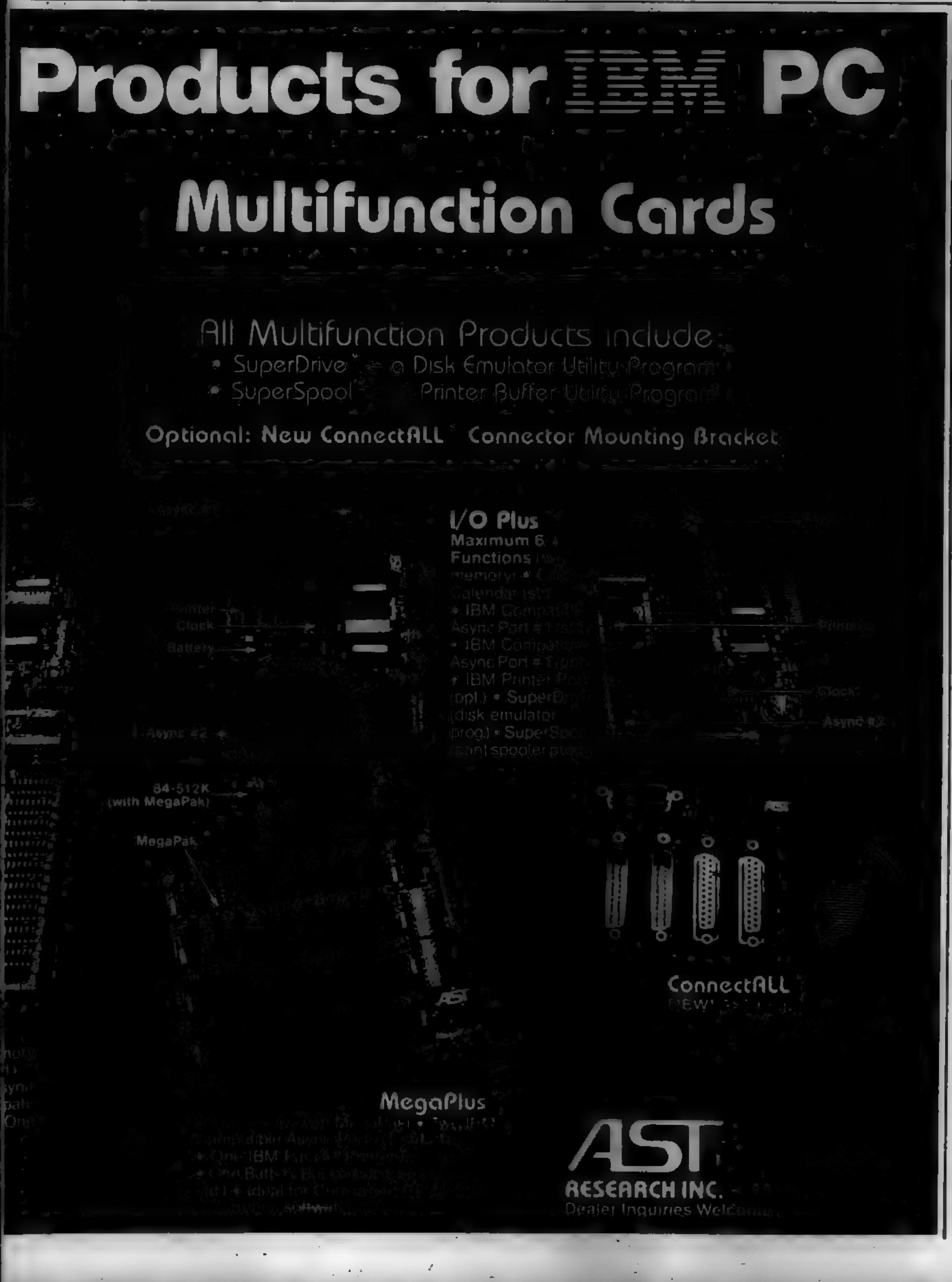
"Vertical" business applications such as accounting systems are increasing in number and are more often being written by people with business experience rather than software expertise. Even development departments in larger companies can no longer be expected to design all the tools needed for increasingly varied and complex departmental applications. New-generation software is needed to provide "horizontal" functions that are general in nature and that can solve the needs of many business applications.

A popular approach to generalized software of the '70s is the data base management system (DBMS). While suitable to some applications and good for general functions, DBMS does not meet the needs mentioned above. There is too much complexity and change and too many varied needs and uses for one generalized system to perform all needed functions flexibly and efficiently, especially with the increased demands placed by on-line, distributed environments, changing technology and demanding end users.

An approach is needed that will allow application builders and users to integrate needed functions or components. Each component becomes a separate, generalized but specific function and is designed and optimized both to solve the problem and integrate into other components. Certain components handle host communications and data movement and others handle reporting, analysis and data input. As new technology emerges, such as voice synthesis and recognition, new components are needed and optimized for performance, ease of use and ease of integration into existing applications.

These components have the positive effect of insulating applications and extending their life cycle by adding a layer between them and the computer's operating environment.

(Continued on SR/38)



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Software for Micro Integration Still Catching Up

Despite recent advances in hardware, operating system and communications technologies, there are still problems facing users wanting to integrate their microcomputers into larger computer systems.

One critical void is the lack of general software designed specifically for integrating micros into larger systems. There are four primary categories of such software on microcomputers.

- *Distributed Processing Systems.* Software dedicated to terminal emulation, data movement both to and from a mainframe in an on-line mode, batch communications and file transfer and interaction between processes running on host and micros.
- *Data Handling and Presentation.* Software dedicated to report generation, data dictionary, data analysis, graphics, file tracking and maintenance.
- *Data Collection and Screen Handling.* Data input, editing, translation and table lookups, as well as special screen functions such as split-screen capabilities.
- *Other End-User Aids.* Tutorial aids, office automation software and security systems.

To illustrate these issues, consider, for example, a typical on-line IBM environment in which IBM 3270 terminals and protocols are tied into an IBM mainframe such as the 3033 or 3081 or into a minicomputer like the 4341, usually via CICS or TSO. These terminals are connected to a controller that allows sharing of a single communications line between many terminals. The DP department would like to replace terminals with local microcomputers. This leaves the DP department with two primary needs. First, the DP shop must use microprocessors to its best advantage without disturbing existing IBM applications. Secondly, it is necessary to evolve to integrated processing for future applications (or with minor changes to existing applications).

It is unrealistic to expect a DP department to change applications initially to take advantage of new features, but it will be critical in the '80s to allow migration to distributed utilization.

Functions for Integrating Micros

There are a variety of functions that can be used to help integrate micros into a larger host network. A synopsis of functions that support such migration is given below:

- *Complete IBM 3270 Cluster Emulation.* The microcomputer should be compatible with an IBM 3270 terminal and should allow line sharing and local resource sharing. Surprisingly, many emulators lack key functions such as 24-function keys, cursor-select capability (for light-pen fields) and appropriate keypad and attribute handling.

Also, many stand-alone micros do not cluster. Most 16- and 32-bit micros solve this problem by resource sharing or by connecting several terminals to one microcomputer. Printer support to local, preferably letter-quality printers, is very important, as is a copy (screen-to-printer) command.

- *Movement of Host Data to Local Files or Processes.* The simplest such interface is a screen-to-file command to move a screen image to a file for immediate or later processing by a local application. Background 3270 processing allows a local process to access — or request — 3270 screen images.
- *Further Integration of Local Processing.* These functions increase responsiveness by moving data capture closer to the end user. This includes local screen processing and data entry functions to cap-

(Continued on SR/40)

Managing the Transition To Distributed Processing

(Continued from SR/37)

communications and end users. This layer also acts to increase transportability, assuming that software components are available on multiple machines.

Rewriting applications software often will no longer be acceptable, as will recalling software used by thousands of users due to errors caused by complexity and lack of testing. By dividing applications into vertical and horizontal components, problems are reduced, especially if horizontal components are not the responsibility of the application developer.

In the future, all microcomputers will be provided with a full array of software subsystems.

Robins is vice-president of software development at Rabbit Software in Malvern, Pa.

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Speeds Distributors' Communications

Information Company Develops In-House Net

GLENVIEW, Ill. — For several years, Zenith Data Systems Corp.'s Information Systems Department (ISD) had been looking for an inexpensive way to communicate sales, inventory, shipments, order entry and messages among its North American distributors.

About 10 years ago, the ISD sales and marketing group entertained the idea of such a communications network, but the cost of implementing such a system was prohibitive — a minimum of $15,000 for equipment per site plus monthly transmission charges of more than $300 per location.

Information exchanged between Zenith Radio Corp. and its distributors included reports on sales to dealers, product inventory, replacement parts orders, shipment notifications and credit claims. The information was carried via the U.S. Postal Service, telephone, telegram, mailgram, telex and messenger services.

Idea Revived

The network idea was revived almost 10 years later. Several factors had changed since the 1972 study. In 1979, Zenith Radio purchased Heath Co., a manufacturer of desktop computers.

The next year, GTE Corp. introduced its Telemail electronic mail network to the marketplace.

These two technologies presented a situation in which the equipment costs for such a system would average less than one-third the 1972 estimates, and transmission charges would average one-tenth the 1972 estimates. This offered a much more feasible approach to Zenith's communications needs.

Thus, a communications system was conceived that allowed the use of Zenith Data Systems (Heath) microcomputers, a stand-alone electronic word processor and GTE's Telemail.

The concept was presented to Zenith's Distributor Council, a group of distributors that met once each quarter to discuss Zenith's distributor needs. The council endorsed the idea and suggested that all distributors be polled to determine overall support. A poll was taken and 100% participation was achieved.

After the system was written, each of the distributors purchased their equipment, and Zgram, as the system came to be called, was implemented in January 1982.

Closely following the Zgram implementation, a sales and inventory system was implemented to manage the distributor's sales and inventory. Using Zgram, Zenith was provided with sales and inventory figures on a weekly basis, which involved the electronic transmission of the distributor's sales and inventory data to Zenith's corporate computer center.

There, the sales and marketing systems digested the data and produced corporate management reports each night that formerly required an additional two weeks to obtain.

All parties benefit from this setup. The distributors are no longer required to hand-transcribe sales and inventory data on a form and mail it to corporate headquarters every week. The transcription involved 300 models and 11 fields for each model, not to mention the row and column totals. They have an electronic word processor that significantly reduces their typing require-

(Continued on SR/40)

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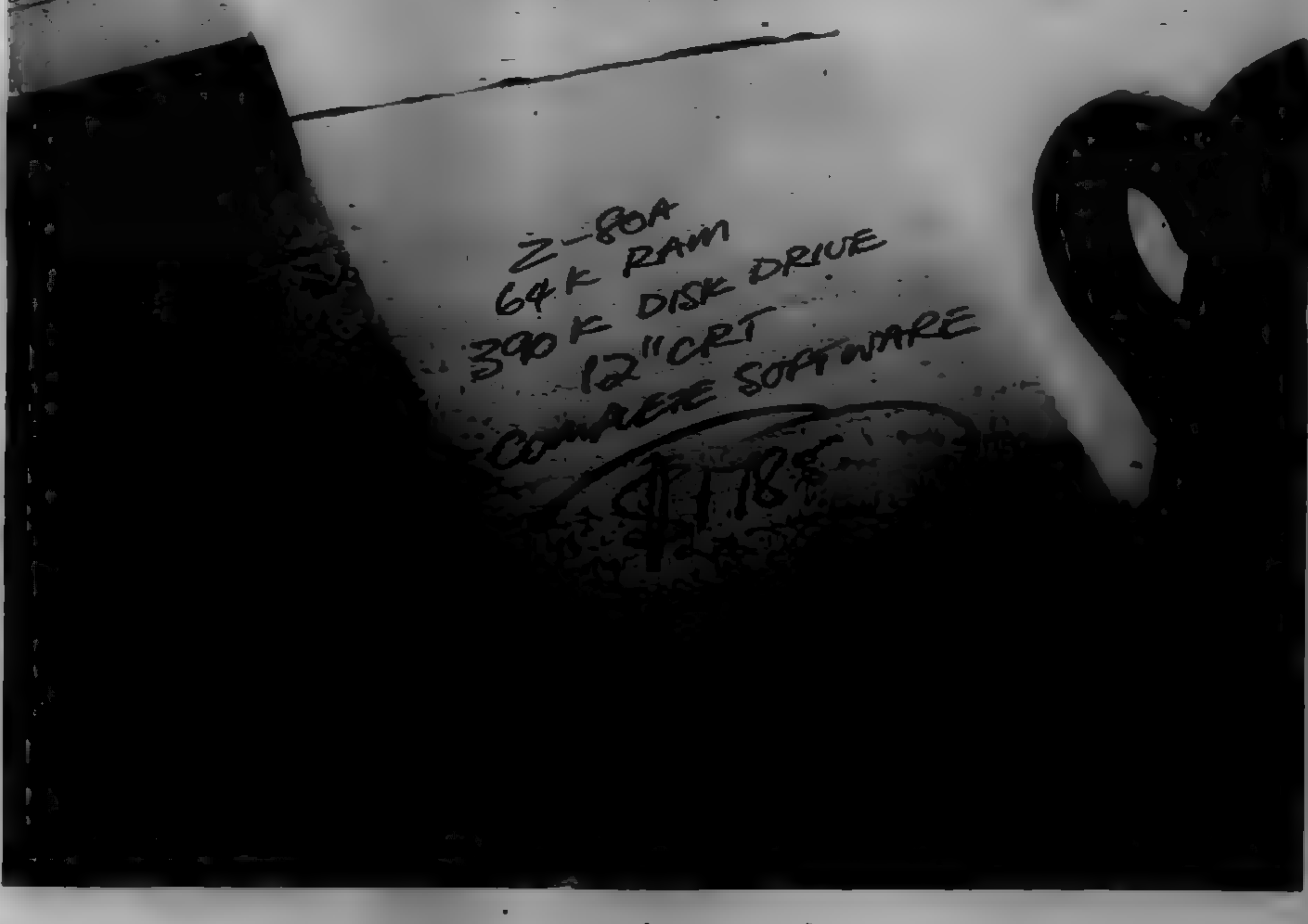


Information Company Develops Net In-House

(Continued from SR/39)

ments, along with a fully capable microprocessor that helps them run their businesses.

With additional software that is purchased at the corner computer store, distributors handle payables, receivables, invoicing and accounting systems.

Zenith corporate headquarters shares the ability to communicate immediately and in an extremely reliable manner with all the distributors.

The corporation has realized $50,000 in annual savings just with the transmission of the sales and inventory data.

There is no more keypunching, no more forms and no more data handling requirements for the corporation.

A Variety of Functions for Integrating Micros

(Continued from SR/38)

ture and edit data before passing it up-line to the host computer.

Another key function, suspend/resume, should suspend temporarily a 3270 session to a host on the micro with the host still engaged and printers still operating and then restarted. This would, for example, enable the operator to browse through host data, move screens to a local file and then suspend the session to run local processes such as word processing; a local process could also look up a record or file and then resume for data input.

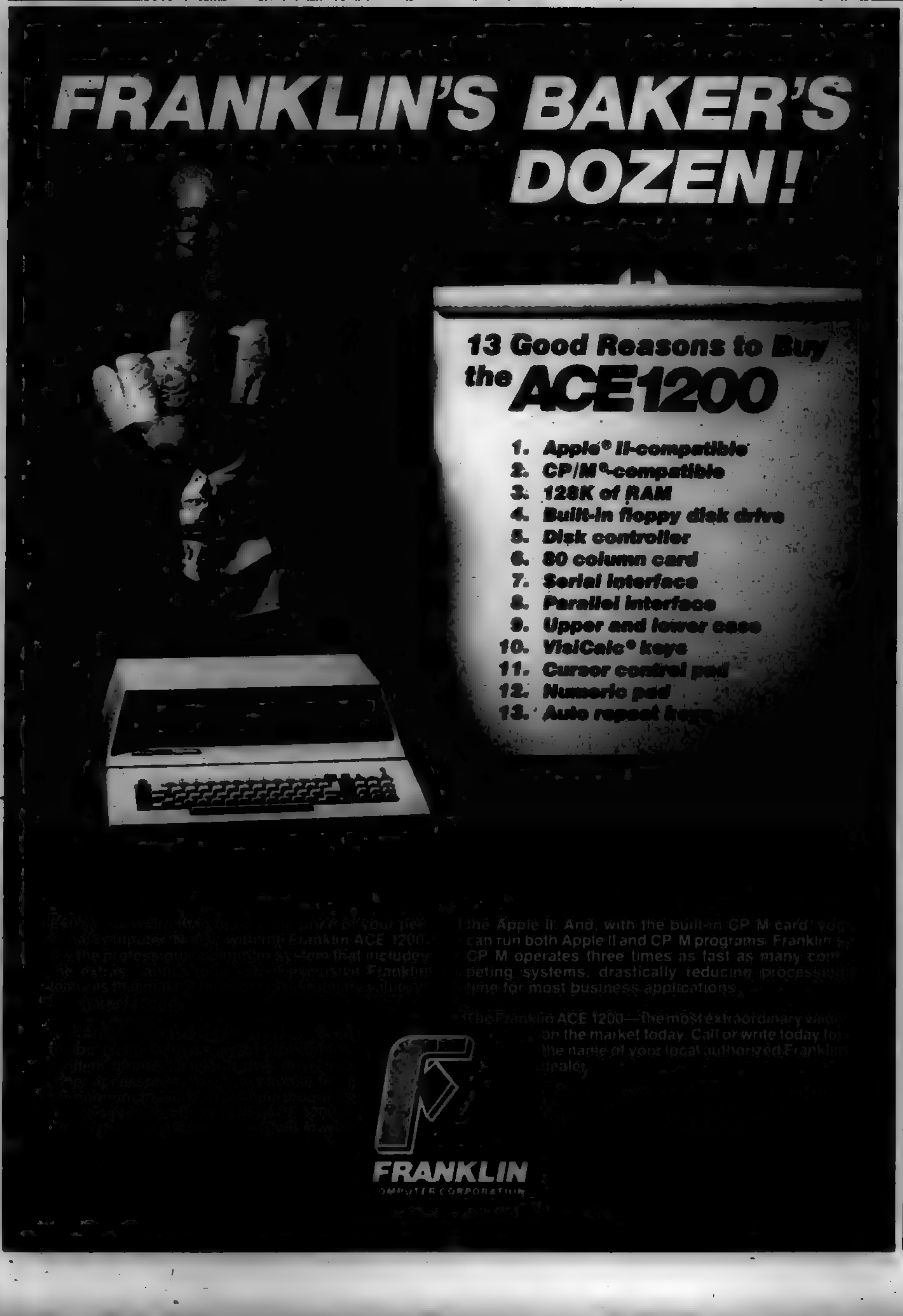
Split-screen 3270 would allow a 3270 session to occupy half of a screen and leave the other half for local processing or two simultaneous sessions can share a screen.

Host transaction access would allow a local process to access host data as if from a local file. A local "dictionary" would translate the request for data into an appropriate input to the host, receive appropriate screens and package and translate the data for the local application.

For example, a local application might request an employee number and gain access to a host employee record for display. It might then capture further information locally and use the aforementioned local transaction processor to pass results to the host or process locally.

• *Other Enhancements.* Other enhancements include automatic logon, recording of host sessions (a training and testing tool) and line utilization diagnostics.

For responsiveness, screen look-ahead would request the "next screen" from a host for "reporting" screens (those with no inputs), while a current screen is under review. When the local user requests a next screen, look-ahead will effect a reduction in response time of several seconds.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To Avert Potential Problems

Micro Installation Requires Careful Planning

By Dale Neibaur
Special to CW‡

The unplanned installation of personal computers can create as many problems as it solves. Vital information can be locked into one computer, unavailable for use by others. Related pieces of information may be spread throughout many diskettes or computers, making it nearly impossible to extract meaningful summaries or keep accurate tally of inventories and business transactions.

Carrying information by hand from computer to computer is at best a tedious, ineffective remedy and may fail if computers from more than one vendor are used. Diskette and file formats vary widely from computer to computer and from operating system to operating system.

The effective use of two or more personal computers in a business environment requires that the computers share information easily and efficiently. This is the purpose of a local-area network.

'Information Conduit'

Traditionally, a network acts as an information conduit, allowing users at any computer attached to the network to access information stored at any other networked computer. But in the personal computer world, this traditional solution has several major drawbacks. The first is the personal computer itself.

Personal computers have been designed as "single-user" systems. Their operating systems are small and simple, having been designed for use by one person at a time. These operating systems cannot handle multiple requests for different data from several sources at once. They also cannot handle the partitioning of data among multiple computers to assure data integrity when multiple stations try to use the same file.

These operating systems could be rewritten, but they would be much larger. Many personal computers have limited memory, all of which must be available for the user's software packages to work. Also, most personal computers use floppy disks, only a few of which will be actually loaded into the computer at any time. The computer has no way of knowing what is on disks not loaded and thus cannot make that information available to other stations, even though it may be critical information.

Placing Winchester disks or other hard disks at each personal computer could alleviate this problem, but could also rapidly increase costs.

One of the major advantages of personal computers is their low price; this advantage should be exploited and not destroyed by a good network.

Finally, all data stored on the network may not be necessarily intended for all users. Security must be a major issue; certain information should be available only to certain people. But information security is hard to maintain when the data is

(Continued on SR/42)

Wide Range Of Local Nets To Explore

There are several types of local-area networks currently available.

The simplest local network consists of little more than wires connecting two or more personal computers together. Files may be transferred from one computer to another, but it requires a special program for files to be accessed from both computers.

This is little better than the hand-carried floppy — termed the "Adidas Net." The next best alternative is a simple network disk. In a simple network disk approach, simple network disks are physically partitioned into multiple floppies, which are then available for use by various stations on the network. This approach centralizes the information on the network, but does not allow it to be shared efficiently.

In the simple network environment, the operating system of a networked computer has been modified so that physical disk access calls are routed to the network disk rather than to a local disk.

The personal computer still explicitly manipulates the physical disk and will have portions of it in memory. This means that two personal computers cannot simultaneously share one of the network floppies, because the directory and file information might become contaminated.

Furthermore, the information on the disk is tied explicitly to a particular personal computer's operating system. The data is not secure (anything may be read or changed by any programmer smart enough to request it) and may not be shared by different operating systems. Also, this approach limits file sizes and numbers on the networked hard disk to the sizes available on a floppy.

A step beyond the simple network disk approach is the shared network disk. A shared network disk resembles a simple network disk in that the disk has been divided into multiple floppies that are available for general use on the network. Again, the networked personal computers' operating systems have been modified to make physical disk calls to the network disk. In addition, synchronization mechanisms have been added to allow one personal computer to lock the directory portion of the disk

(Continued on SR/42)

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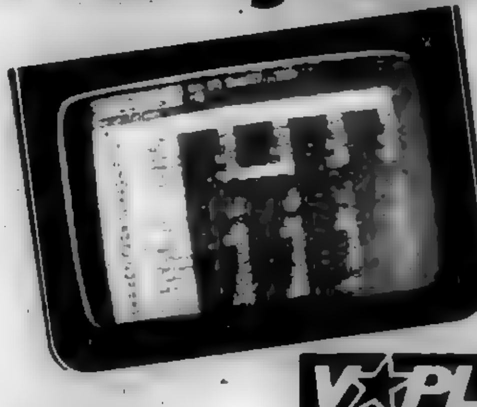

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Micro Integration Can Prove Awkward Task

By Deryk Van Brunt
Special to CW

The microcomputer became an important part of business very quickly. Unfortunately, integrating these machines into existing DP departments has so far proved to be an awkward task.

The very nature of distributed computing conflicts with the existing, centralized approach many DP managers have supported for some time. Problems of system security, data incompatibility and hardware reliability are beginning to surface.

End users are enthusiastic about the personal aspects of microcomputers. However, users expect the same kind of support they traditionally receive from the DP department for existing systems.

The key to managing microcomputers in a large organization is networking. Users expect reliable backup for their data, and they expect their data to be interchangeable with programs on various machines.

Moreover, the need for access to large-scale peripherals such as tape drives, fast line printers and large mass storage devices will most likely increase. The only solution to those problems is networking.

Networking Techniques

There are a number of networking techniques for integrating microcomputers into existing DP operations. Most of these, such as Xerox Corp.'s Ethernet, are local-area networks that treat the microcomputer like a node. The basic concept behind local-area networks is that data moves throughout the network in packets that are passed to the appropriate device.

The advantage to this approach is once the network has been developed, adding

(Continued on SR/46)

Exploring Options in Local Nets

(Continued from SR/41)

while changing it; thus, more than one networked personal computer can share the same network floppy.

In some cases, file locks have also been provided to allow a modicum of file I/O synchronization among stations. This method allows more than one station into the same network area, but does not allow sharing of data among different operating systems or machines because the network data layout is still tied intimately to the personal computer that created it. Similarly, this approach shares the lack of data security and floppy limitations of the simple network disk.

Beyond the shared network disk is the information management computer. This computer manages its own disk resources, keeping files and directories in a consistent internal format that is not accessible to the networked personal computers.

The computers on the network do not directly manipulate the disk; instead, they make logical file I/O requests to the information management computer. Full information security is maintained. Multiple computers may be in the same directory areas simultaneously; the information management computer handles all directory activity and ensures that the directory structures remain valid.

The networked computers may share directory areas and files even if they are running different operating systems. Shared file access may also be coordinated through the information management computer. Communications pipelines are provided between networked computers and synchronization is supported. Networked personal computers' operating systems are left intact, allowing a user a full choice in adding peripherals to his networked computer. Information management is facilitated; modular growth is supported.

Thus, the full advantages of personal computing are realized without the attendant loss of information security and cohesiveness.

Unplanned Installation of Micros Can Result in Unplanned Problems

(Continued from SR/41)

physically stored in a personal computer, and all computers on the network must have duplicated security information. Also, if a personal computer is turned off while another user is accessing the information on it, the information will become unavailable.

Total data sharing among personal computers on a network is therefore impractical. The micros are not designed to simultaneously share data; they also have limited resources, lack adequate data security mechanisms and may be turned off at any time.

The solution is to connect an information management computer to the network and let this computer handle the intricate task of parceling information to the various computers as they request it. Winchester disks can be attached to the information management computer and will store all the information that should be shared among the various computers attached to the network.

Individual personal computers still may have their own local floppy or hard disks if desired. These drives will hold information that is not available on the network. Local drives are not required since a networked personal computer can get all of its information solely from the network.

The network information management computer itself must be a sophisticated machine able to meet rigorous requirements, for it must make up for the sharing capabilities that various personal computers lack. It must be able to handle many megabytes of disk storage.

The directory structure on these disks should allow maximum user-flexibility and ease of use; a hierarchical or tree structure is recommended.

The information management computer should enforce security restrictions by user. Users should log into the network and be granted access to appropriate portions of the total information available.

This security system should be very secure and should be unbreakable from a personal computer on the network.

Data on the information management computer should be accessible transparently from a networked personal computer. To the user, the data should appear to be stored locally. This allows the user to work normally and also means that "off-the-shelf" software can be purchased and used on the network without modification.

Finally, the information management computer must be very fast and very reliable since all network data requests are routed through it. Network performance should not significantly degrade as more users are added.

Neibaur is a systems software consultant at Novell Data Management, Inc.

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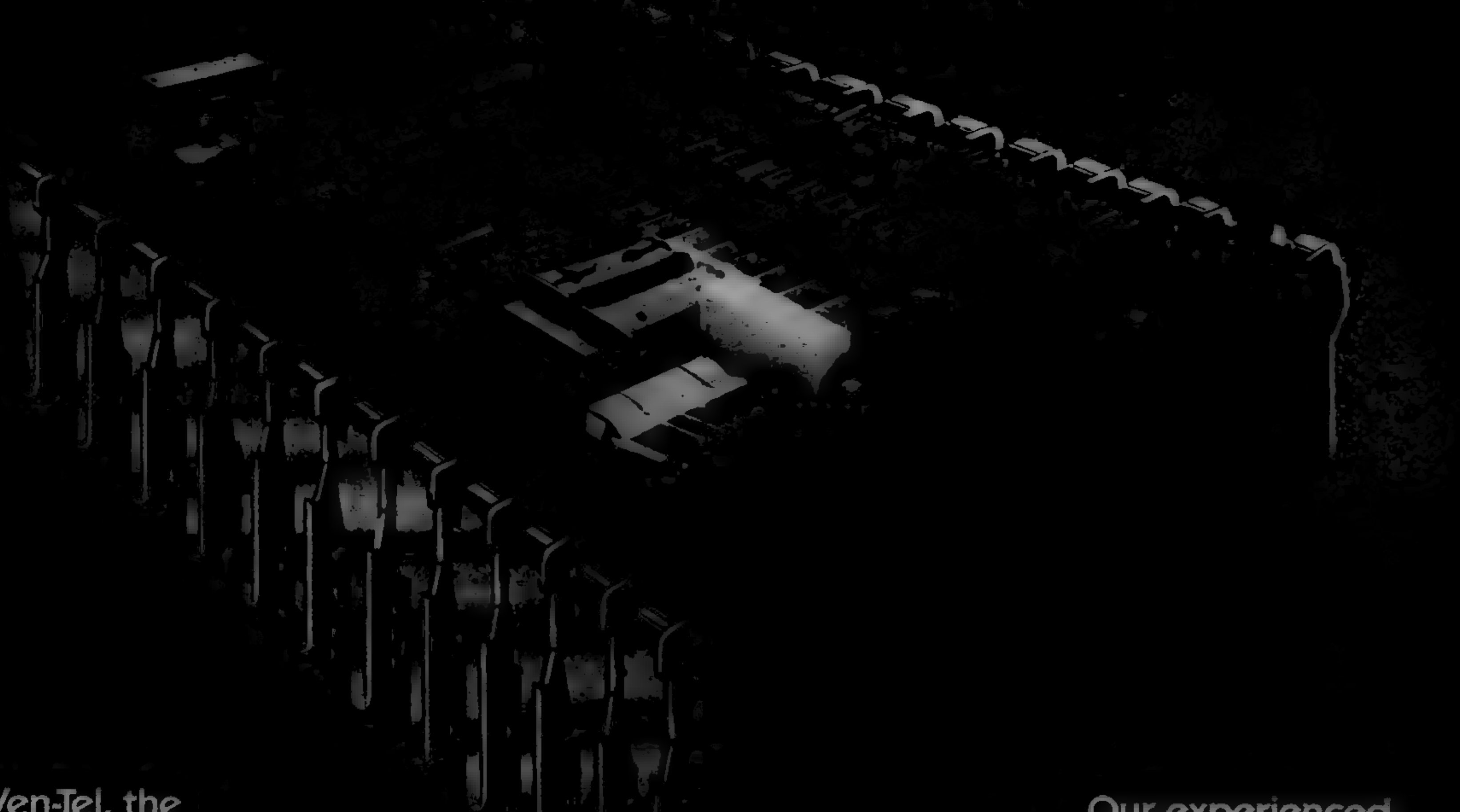

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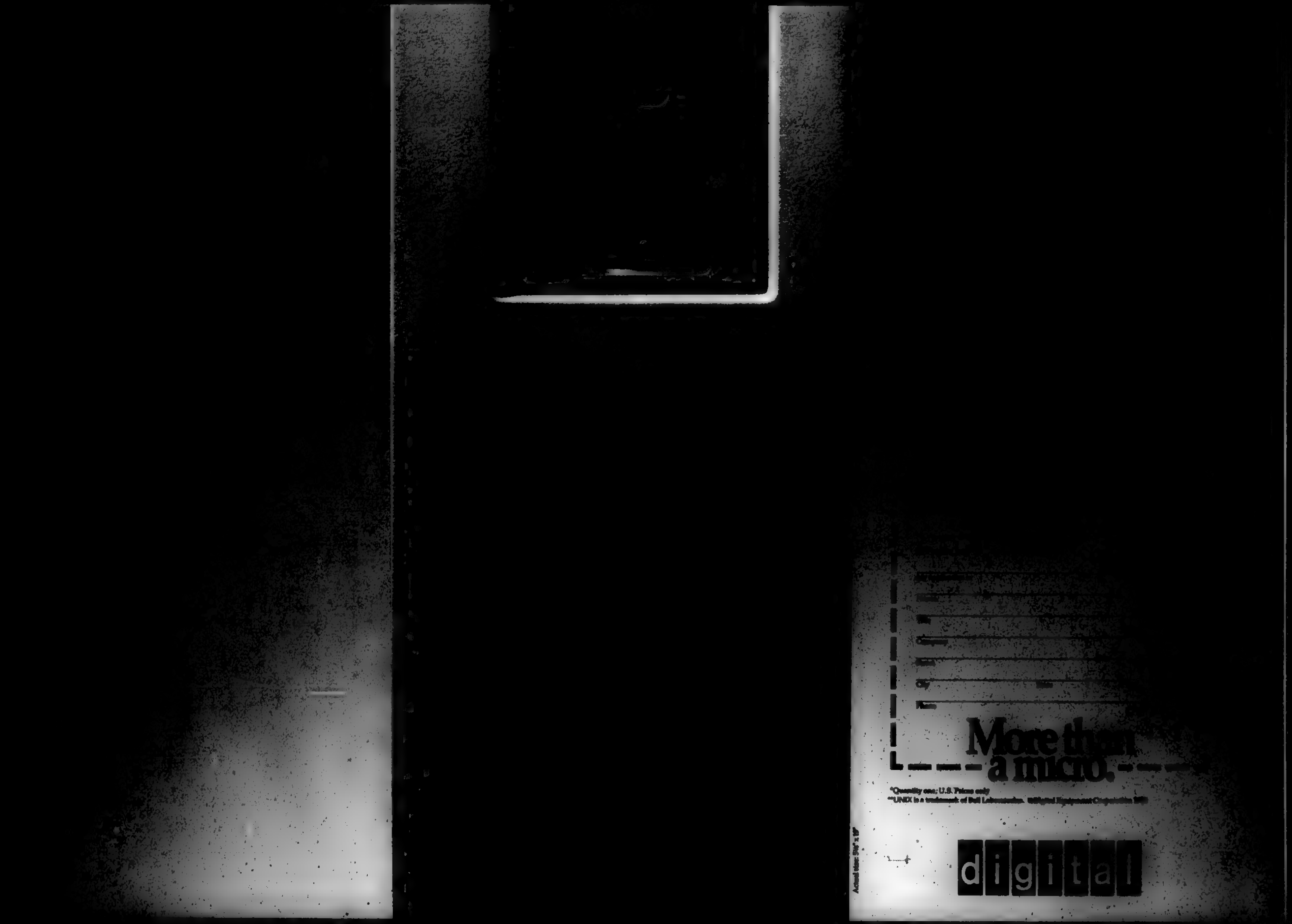

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Can Micros Mix With Business Environment?

(Continued from SR/42)

more machines is relatively straightforward, and users are able to communicate information without great difficulty.

The problem with local-area networks, however, is that microcomputers remain decoupled from the more stable, professionally managed DP environment.

That means users will not be able to access easily large system peripherals.

In addition, maintaining system security is a challenge. Physical control of floppy disks is difficult, and the user does not have direct access to a minicomputer-based operating system. Instead, each user has to make do with the support offered by the local operating system and any resources available through the network.

One solution to the local-area network problem is to develop a virtual microcomputer system that has networking inherent in the existing terminal network already supported by the host processor.

In this case, the microcomputer can access all the system peripherals, such as disk drives, line printers and tape drives, and can serve as a microcomputer when needed.

Another important theme in integrating microcomputers into larger systems is making sure there is a provision for RS-232-based file transfer.

As microcomputer networks grow, there will be an ever greater need for moving information and programs from isolated machines to other environments.

To accomplish this, there are a number of choices open to the DP manager. There are many software packages on the market that support communications between two microcomputers. One of these packages could be used to move a program. This program could then be used to transmit the program to any microcomputer on the network.

Full Advantage

Fully integrated microcomputing, either on a local-area network or by virtual approach, will be necessary to take full advantage of microcomputers in big business.

Microcomputing economics will be primarily a function of peripheral costs.

Microcomputers typically cost $3,000 to $4,000 without a line printer, hard disks or other "big" peripherals. Users will require access to these devices, which can only be provided on a shared basis.

This capability is inherent in the virtual microcomputing approach and is quite feasible through a local-area network.

In either case, the cost of providing access to large-system resources will be a small fraction of distributing these expensive peripherals.

The challenge facing DP managers is how to integrate micros into their DP operation while continuing to manage information processing in a professional manner.

Van Brunt is a sales manager for Virtual Microsystems, Inc. in Berkeley, Calif.

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Security, Access Problems May Arise

Moving Micros to Business Only Half the Battle

By Dale Neibaur
Special to CW‡

The microcomputer revolution is upon us. Hardware costs have dropped to the point where most small businesses can afford a micro.

But just bringing microcomputers out of the hobbyist's basement and into the office is not enough. Many problems can arise from the move to micros. For example, if one person is not in the office, vital pieces of information can be locked away in a microcomputer, unavailable for use by others.

Diminutive physical size makes the computer less imposing; people seem more willing to use a machine when they control the power switch. Businesses and individuals are simultaneously pulled by the lure of low-cost information processing and pushed by the necessity for a competitive business advantage into buying and installing large numbers of microcomputers.

Likewise, pieces of information that are essential to completing a given project can be spread across many systems. That makes it very difficult to extract meaningful summaries or keep a meaningful tally of inventories or business transactions.

Some organizations resort to carrying information by hand from one system to another. That method is tedious at best. Other users do not even have that option since they have incompatible systems.

In most cases, microcomputers were designed as single-user systems. Their operating systems are small and simple, designed for use by one person at a time. In addition, most microcomputers use floppy disks. The problem with floppies is that only a few can be loaded on the system at a given time. The processor has no way of checking on information that is not loaded on the system.

> *'Security is a major issue that is made even more complicated by multiple microcomputers.'*

Some users have turned to Winchester disk drives to alleviate this problem; however, costs start rising when users have to add extra peripherals.

Many people believe the solution to these problems is a good networking system, but that is often easier said than accomplished. There are questions about networking that must be addressed. For example, not all data stored in a network is intended for all users.

Security is a major issue complicated even more by multiple microcomputers. Also, when the microcomputer holding information is switched off, the information will become unavailable to all other users.

Total data sharing among microcomputers on a network is impractical. The units were not designed to share data simultaneously. Microcomputers also have limited resources, lack adequate data security mechanisms and may be turned off at any time.

An alternative is to connect an information management processor to a network and allow that unit to handle the intricate task of parceling information to the various processors as it is requested.

> *'In most cases, microcomputers were designed as single-user systems. Their operating systems are small and simple, designed for use by one person at a time.'*

This information management processor can be attached to a central bank of Winchester disks that store all the information supposed to be shared. Individuals can still have their personal floppy disk drives for information that does not have to be available to multiple users.

The network information management processor must be a fairly sophisticated machine. It has to manage its own disk resources and keep files and directories in a consistent internal format that is not accessible to the networked microcomputers.

The directories used on the information management processor should allow maximum user flexibility and ease of use. A hierarchical or tree structure is recommended. In addition, the information management processor should enforce security restrictions by the user. That is, users should be able to logon to the network and be granted access to the appropriate portions of the total information available. This security system should be very secure and should be unbreakable from a microcomputer on the network.

In addition, the micros in the network do not directly manipulate the centrally stored data. Instead, the micros make logical file I/O requests to the information management processor. In this way, full information security is maintained.

Furthermore, since multiple processors may be in the same directory areas simultaneously, the information management processor must handle all directory activity and ensure that directory structures remain valid. The networked computers may share directory areas and files even if they are running different operating systems.

Shared file aceess may also be coordinated through the information management processor. Since communications pipelines are provided between networked microcomputers, the micros' operating systems remain intact. This gives the user a full choice of peripherals that can be attached to the system.

By using an information management processor, data management is made easier, modular growth is possible and the full advantages of personal computing are retained without losing information, security or cohesiveness.

Neibaur is a systems software consultant with Novell Data Management, Inc.

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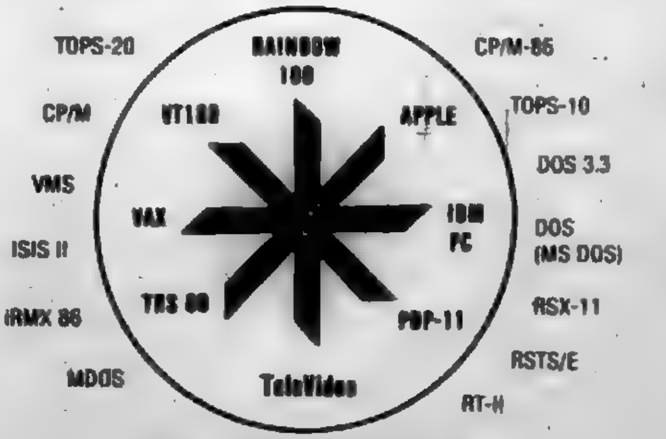

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Integrated Net Allows S&L Group to Expand

SAN FRANCISCO — A large savings and loan institution searched for a means of combining its several different communications networks, each with a unique communication protocol, to accommodate its growth by expansion. California Federal Savings and Loan Association wanted to do this in a timely and cost-effective manner while still providing the good services their customers were used to receiving.

According to Marc Feldman, management systems group, the immediate problem was to sort out a maze of overlapping needs, equipment and communications lines. "The situation as it existed required a multiplicity of networks. We had a teller terminal network. We were facing automated teller machines. We had an administrative terminal network, and we [were beginning] to install a hard-copy terminal network. And, we also had a point-of-sale terminal network. We actually had five independent networks in place."

Bill Alaoglu, assistant vice-president, management information systems division, said: "We had problems every step of the way. We had different protocols, different modems, different line speeds and types, different interfaces to our computers, real problems with maintenance and service and reliability. With that many lines and with those old-fashioned protocols, we had no way of arranging backup or intelligent monitoring of the network."

The proposed solution was something that California Federal named Integrated Communications Networks (ICN). The name derived from the fact that it proposed to take the same five networks (and ultimately any future ones as well) and integrate them onto a single communications network.

Alaoglu continued: "I think the heart of the whole plan . . . as well as the goal we were trying to reach, was to run one phone line to each location to do whatever function or to offer any service required there."

In the 1960s, the savings and loans and other thrift institutions largely went on-line to provide immediate, up-to-date teller functions and instantaneous passbook service. "While banking institutions were talking about it, we at Cal Fed were trying to implement it — sometimes successfully and sometimes unsuccessfully. And we perceived that an ICN was required to keep us there."

"In the thrift industry, the products — savings and loan accounts — sought by the customers are tied intimately to the responsiveness of the organization's data communications network. Servicing these products for the customer must, however, be balanced by cost-effectiveness. In the last four years, the question of productivity and automation to achieve cost control has become a driving force," Feldman explained.

Protocol Differences

California Federal's systems group realized a number of problems would face them during design and implementation of the ICN. Among these were questions of protocol differences: The concept of ICN virtually demanded the use of the formal Sperry Univac protocol throughout the network. But the branch equipment had tremendous variance, such as bit/sec rates, synchronous vs. asynchronous as well as protocol differences. Addition of new equipment and services in the future would compound this problem. Another consideration was the installation and maintenance of communications lines to branch locations.

"In those days, we were initially looking at some sort of a device that would give us general transparency in the network. We knew a terminal controller had to have intelligence; in those days intelligence came in big boxes," Feldman said.

"But we could see that minitechnology was being replaced by microtechnology. The impact on our communications plan was significant: Instead of placing one substantial minicomputer controller in a branch to do all the required network and systems functions, we began to forecast a number of intelligent microcomputer workstations which could do much more of the job in more discrete units.

"Just as we were backing away from the concept of a minicontroller and its programming, the Kaufman Model 871 [from Kaufman Research Manufacturing, Inc. in Mountain View, Calif.] product was introduced; it is more specialized, but intelligent. It was capable of tying together our network without tying us to a specific teller terminal vendor, It didn't require a big box, or a monstrous programming commitment," Alaoglu said.

"I think this was the key for us: Kaufman does not have any terminal allegiance, such as IBM, [Televideo, Inc.], Uniscope or whatever. And

(Continued on SR/50)

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Series Supports Five Campuses

Micros Relieve CPUs' Work Load at College

ANNANDALE, Va. — Northern Virginia Community College (NVCC) here has managed to off-load some of the duties of its two IBM 4331 host computer systems by relying on a series of IBM Personal Computers.

The 36,000-member suburban Washington, D.C., college uses the 4331s and about 300 CRT terminals to support both academic and administrative functions on five campuses.

In addition, the school provides information services for two smaller colleges, the Lord Fairfax Community College and Germanna Community College, according to the school's coordinator of information systems planning, William H. Chambers.

Initial Caution

Until recently, NVCC was cautious about integrating microcomputers into its DP operation. Don Greenawalt, coordinator of DP services, encouraged the use of micros, but warned that "central data base integrity must be preserved, otherwise we begin to maintain duplicate files, which means duplicate effort. That is exactly the situation data processing services and the college want to avoid."

But in spite of the warning, several university departments are using micros. For example, Chambers said, the school's Extended Learning Institute (ELI) recently installed an IBM Personal Computer and an optical scanning device.

The Personal Computer will connect to a remote IBM 3276 control unit. This is accomplished by using an emulation board located in the the micro, which emulates an IBM 3278.

Chambers explained that ELI is using the Personal Computer to download data from the 4331 mainframe. The microcomputers can also be used to update centrally maintained files, including data such as a student's name, ID number, address and telephone number.

The scanner is used to store and record student test results on the Personal Computer. The test results are not sent to the mainframe, Chambers explained.

The system also was designed to eliminate the huge cabinets of file cards currently used to track each student's progress in completing assignments for individual courses, Chambers noted.

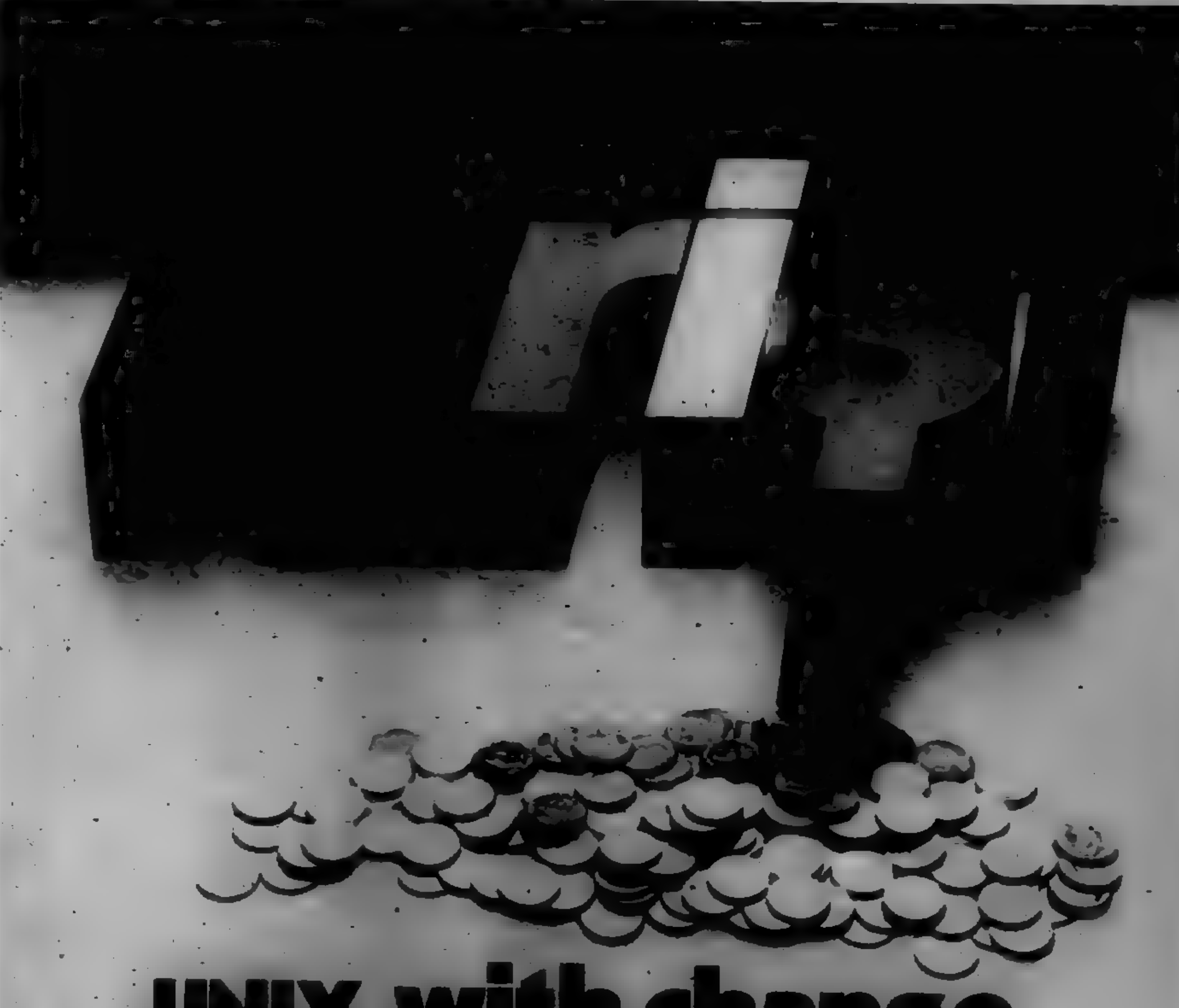
The Nursing Department also uses the Personal Computer. In that application, the system is used to assign about 300 nursing students to 17 possible clinical assignments in the Washington area.

Like the ELI system, the Nursing Department's Personal Computer connects to a remote controller (in this case, an IBM 3274). The controller is linked to the micro's 3278 emulation board via a coaxial cable, Chambers said.

In the nursing application, centrally maintained data is downloaded to the Personal Computer, where it is adapted into the department's unique format, which includes clinical experience history. The program is then used to help department administrators find the "best fit" between students and clinics.

The package considers aspects such as a student's requirements vs. a clinic's specialization and a student's available hours as compared with the clinic's require-

(Continued on SR/50)



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Micros Relieve CPUs' Tasks at Five Campuses

(Continued from SR/49)

ments, Chambers said.

To ensure central data base compatibility for the micro-based applications, NVCC uses software development procedures very similar to those used on the mainframe. For example, Chambers explained, users are required to develop (with the assistance of a systems analyst) a design document defining in moderate detail how the program is to perform.

This includes file layouts, display report formats and usage procedures. This document must be approved not only by the central DP technical staff, but also by a college management board, according to Chambers.

Looking down the road, Chambers said that micros may eventually play a significant role in office automation at NVCC. The college is currently working on a plan to integrate its word processing operations with data processing.

The school plans to develop a word processing solution that not only will use the existing communications environment, but will tie in with the mainframe for terminal emulation so that word processing units can act as terminals and support an electronic mail service, according to Chambers.

'But in spite of the warning, several university departments are using micros . . . The school's Extended Learning Institute recently installed an IBM micro and an optical scanning device.'

"We're looking for a device, be it a micro or word processor, which will inexpensively plug into our existing IBM 3276 or 3274 remote control units. The same device must also be a legitimate word processor with a clearly labeled keyboard with special function keys and secretarial-oriented word processing software," Chambers said.

The coordinator of information systems planning noted that the Wang Laboratories, Inc. line of microcomputers is one possibility for the school; however, the communications capabilities on the Wang processors do not fit NVCC's requirements.

Chambers added that the IBM Personal Computer, with 3278 emulation, fits into the communications environment, but the unit's keyboard design is inadequate.

S&L Expands With Network

(Continued from SR/48)

that is a key element from both an architectural and company planning point of view.

"The Kaufman product supports a large number of terminal types. Instead of being stuck with a controller that tied you to a terminal vendor, we have a communications controller that freed us to choose any type of terminal system we need. This was much closer to the original ICN concept and sort of a 'sweetheart solution,' " Feldman added.

"In the old days, we had about 250 devices in the field. Today we are talking about over 500 workstations. The concern then was how we were going to do this by suddenly changing everything and then what would happen to all the old equipment. The Kaufman 871 box or whatever solution was to be at the end of the line would allow us to mix the terminals. And the Kaufman box does. The Kaufman box, without tying us to a specific terminal, allows us mixed terminals and types of protocols."

Feldman said the Kaufman box turned out to have an extra bonus that really was not part of the original plan — device emulation or simulation totally distinct from communications.

"We were able to utilize a very inexpensive Televideo 950 terminal that, from the host's point of view, totally simulates a much more expensive Uniscope device. We got device emulation — free, if you will — in the solution," Feldman concluded.

Consistent Protocol

California Federal had made a commitment to use a formal Univac protocol as the consistent protocol in its network. In this way, it would not have to build constantly new interfaces to the CPU.

Currently, California Federal has about 120 Kaufman units installed in its branches, and it expects to add more as it continues to grow.

Regardless of the equipment California Federal anticipates using in its branches or in the network protocol — including UDLC, the Univac version of IBM's SDLC — it would have the single Kaufman terminals, which are key to the institution in making orderly changes.

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Different, More Complex Environment

Unix Offers Alternative for Business Micros

By Kenn Morris
Special to CW‡

Companies building microcomputer networks based on traditional microcomputer operating systems, such as Digital Research, Inc.'s CP/M, will soon scrap their systems because they are too old and too slow.

Bell Laboratories' Unix operating system offers a different, albeit more complex, way of implementing microcomputers in business.

One of the reasons Unix is a viable entity in the industry is that it is a proven commodity. For the first time in the history of microcomputers, there is a mature operating system that can run on microprocessors like the Motorola, Inc. 68000. In most other cases, vendors start with an established microprocessor and install a rather primitive operating system. The result is that usually by the time the operating system has reached maturity, the microprocessor has become obsolete.

But with Unix, it is easy to develop a new compiler to accommodate a new microprocessor. Since Unix is written in the C programming language, users can write all their utilities in the C language as well. In that way, a new state-of-the-art microprocessor can easily be adapted to run on Unix.

Users of a CP/M-based system like those based on Intel Corp.'s 8088 and 8086 microprocessors cannot easily upgrade CP/M. That means the user is stuck with a lot of limited and eventually obsolete hardware and software.

Some critics of Unix point out that the operating system was designed to run on machines that are unfriendly and not readily available. While those criticisms are valid, users are becoming more sophisticated and should be able to handle Unix on their micros.

For example, children today are growing up in a computer and video games environment. Therefore, they are not stigmatized when it comes to learning new technologies.

The first wave of microcomputer systems served a valuable purpose. But the age of nonexpandable systems has ended. Users now want to purchase more sophisticated systems, and they are prepared to adapt to more complex environments.

Morris is president of Callan Data Systems, Inc. based in Westlake Village, Calif.

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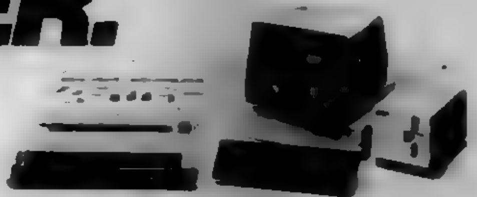

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Firm Solidifies Its Operations With Supermini

AMBRIDGE, Pa. — A building supply firm here has solidified its cement distribution business by using a microcomputer to monitor dispatching operations.

Beaver Valley Builder's Supply, Inc. supplies ready-mix concrete to the Pittsburgh, Pa., area. The concrete is blended and distributed by satellite batch plants, which are all managed by a Hewlett-Packard Co. HP 3000 superminicomputer located at the firm's central dispatch office here, according to DP manager Douglas A. Hagy.

A key to the distribution process, Hagy explained, is a batch ticket that defines the "recipe" for concrete. This recipe can vary depending on the customer's needs. For example, the batch ticket lists the moisture levels of each ingredient in the concrete. It also includes billing information, Hagy said.

Many tickets are transmitted daily, Hagy said, and the firm wanted a transmission method that would be fast, reliable and relatively transparent to users. Initially, Hagy said, the concrete firm used a system by which the satellite plants had a direct link with the HP 3000 processor via an autodial modem.

Dialing instructions were sent to the modem, and the HP 3000 sent data to the plant. However, Hagy said, this method had some problems. For example, there was a waiting period to allow the modem at the remote site to answer. Also, there was no guarantee there was still an on-line connection when the HP 3000 sent the information to the satellite site, according to Hagy.

The solution to this problem, Hagy said, was to develop a specialized microcomputer based on the Commodore Business Machines, Inc. 6502 microprocessor. Beaver Valley Builder's Supply called the unit an autodialer controller microcomputer (ADM). The HP 3000 sends dialing instructions to the ADM, which then

(Continued on SR/52)

Supports Broader Info Strategy

DBMS Provide Checks for Distributed Micros

By Brian Finneran
Special to CW‡

When an embarrassed New York City Councilwoman Carol Bellamy recently had to ask Mayor Ed Koch to drop a program she had fervently endorsed, it was because the net dollar savings to the city would only be in the thousands instead of the much-publicized millions. She cited a mistake in the base figures used for calculating the original estimate. To Bellamy's chagrin, when more current data was used, the drastically reduced savings were confirmed.

It appears that a similar scenario is occurring with increased frequency in many large and medium-size companies. A phenomenon being referred to as "Visisnow" (the projection of a figure-filled business case using questionable foundation data) is an epidemic that management inflicts on itself when distributed microcomputing is allowed in the enterprise. Decisions are made daily at every level of the organization based on such information.

While one might conclude that distributed microcomputing should be discouraged, the realities of information processing in today's world differ. It is far more sensible to take advantage of the state-of-the-art technologies and administrate their intelligent use. To permit, for example, the widespread utilization of microcomputers across the corporation without addressing the manner in which the information is handled and the transferability of that information is to invite a chaotic situation to develop. This is virtually unforgivable from a management point of view.

One of the tools that helps prevent such situations is the micro data base management system (DBMS).

The capabilities of the available micro-DBMS, although they vary by product, are very real. Their facilities at times rival those of their popular mainframe counterparts. Like the mainframe-DBMS, they support hi-

(Continued on SR/54)

Supplier Builds With Supermini

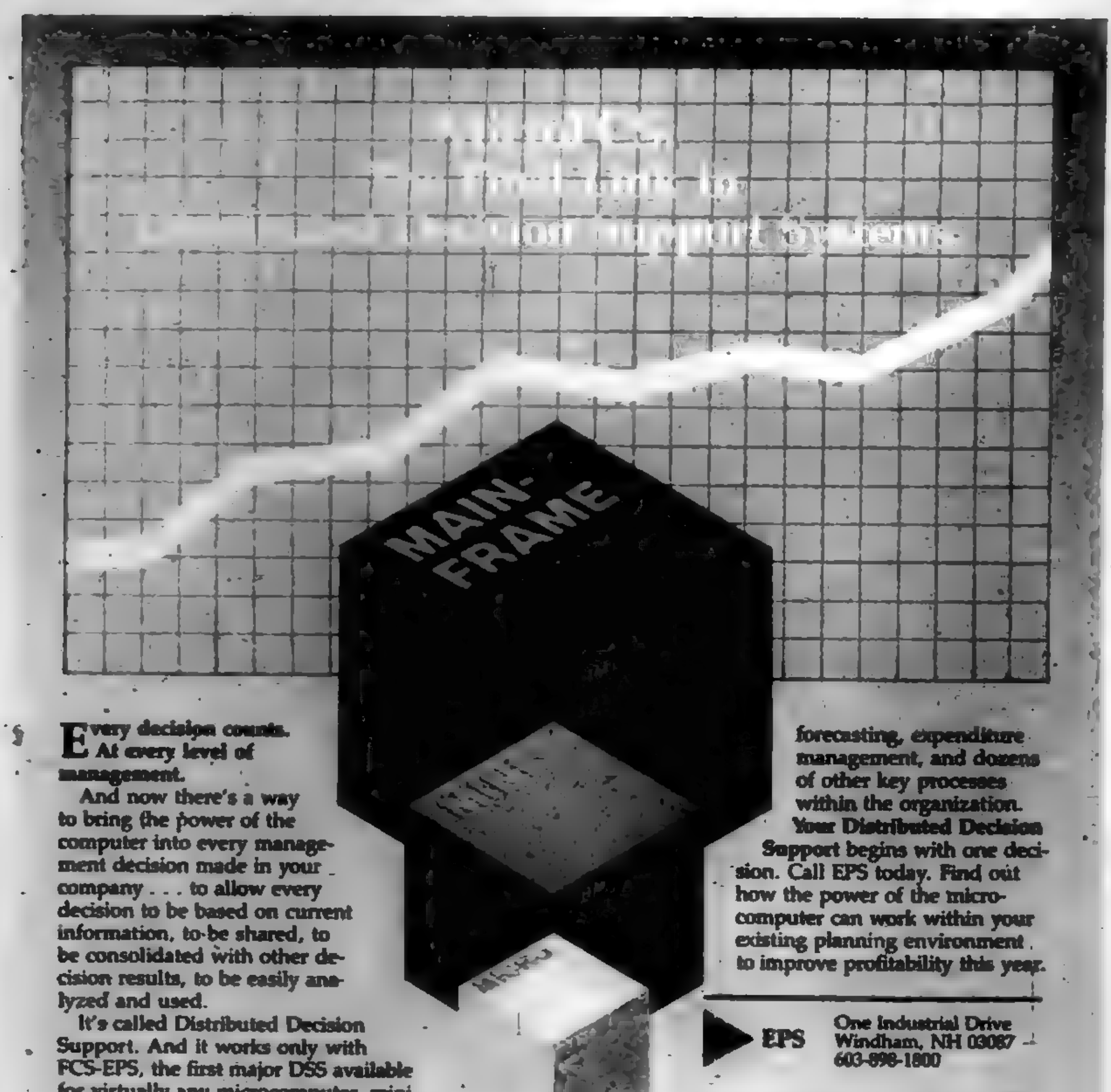
(Continued from SR/51)

assumes the responsibility of making an on-line connection with the HP 3000. By examining the electrical states in the modem, the ADM can determine whether the connection can be made. It then sends verification back to the HP 3000, Hagy said.

Once the on-line linkup has been achieved, the ADM becomes passive and allows bidirectional communication until the remote site "hangs up." Once the modem is electrically off-line, the ADM switches itself back to the data circuit, Hagy said.

Dispatchers at the site here are provided with a monitor that alerts them if the ADM cannot get on-line. Hagy said that the end result has been a self-diagnosing system that verifies the success or failure of a ticket transmission. The approach has eliminated the fixed waiting period by signaling the HP 3000 as soon as the on-line condition has been reached. This, Hagy said, has eliminated a large bottleneck in the firm's operation.

"We achieved a significant savings by using separate data lines for our local traffic and our long-distance traffic. Rather than tie up multiple serial ports with our data lines, we built a 6502-based software switch that allows the HP 3000 to route traffic to identically configured devices through a single serial port," Hagy said. He noted that while software switches are not a new idea, Beaver Valley Builder's Supply has a manual override that enables the firm to force all traffic through one line if another has difficulty. The software switch also has selectable traffic-control devices, Hagy said.



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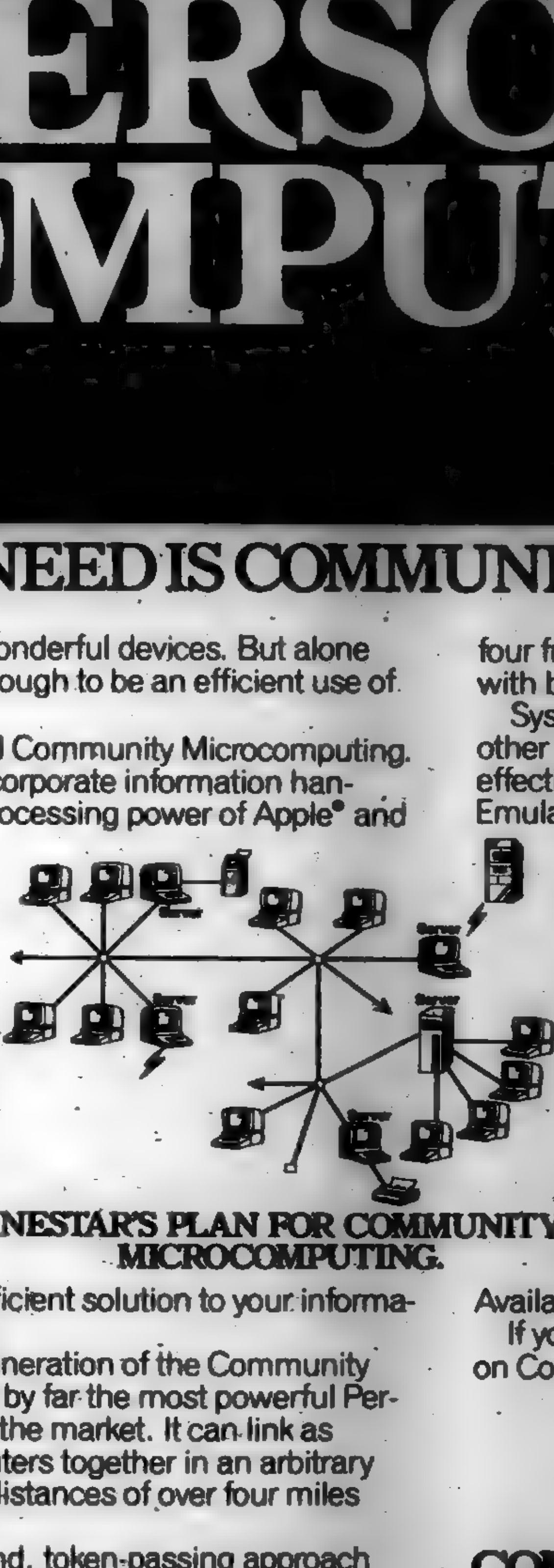

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DBMS Provide Checks for Distributed Micros

(Continued from SR/52).

erarchical, network and relational data and file relationships. Not only do they enable more to be accomplished on a single microcomputer, they have the potential of supporting a much broader information management strategy.

In most large and medium-size corporations, the time is right for such a strategy for the following reasons:

- Never before has senior management been so willing to be involved in achieving a synchronized information flow across the company's business functions.
- The management information systems/DP department is seeking to transform itself into a viable information center, supportive of "fourth-generation" tools and user-oriented applications development.
- The user departments are keenly aware of their informational dependence on each other, the need for interfunctional coordination and their lack of DP expertise.

Micro-DBMS as Catalyst

In short, it is in everyone's vested interest to support a coherent information management policy. Because of this, the use of a capable micro-DBMS can contribute enormously to achieving the goals of that policy. The micro-DBMS can easily be seen (and therefore used) as the catalyst within the corporation to "do it right" as far as distributed information processing is concerned.

Despite the relatively short life span of the personal and professional microcomputer, there is already a profusion of systems that are dedicated to managing data bases. While the systems addressed here do not comprise the entire list of data base facilities available, they are representative of the whole functional spectrum and demonstrate the caliber of systems running on the popular personal/business microcomputers used in many companies.

There are four basic levels within which all such systems fall:

1. *File Managers.* These systems can support relatively simple business applications using a single-file approach.

2. *Data Management and Reporting Systems.* More capable than Level 1 in their ability to enable powerful multifield searching, these systems nonetheless still have a one-file-per-application orientation.

3. *Interfile Data Base Managers.* These systems have impressive data base, data sharing capabilities and can support multiple business functions.

4. *Fully Functional DBMS and Application Generators.* These systems rival many mainframe-DBMS in their functionality; they can be easily interfaced to mainframe processing and data bases.

While the listed characteristics should enable a quick understanding of each micro-DBMS level, some of the individual systems have capabilities and limitations that might differ somewhat from those of their associated categories.

As made clear by the capabilities identified for categories 3 and 4, micro-DBMS are not starting out at ground zero. The data base concept has been getting more sophisticated throughout its 15-year history, and some of these systems reflect state-of-the-art data base functionality.

It is especially those systems in categories 3 and 4 that should be considered for utilization across a large enterprise. While systems in categories 1 and 2 might be suitable for stand-alone (local) business applications, they fall far too short in their data handling inflexibility

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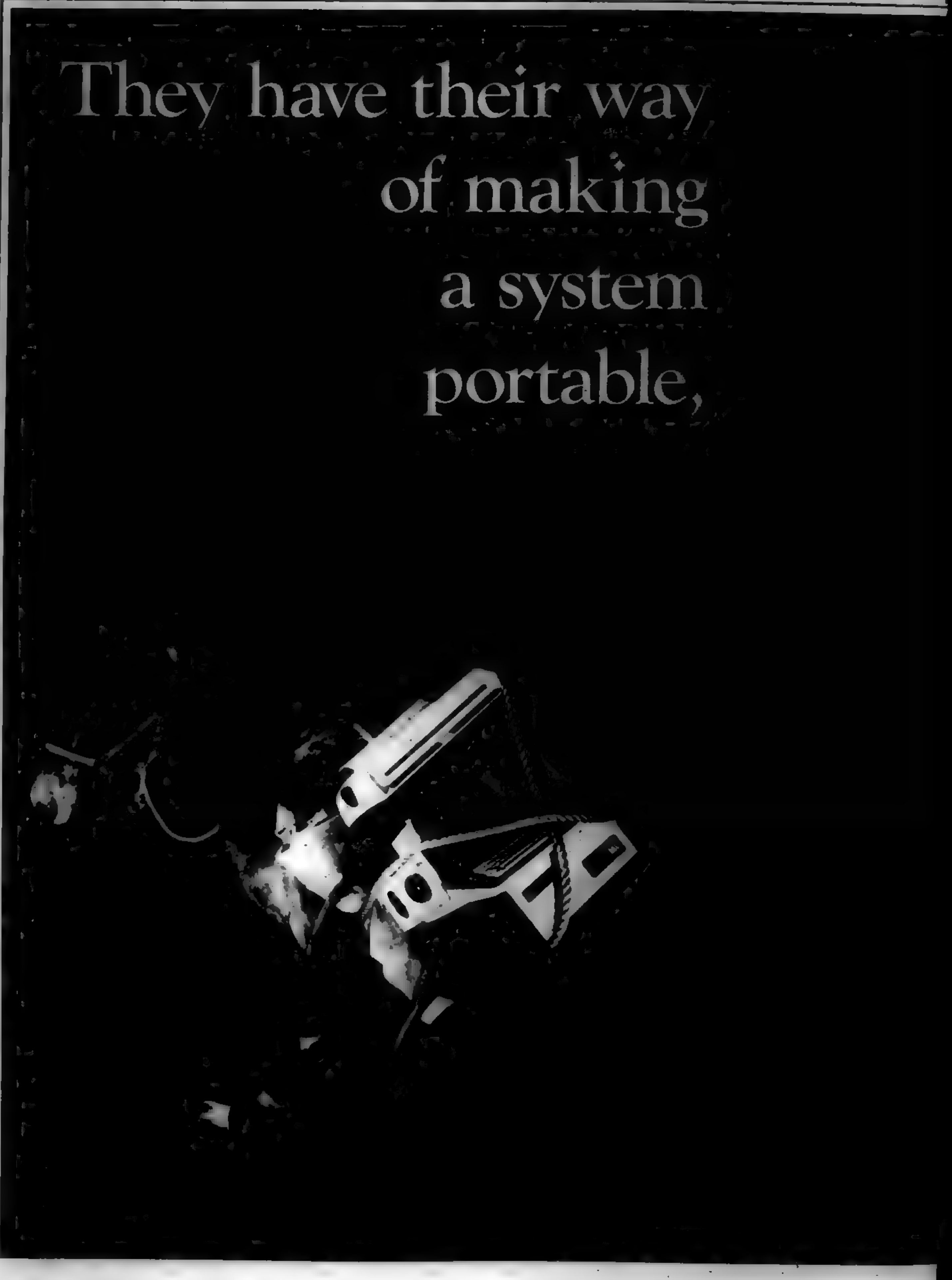

Prices to Drop, Revenues to Rise

Desktop Systems Offer Viable Business Solution

BOSTON — Desktop and personal computers are variations of one basic product — the microcomputer — according to The Yankee Group, a research firm based here.

Both personal computers and desktop computers are one-owner machines, but they are differentiated on the basis of their users (home, education, small business, scientific, industrial and office); applications (games, education, financial analysis and accounting functions); and technology (8-, 16- and 32-bit microprocessors, internal random-access memory [RAM] capacity and mass storage devices), not their marketing labels.

Microcomputers can be divided into two basic groups — personal and desktop computers — based solely on price. Personal computers are defined by The Yankee Group according to the following criteria:

- They generally cost less than $1,000. Most people simply cannot afford to purchase a personal computer that costs more than $1,000.
- They are consumer-oriented and are sold in console form. A personal computer's console contains both the CPU and the keyboard.
- Standard interfaces attach the console to a TV or monitor, audio cassette drive, floppy disk drive and other peripherals, but these are generally optional.
- Software is oriented toward entertainment, education or personal business.

Desktop computer systems, however, are, according to The Yankee Group, business-oriented personal computers. System prices range between $1,000 and $10,500, excluding printers.

In 1981, the average desktop computer system cost approximately $3,800 and contained an 8-bit microprocessor, 64K bytes of RAM, two floppy disk drives, a monochrome display and interfaces for attaching peripherals such as printers, hard disk drives, additional floppy disk drives, modems, printers and so on. Desktop computer systems can be programmed in a high-level computer language or can run off-the-shelf software primarily dedicated to business applications.

Prices Falling Steadily

Desktop computer prices are falling steadily at 16% annually. The Yankee Group expects the average system to fall from $3,800 in 1981 to $1,800 in 1986. Moreover, the 1986 average price will include a 16-bit (or, possibly, a 32-bit) microprocessor, 1M byte of RAM and read-only memory, dual high-density floppy disk drives, high-resolution color monitor, built-in modem, standard I/O interfaces and a keyboard.

North American desktop computer revenues are growing 40% annually, and The Yankee Group expects this market to grow from $2.31 billion in 1981 to a $12.59 billion industry by 1986. It also predicts domestic unit shipments to grow 63% annually from 609,000 in 1981 to 6,994,000 in 1986. The Yankee Group expects that after 1986, unit shipments will grow at only a 30% annual rate as prices stabilize and competition lessens.

Overseas shipments are expected to exceed the 30% post-1986 North American rate because many Japanese and European vendors are just beginning to step up production. These overseas vendors will also be more ag-

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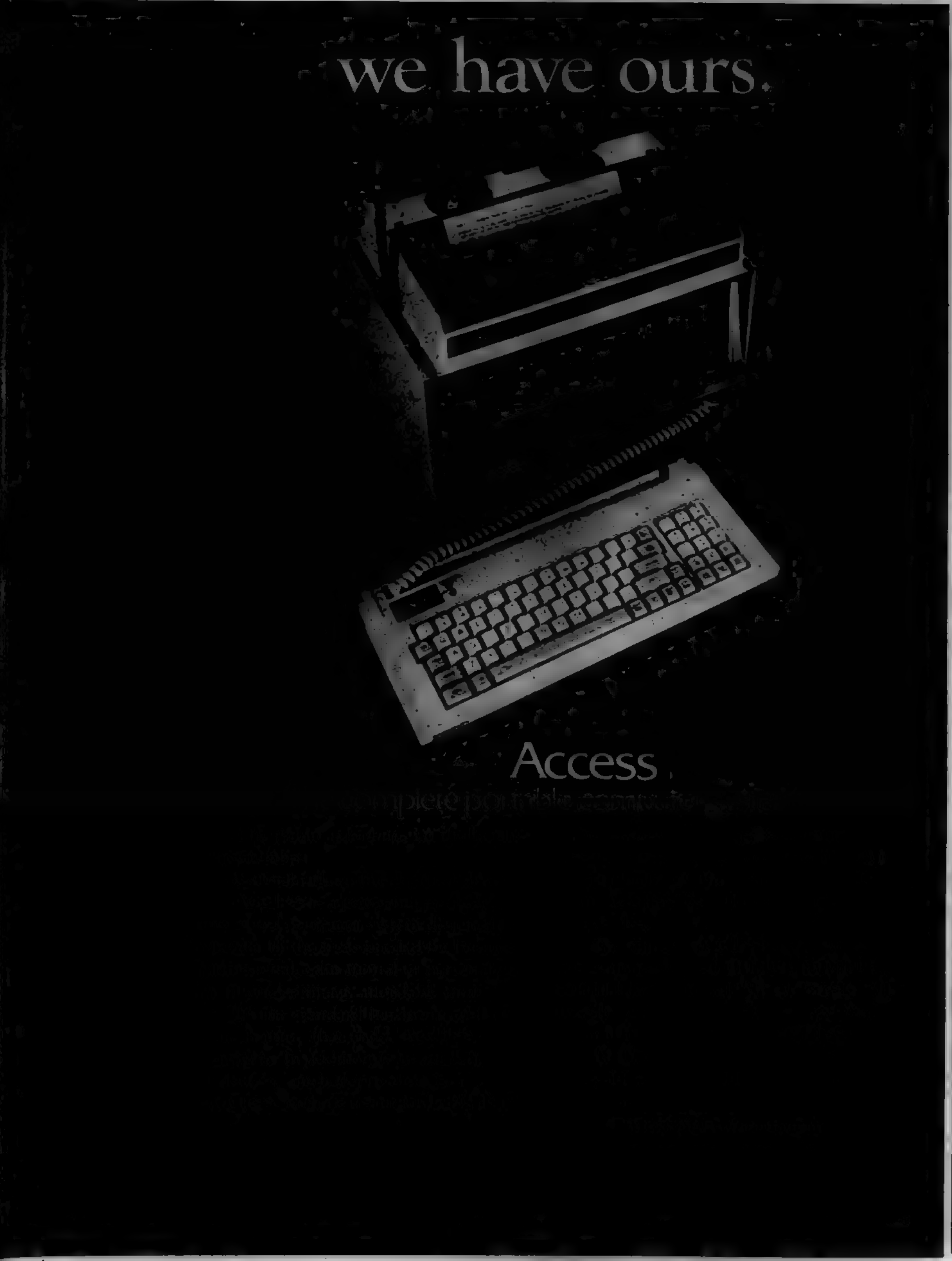


Prices for Desktop Systems Falling Steadily —

(Continued from SR/55)

gressive in exploiting markets in Africa, South America, Europe and Asia. North American vendors will, for the most part, forego these markets due to intense Japanese and foreign competition, unstable political climates and stringent import policies. In fact, Apple Computer, Inc. is already running into trouble in the oriental market where a flood of cheap copies that cost less than $500 are eroding its market.

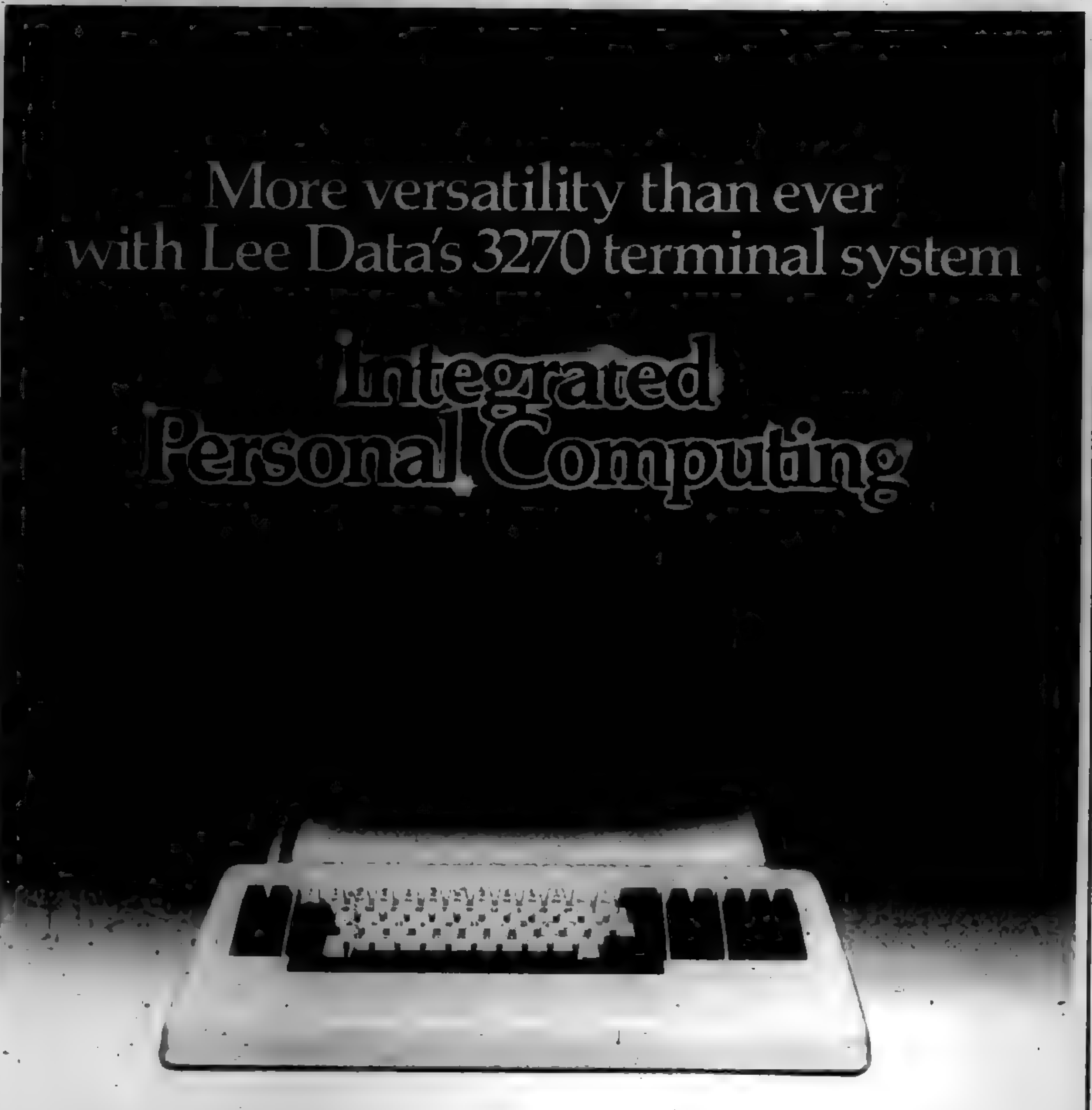
Overall, worldwide desktop computer shipments will grow dramatically from 1981 unit shipments of 836,000 to 1986 shipments of 10,694,000 for a 66% compound annual growth rate. During the same period, revenues will increase 44% annually.

The desktop computer market is a melange of cute names ("Apple," "Pet" and "Trash 80"), cutthroat competition, interwoven distribution systems and big money. Formerly disdained by large computer companies, the desktop computer industry began to attract the interest of the large computer firms when the sales of high-priced mainframes and minicomputers began to fall off.

Furthermore, when the economy slumped into a recalcitrant recession, personal and desktop computers continued to sell exceedingly well. Although margins were low, personal and desktop computer vendors overcame this limitation through large volume, retail sales and limited support.

All this finally attracted the interest of the "big boys." Apple welcomed IBM into the market with daring bravado by taking out full-page advertisements in *The Wall Street Journal* and *The New York Times*. Apple believed IBM's entry into the market would finally make the market legitimate in the eyes of the Fortune 500 companies. Since then, Digital Equipment Corp., Wang Laboratories, Inc., Burroughs Corp., NCR Corp. and other large DP companies have entered the fray.

Increased competition from IBM, DEC and others will stimulate, rather than wound, the market. As the desktop computer market moves away from its hobbyist origins, the effect on current and future vendors will be diverse. Apple's enthusiastic welcome will be short-lived, however, as it begins competing with IBM for re-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Administrate Micro Use

(Continued from SR/54)

for corporatewide usage.

One major mainframe-DBMS vendor is Cullinet Software, Inc. It purchased Computer Pictures Corp., a micro-based graphics company, and has thereby acquired both graphics and micro software expertise. Since Cullinet's experience with distributed data base processing extends beyond 10 years, one can assume that they will be announcing a micro-DBMS facility in the near future.

There is no current shortage of capable micro-DBMS, however, and the task at hand for many companies will be to select the appropriate one and use it in the proper manner.

Finneran is a principal consultant for the New York Data Base Group in White Plains, N.Y.

'It's OK, We Can Talk in Front of It.'

Sixteen Percent Drop Predicted Annually

tailers' limited shelf space, access to scarce programmers and IBM-devoted corporate accounts. With the Apple II now four years old and the Apple III just starting to catch on, a great deal of Apple's success will rest on its daring distribution strategy (for example, dropping agreements with Computerland and the Xerox Store) and the recently announced Lisa and Apple III.

Tandy Corp.'s strong retail network and diversified product line may be least affected by the big computer companies. With its own distribution network (Radio Shack), Tandy's only major problems are reputation (it still suffers, unjustly, from the "Trash 80" nickname) and the weakness of its premiere product, the Model 16, which still lacks a multiuser operating system that would capitalize on the power of its Motorola, Inc. 68000 microprocessor.

In terms of price, Commodore Business Machines, Inc. is the leader among the major desktop computer vendors. With its recently introduced Model 64, the BX256 and B128, Commodore has forced personal and desktop computer prices to a new low.

Commodore's major problems are its lack of software and its distribution network. All the new Commodore products will offer optional Digital Research, Inc. CP/M cards, and this circumvents Commodore's software problems to some extent. Although this gives Commodore users access to thousands of programs, Commodore only supports approximately 50 applications. In the desktop computer marketplace, software quality and support are critical to a vendor's success.

Who Will Succeed in the Battle For Desktop Market Share?

Today's desktop computer market is a loose conglomeration of large and small companies competing for a diverse customer base in diverse ways. Over 150 companies are battling for market share. Aside from fighting for customers, desktop vendors must also compete for distribution channels, shelf space, service facilities, software suppliers and personnel (programmers, engineers, sales and support).

Entries from IBM, Digital Equipment Corp., Wang Laboratories, Inc. and Xerox Corp. have legitimized and intensified the desktop computer market.

Three vendors — Apple Computer, Inc., Tandy Corp. and Commodore Business Machines, Inc. — controlled 54.9% of the market as of year-end 1981 and are considered the first-tier companies. Formerly, they set the standards and led the market. Their visibility in numerous retail stores, along with their large software libraries and established user base, provided these companies with momentum.

The 1982 market shares, however, are substantially different and reflect IBM's full entry into the desktop computer market.

The first-tier companies' large installed base, however, is less of an asset than it appears to be. Desktop computer users can be extremely fickle. Like automobile aficionados, they will readily trade their old model for a hot new machine. Witness IBM's success with its personal computer, the IBM Personal Computer. In only four months (August 26, 1981 to Dec. 31, 1981), IBM sold 20,000 personal computers. This year The Yankee Group expects IBM to ship 175,000 personal computers.

Who will fail? This seems to be the big question with IBM's, DEC's, Wang's and, to a lesser extent, Xerox's entries into the market. Every new vendor must quickly answer this challenge to stand a chance of surviving. At the critical retail level, limited shelf space, inventory constraints and sales training factors are likely to shove some vendors' products out of the bigger retail chains. Other factors peculiar to the individual vendors will also affect who will fail.

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Provide Direct Link to Systems

Insurance Agents Take Micros 'On the Road'

DENVER — Security Life was 55 years old in February 1983 and has grown from a small operation with $500,000 in assets to $302 million in 1981.

To keep up with its impressive growth without a corresponding increase in personnel, the company relies heavily on the use of computers and advanced insurance software. The demand on these systems, however, has created an applications backlog estimated to be in excess of 20 man-years.

One of the company's most significant backlogs was remote on-line service to its agents. Therefore, during the early part of 1982, a working group was formed and charged with establishing a long-range plan for communicating with the agents.

At that time, service to the agents consisted of a stand-alone insurance proposal system based on a Perkin-Elmer Corp. 3230 minicomputer and a policy inquiry system under development that would run under CICS on a National Advanced Systems, Inc. AS/5-3. Both systems used the PE 1251 terminal, and there were a limited number of agents on-line.

Since all agents are independent businessmen and not subsidized through the home office, they were required to purchase their own equipment. The terminal, printer, modem and other parts cost about $45,000. So there was a considerable amount of pressure for Security Life to support one of the microcomputers.

The agents felt that a micro would give them the flexibility of direct communications with the company's proposal and policy inquiry systems and still allow them to do other applications directly associated with their private business.

The corporate group established the following criteria for evaluating micros:

- It would support the agent's micro only in communications with the proposal and inquiry systems.
- The micro could be made to communicate to the asynchronous proposal system and to the bisynchronous inquiry system.
- The company could give the best support by limiting itself to only one brand of microcomputer (at least initially). Therefore, it was important that the micro have a large dealer-support network and a wide variety of software that would meet the varied personal needs of any agent's specific environment.

With these restrictions, only the products from Apple Computer, Inc., Commodore Business Machines, Inc., IBM and Tandy Corp. were evaluated. In the final decision, Apple was chosen because of its national accounts support program and the vast amount of professional software available.

National Agreement

In August 1982, Security Life signed a national accounts agreement with Apple that allowed the agents to purchase equipment directly through the company and take advantage of a volume discount. In this short six-month period, it brought seven Apple users on-line, in addition to the original 38 users with the dedicated PE terminals.

Security Life uses Tymnet, Inc. for a remote network and it provides the facility to direct an incoming message to the PE machines for the proposal system or to the 3705 for the inquiry system. It also provides 3270 emulation for the terminals. A Datastream T7 is used for 3270 emulation for the Apple computers.

The need for more sophisticated proposals prompted the company to purchase a second proposal system that runs on its IBM 4341-2 mainframe. In addition, the firm is now rewriting the PE-based proposal system to run on the 4341-2 and to increase its functionality. This rewrite will incorporate full screen (3270-type) editing in an asynchronous environment. When the upgrade is completed, the PE system will be removed.

In addition to the Apples in its network, the firm currently has 15 Apple III systems within the home office. These machines have been significant in relieving pressure from the firm's saturated central word processing department. However, they are also used to perform many tasks that would never have been able to be put onto the company's mainframe computers, given its applications backlog, according to the assistant vice-president of systems, David Hatch.

"As an example, much of the systems department project control sys-

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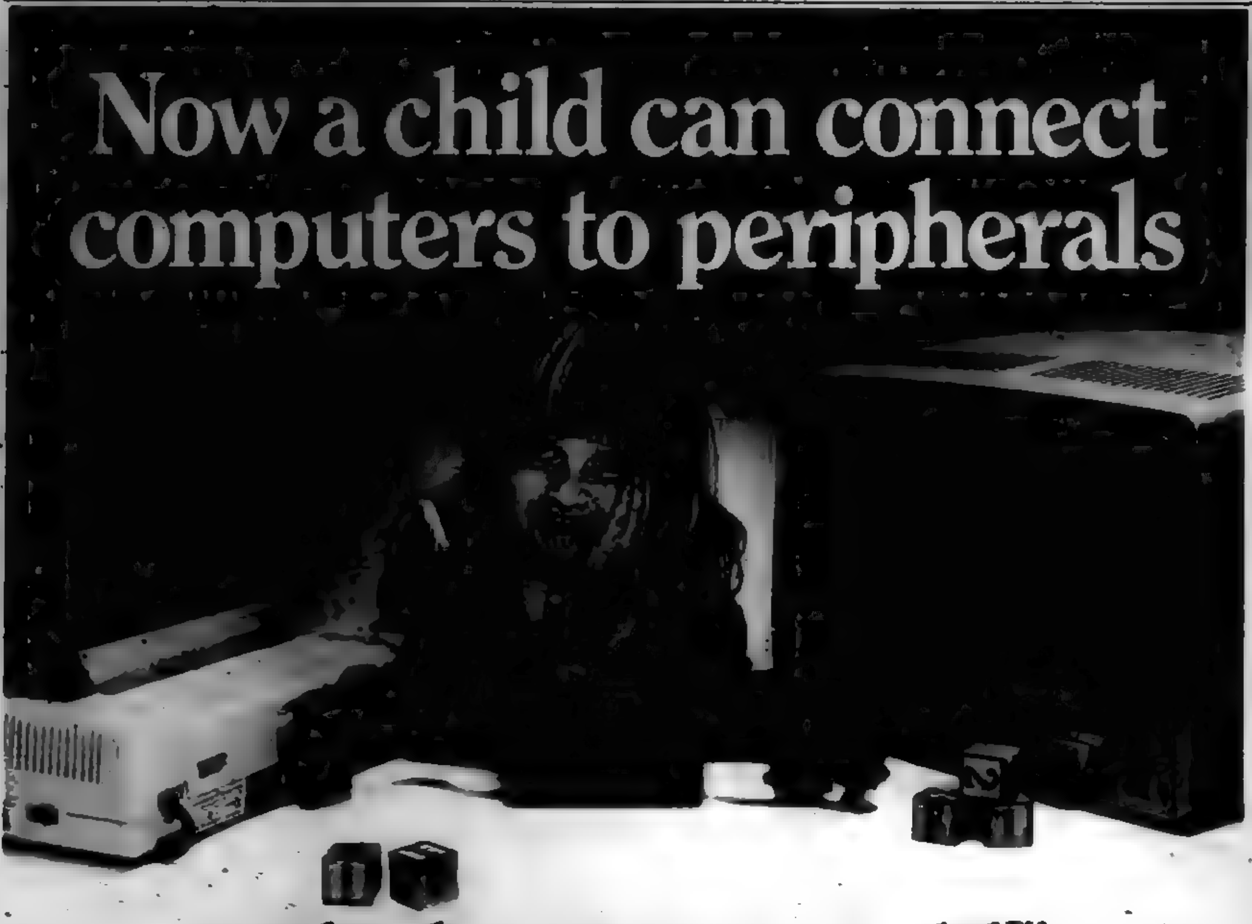

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Started With Random Use

Formal Micro System Ties Sales Offices to Net

PLAINVILLE, Conn. — About two years ago, a number of sales offices in General Electric Co.'s Contractor Equipment Business Operations Division here started using personal computers to perform sales analyses and to develop related applications. This happened because people in the sales offices needed access to the firm's information services network and needed to develop a number of specialized applications for their own use.

This random use of personal computers soon led to a formalized system, designed in 1982, using IBM Personal Computers with 128K bytes of random-access memory; expansion cards for additional serial and parallel ports, a battery clock, a 15M-byte disk and an autodial Racal-Vadic, Inc. modem. The system uses Cobol 80 running under IBM DOS as its primary language to facilitate maintenance and transportability.

The system also allows users to enter and validate data and generate local reports on the Personal Computer without access to the General Electric Information Services Co. (Geisco) host, according to GE Contractor Equipment Business Operations Division managers Harry I. David, Dale R. Clement and Jack L. O'Bryan.

Key Requirement

A key requirement of this approach was the availability of fast, reliable and easy-to-use communications between the Personal Computers in the sales offices and the plants, David said. Various communications packages provided some of these characteristics, but none provided them to the extent GE felt was essential for successful implementation of the system. The Personal Computer's asynchronous communications had to be enhanced to provide the integrity, error detection and recovery necessary for the application, David said.

The solution was to develop an asynchronous communications package for the IBM Personal Computer using Basic.

This communications package interfaces with Geisco's Mark III Service to link a network of IBM Personal Computers and reportedly provides:

- Unattended operation and ease of use.
- Enhanced data integrity.
- High transmission efficiency.
- Security features, including encryption and decryption of sensitive data.
- Remote Personal Computer maintenance.
- Electronic message delivery.

The package described would require significant modification to operate with other personal computers or to utilize anything other than a Geisco host, David said. All communications would be initiated by the Personal Computer. This package is proprietary to GE and is not currently available commercially.

The salesman uses the IBM Personal Computer during the day to prepare propositions that are printed locally and immediately. This process creates several files that must then be transmitted to a plant or headquarters location, according to David.

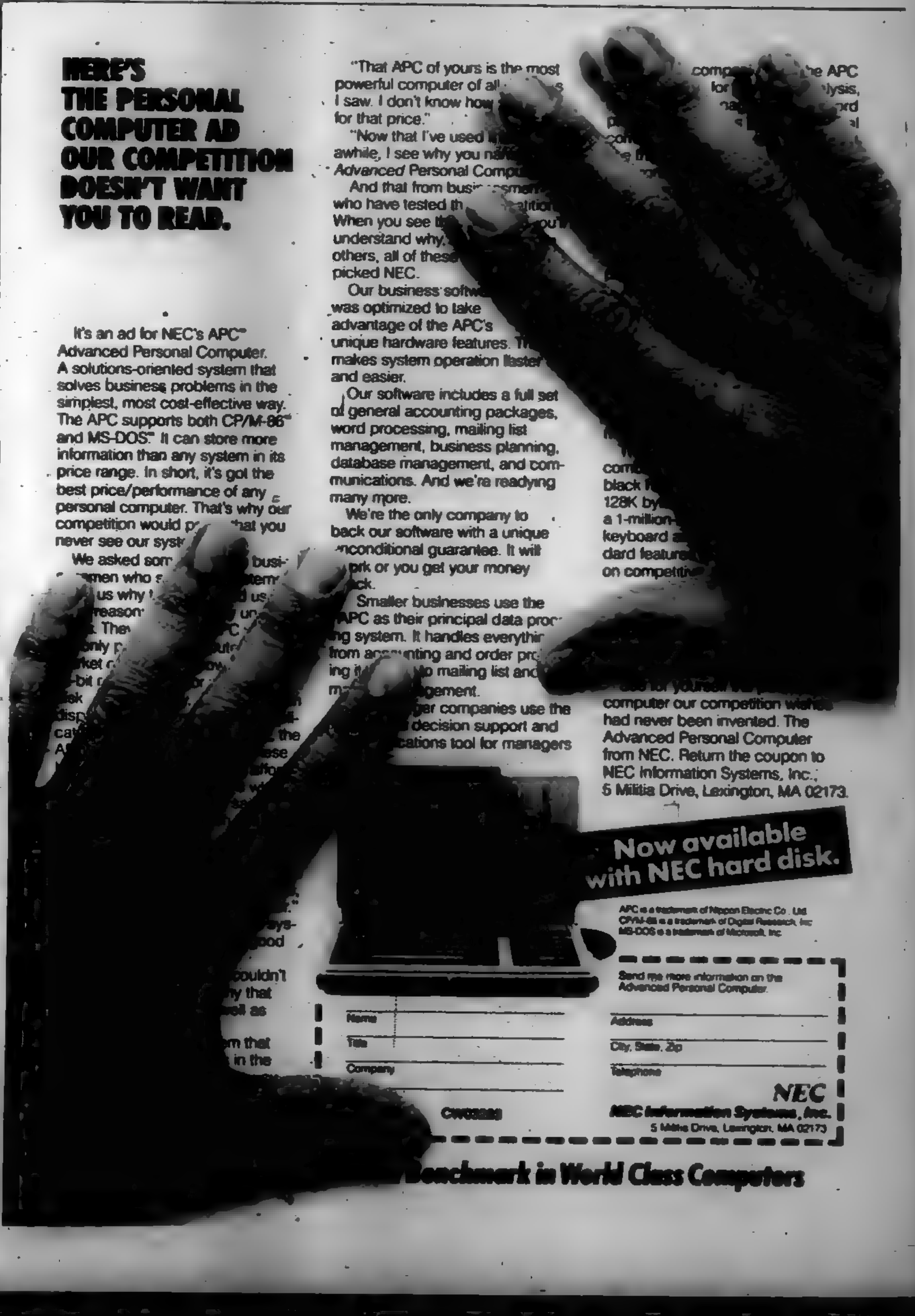
Immediate or "express" transmission is sometimes necessary, and it is possible. Deferred transmission is preferred, however, to take advantage of off-peak discounted I/O and phone costs.

Since no one is in the office at such hours, unattended operation became essential, David said.

Both express and deferred transmission had to be extremely easy to use by clerical and sales personnel, with no local assistance when problems were experienced. This was accomplished by leaving the Personal Computer on after hours and using a program in the Personal Computer to check the battery clock for the predetermined sign-off time. A status screen warns of any meddling fingers and marks a "count down" to transmission time with other information. At the appointed hour, the Personal Computer initiates the communication session with the host using a Racal-Vadic autodial modem. All interactive responses — line rate, parity, phone numbers, user numbers, passwords and so on — are replaced by using file input, according to David.

The program initiates the dialing sequence; it will try the dialing sequence several times on the least expensive primary routing before trying two other alternative numbers. Once a line is seized — carrier detected — the Personal Computer

(Continued on SR/62)



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Seminars Reveal Myriad of Problems

Is Micro Migration Causing Data Base Mayhem?

By Guy Cimo
Special to CW‡

Users of large mainframes are observing departments within their company migrating to microcomputers to satisfy increasing demands for a variety of new data and word processing applications.

These marvelous cost-effective systems perform a multitude of tasks upon demand by personnel who do not have computer expertise. A marketing executive can look at a forecast and predict the effects of a price decrease.

A finance manager can easily sort out the deadbeats from the good payers when looking at an accounts receivable aging report. A bank executive can do gap, asset/liability and rate sensitivity analysis.

There is no doubt that these and thousands of other people have discovered these ready alternatives to the DP manager's traditional "Cecil B. De Mille production" — cast of thousands, millions of dollars and years in the making. Many just go to the computer store and buy a solution.

Or do they? A series of work sessions and seminars with data processing and management information systems (MIS) personnel were conducted. They revealed a myriad of problems, and several facts were discovered.

Data Base Mayhem

It is obvious that when DP departments do not provide the products and services available with microcomputers, user departments and customers go elsewhere to satisfy their needs.

Of course, the first problem customers encounter is insufficient storage capacity, which is followed by the fact that all the information they need to do the job is on mainframe files.

After that, they realize that their data base does not resemble any other data base. In fact, it does not even look like it did last week. Imagine each department establishing its own data base, learning and implementing data management, control, security, integrity, standards and all of the disciplines that took decades to develop and are in place in the DP department.

Somewhere along the way, a lot of people confused distributed processing with microcomputers infiltrating every corner of the building. When the financial manager bought his microcomputer from the computer store to write some letters on his word processor and project costs using "what if" analysis, the DP manager thought the problem went away.

The manager was wrong. The problem had just begun. After all, everyone knows that bean counters do not know how to specify what data they need from the DP department, how to maintain the microcomputer or where to buy printer ribbons.

Someone has to straighten out the mess, and it most likely will not be the finance manager. After all, he merely wants an application — he does not want a new profession. He went to the computer store because the DP department could not deliver the goods.

'Many were developing mainframe applications that emulate microcomputer programs. Using a mainframe to execute microcomputer programs is like using an 18-wheel tractor trailer.'

In the seminars, the DP managers were asked three revealing questions. First, how many people work for a company in which microcomputers have been installed? Almost invariably, all hands went up. Second, how many people work for a company in which the DP department was either responsible for or in some way involved with the selection or management of the microcomputers? Very few managers answered yes to that question. Third, how many DP departments does the company have?

These three questions led to discussions on the DP and MIS directors' responsibilities related to the proliferation of microcomputers in their facilities.

In most cases, the managers felt responsible, but tended to avoid responsibility because they really did not have the answers for those user departments coming to them with their needs.

After getting a handle on the problem, it was necessary to find out

(Continued on SR/64)

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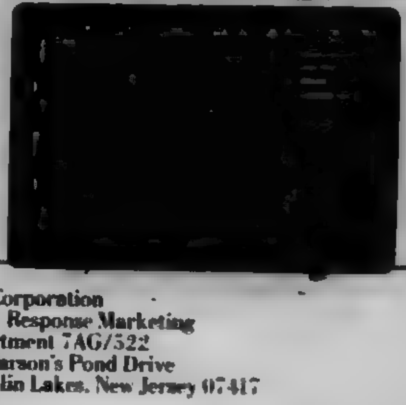

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Micro System Links Sales Offices to Network

(Continued from SR/59)

signs on with a predetermined user number and password and executes a host communications program, according to David.

This communications program simulates a synchronous line interface using control turnaround flags for synchronization. The dialogue begins with a "positive handshake" acknowledgment from the host. This dialogue provides bidirectional data flow control, error detection and correction under program control, David said. A printed log on the Personal Computer's printer prints a running commentary on the night's traffic to aid the user in knowing positively what transpired and to assist with diagnosing aberrant conditions.

GE enhanced data integrity by adding a "bit sum" header character to each record and to each 4,000-char. block of records, according to David. The bit sum is calculated before transmission, and the receiving program collects the entire block in a buffer and recalculates the bit sum characters and matches them against the bit sum transmitted. The buffer is written to disk only if the bit sum for each record and for the entire block are equal. This precludes a matched bit sum for the block resulting from a combination of record errors. When this disk write is completed, an acknowledgment signal is transmitted indicating that it is ready to receive the next block or command. If an error is detected, a nonacknowledgment is sent requesting retransmission of the previous block.

The security features, controlled by the host, can transfer control to a master personal computer for changing passwords, phone numbers or encryption keys. According to David, the security system was designed to deactivate the application programs of the remote Personal Computers if certain abnormal conditions are encountered. This is reversible only by the host control.

This issue was addressed by designating one or more centrally located Personal Computers to assume the role of master, David said. The master Personal Computer contains the master data base and applications programs. Data base maintenance programs on the master Personal Computer creates a log of all record changes for transmission to the host, where it is assigned a release number and stored for later release to the remote "slave" Personal Computers when they dial in for routine daily transmissions.

No distributed processing system is complete without some form of an electronic message system. In this application, messages can be transmitted from a Personal Computer resident file or keyboard to the host files from which it is transmitted directly to the printer, not the disk file, of the intended receiving Personal Computer. The remote office can use this facility either in deferred overnight mode or for immediate express communications.

The package also permits file transmissions from Personal Computer to Personal Computer via the Geisco host. The receiving Personal Computer obtains the transmitted files when it signs on for the next communications session.

The system described is scheduled to go on-line in the U.S. by March 31. A related application, IBM Personal Computer to IBM System/38 communications using SNA/SDLC is now being investigated.

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Have Micros, Will Travel

(Continued from SR/58)

tem is being shifted from the mainframe to an Apple III, and we are currently evaluating project management systems to further off-load the mainframe and provide additional flexibility," he noted.

What does the future hold for microcomputers at Security Life?

"We will be watching with great interest the progress of Apple's new Lisa system, since we may adopt it as the basis for our future office automation system," he said.

"More specifically, however, plans are currently being formulated to allow the Apples as well as our ever-growing number of local 3270 terminals — 150 to date — to interact with each other in our Rolm [Corp.] CBX-based local network for applications such as electronic mail. Our current Rolm system will be upgraded to handle data transmission during 1983 and the electronic mail system is estimated to be in place early in 1984," he said.

Security Life also anticipates being able to allow programmers access to VM/CMS from their Apples. This should allow these people on call to solve some middle-of-the-night production problems from their homes instead of driving to the office.

For Project Cost Estimates

Architectural Firm Designs Its Own Micro Net

SAN ANTONIO, Texas — An architectural firm here has done more than design buildings for other people. The firm recently designed its own microcomputer network.

The architectural firm of Rehler, Vaughn, Beaty and Koone, Inc. (RVBK) employs 42 people and provides architectural, landscape architectural and interior-design services. According to Arthur P. Mazuca, associate vice-president for DP, RVBK is considered large by comparison to other architectural firms, which consist of about six to 10 people.

RVBK recently installed a data processing system that consists of a 10-station Televideo, Inc. network. Using Digital Research, Inc.'s CP/M operating system, the system uses a Televideo TS816 microcomputer that is equipped with an 18M-byte hard disk drive.

The TS816 can support up to 16 stations and is responsible for handling mass storage. The unit also drives two of the three printers at the firm, Mazuca said.

Main User Station

The main user station is a Televideo TS802 microcomputer. Based on the Zilog, Inc. Z80A microprocessor, each unit has its own printer (a Texas Instruments, Inc. TI820) and two floppy disk drives offering 340K bytes of memory each. About nine of the user stations, however, are Televideo TS800A microcomputers. The units are also based on the Z80A microprocessor, but do not come with disk drives or local printers, Mazuca explained.

The kind of work done on the RVBK system can be divided into three applications: word processing, accounting and architectural applications, according to Mazuca.

Word processing applications make up the largest volume. A standard word processing package, Micropro International Corp.'s Wordstar, is used to process various types of documents such as letters, proposals, contracts and construction specifications.

The word processing package is used regularly by about six people, Mazuca said.

The accounting application consists of the usual packages like general ledger and payroll. However, a special program was developed inhouse to perform project cost accounting.

Mazuca said this program is used to keep track of budgeted and actual expenditures on all of RVBK's active projects. The package then is used to print monthly invoices.

With the information provided by the special project cost accounting package, RVBK can make real-time decisions based on factual data about the cost of a project.

In addition, the information collected by the package helps the firm to develop more accurately budgets for similar projects, according to Mazuca.

Special architectural programs, however, are the key to the firm's operation, Mazuca said. Also developed in-house, these packages include a preliminary project cost-estimate package for architects and contractors.

This program was developed to produce preliminary project cost estimates in the early stages of a project. It can be used as both a design and marketing tool, Mazuca said.

The program also can be used as an early way of analyzing a site. For example, the package can be used to analyze building size and parking relationships.

With this tool, Mazuca said, designers can vary quantitative and qualitative factors to develop the most efficient project within the clients' guidelines.

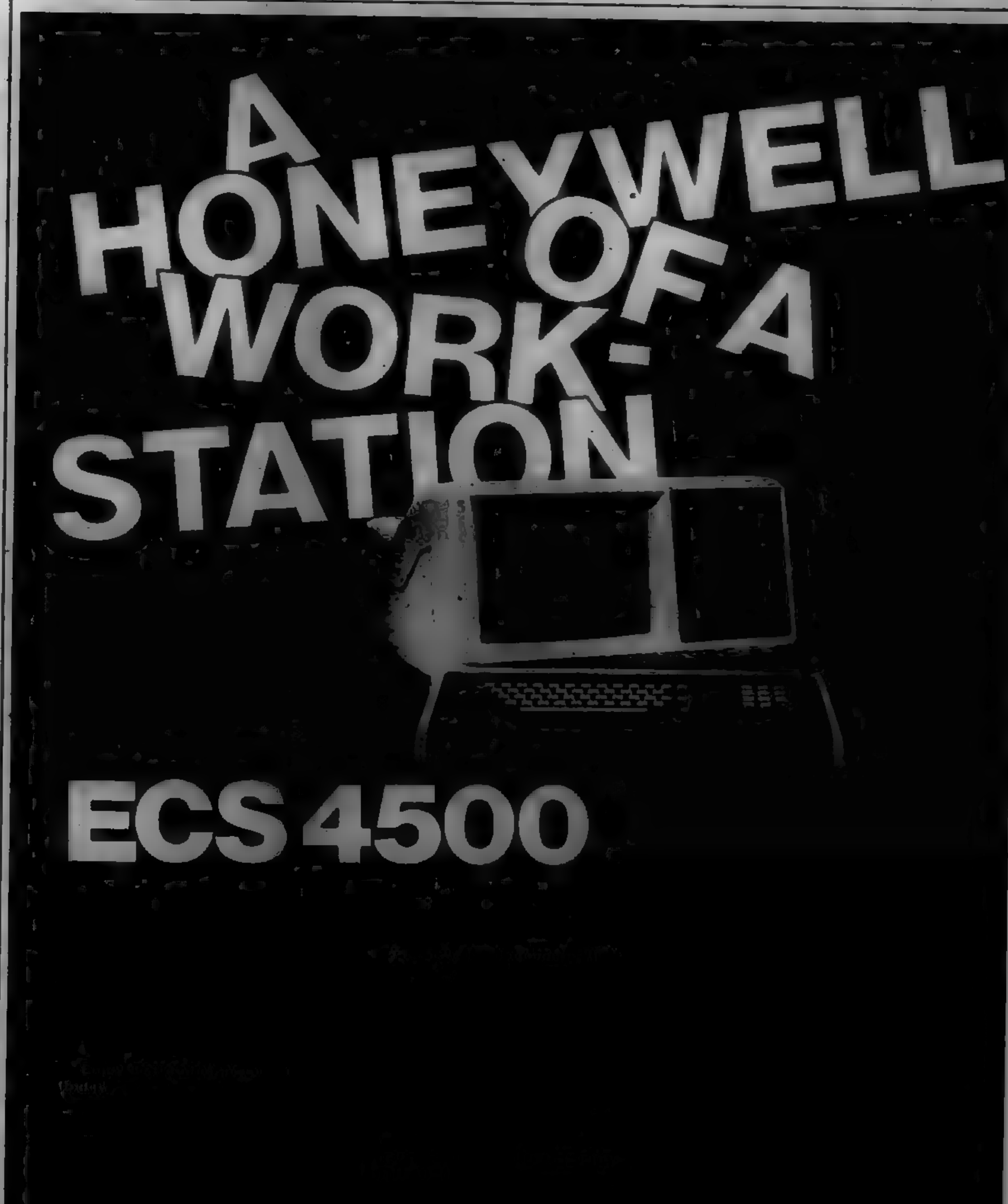
Analysis Program

Another major architectural program, Mazuca said, is the income property analysis program. This program is a tool for evaluating and structuring rental projects.

The package can consider everything up to the tax profits for the first year of operation at full occupancy. Furthermore, the package can focus on the development and construction phases of the project.

Mazuca added that the package can calculate and display income items and operating expenses in various stages of detail. In addition, the package can automatically calculate initial operating deficits and is able to work with phased projects, Mazuca said.

Mazuca added that there are several other smaller specialized architectural programs that address specific needs of the firm.



Micro Migration Can Cause Data Base Mayhem

(Continued from SR/61)

how others were dealing with it. There are many wrong ways to do the job.

Software houses seemed confused and were headed in the wrong direction. Many were developing mainframe applications that emulate microcomputer programs. Using a mainframe to execute microcomputer programs is like using an 18-wheel tractor trailer to go to the store for a loaf of bread.

This approach is in total opposition to distributed processing. Instead of off-loading such jobs from the mainframe, they are brought to the mainframe. This path is not chosen — it exists because software developers and suppliers have little choice.

Microcomputer users, on the other hand, believe they are taking care of the problem by emulating CRTs and putting them on-line to the mainframe. Of all the tasks that microcomputers can do, emulating a CRT is one of the easiest.

Communication Problem

Now that the mainframe and microcomputer users are able to talk to each other, what on earth do they say?

This situation is like connecting two telephones with a wire and trying to get a Russian to communicate with an American. The microcomputer users think they have finished the job, but they have not even begun.

The end user wants to execute microcomputer applications on data that resides on the mainframe. He does not want to be a DP manager or field service technician.

The DP manager wants distributed processing, so the end user can do his own job, and centralized control, so the end user cannot create problems.

The president wants management by design — not default.

Solving the Problem

This problem must be addressed. The following steps were taken to solve this problem:

- The end user received a microcomputer on which to run his 1,493 applications. He was given a system whereby he could define, select, extract, sort and transfer data from existing mainframe files to the microcomputer in a format that would allow him to process that data with the 1,493 microcomputer applications.

Additionally, the system is bidirectional so the user can develop a transaction or data entry file, transfer it to the mainframe for output to disk, tape, system printer or for updating master files.

- Next, the DP manager was given control of the system. All data passed between computers is controlled by an elaborate security system. Users are assigned levels of security for function, file, record and field access. The DP is the only person who can execute programs that modify master files.

Additionally, the manager was given the ability to deliver the products and services for which the user had been clamoring, while actually decreasing work load, including that of the mainframe.

- The president received the management he wanted. Now the entire spectrum of information processing may be managed by professionals with decades of experience and know-how.

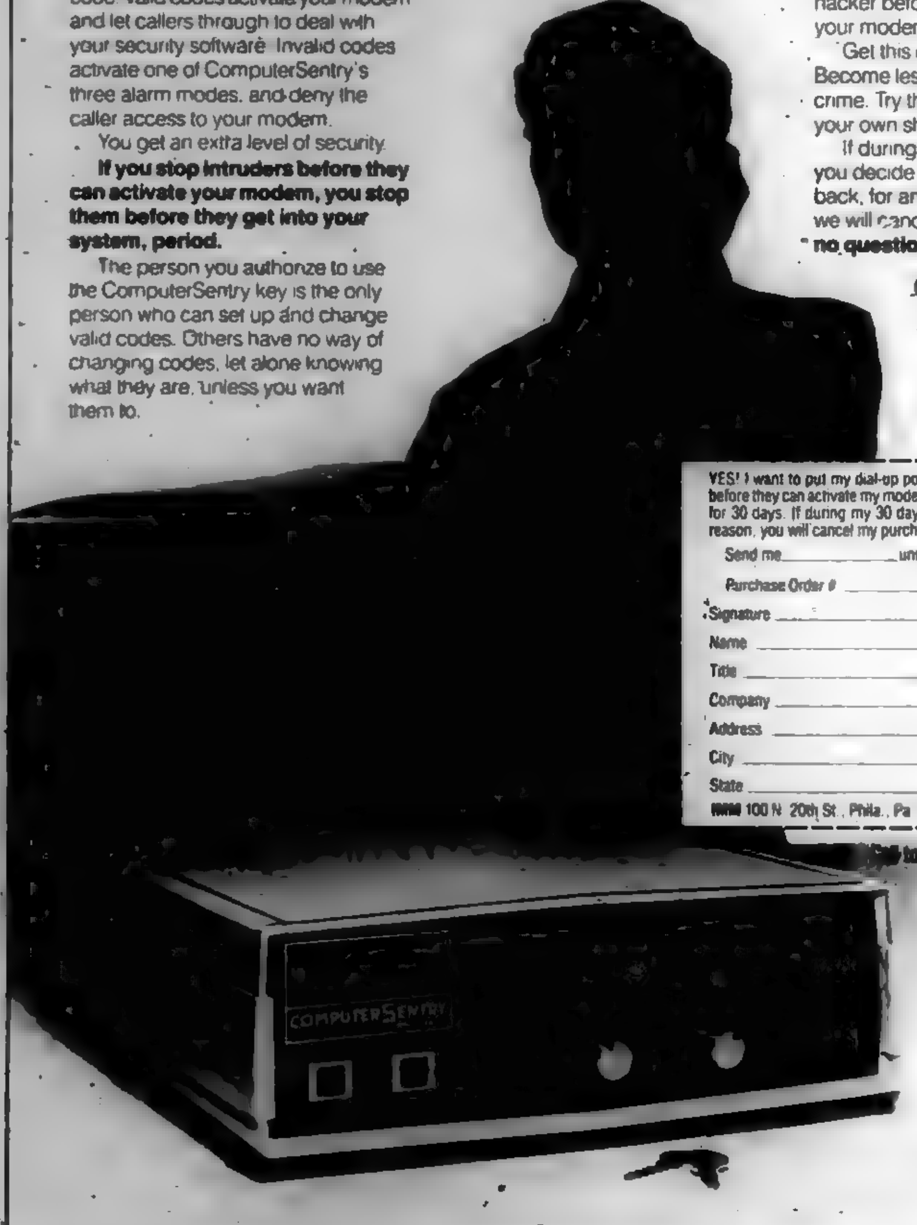
This system is comprised of a powerful and easy-to-use teleprocessing monitor; an elaborate, highly versatile on-line inquiry and report system; and a unique multiprotocol communications driver.

It also includes numerous assembly language programs and intimate knowledge of operating systems, applications programs and hardware design.

Most of all, the process took an understanding of the total distributed processing system from the top down.

Cimo is the founder of Computer Enhancement Corp. located in Costa Mesa, Calif.

George, Dear, You Know How You Hate Doing Our Tax Returns. . .?



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User Access to Info Improving

Financial Aids Seen Entering New Era

By Paul Gillin
CW Staff

NEW YORK — Financial software packages are entering a new stage of development that will see less emphasis on new features but dramatic improvements in the availability of diverse information to end users.

That was the opinion put forth by Jane Kitson, product manager of commercial application software at University Computing Co. (UCC), in a session entitled "Financial Software — A Management Partner" at Software Expo East here last week.

"The emphasis is no longer on the machine, it's on how the machines can get us the information we need," Kitson said. "Every major financial software vendor is now incorporating other packages into their financial software." Popular new additions include graphics, decision support systems and microcomputer links. "The burden, up until the last six months, has been on the buyers integrating these packages themselves," she noted.

As examples, Kitson cited Cullinet Software, Inc.'s recent acqusition of Computer Pictures Corp., a specialist in analytical and graphics software, and UCC's addition of Context Management Systems, Inc.'s Context MBA package to its product line.

A typical financial package of two to three years hence will allow the user to download accounts receivable, accounts payable and shop control data at the same time and manipulate them "so you can see what your cash position is really like."

Kitson noted that financial software has completed two distinct stages of development. The first, she said, was organizational control, in which the software was used primarily to ensure that plans and tasks were carried out. In the second stage, which she called management control, managers used financial software to plan budgets and personnel practices and to measure performance.

Now financial packages are moving into the realm of strategic planning, Kitson asserted, in which the software in

(Continued on Page 68)

'JCLFlow' Documentation System By Consumer Systems Fits DOS

OAK BROOK, Ill. — Consumer Systems, Inc. has announced its JCLFlow application documentation system for IBM DOS installations.

At the same time, the company announced a new PL/I version of its Databasic utility system for OS installations and enhanced its Test/IMS software package.

JCLFlow automatically provides graphics system flowcharts and reports and has information management capabilities, a spokesman said. It provides a current picture of applications software, flexible reporting criteria, operations run information, system trouble shooting aids and source program scans. The package accepts DOS and Power JCL as input and uses the installation's standard labels and assignments. A permanent license costs $7,500.

Databasic is a utility package for creating, testing and maintaining IBM DL/1 data bases. The new version includes a module that is said to reduce CPU cycles used to move segments within the system, a checkpoint/restart capability, a parameter card generator, a compare/flatbase function that reports on changes to the data base and options that allow limiting of the subset data base size. A permanent license costs $23,500 for OS, $13,500 for DOS.

Enhancements to Test/IMS provide more efficient use of load library storage space, hard-copy support from any terminal and maintenance enhancements, the vendor said.

Features include full-screen support without TSO, replacement of standard dump with minidump and elimination of TSO for testing. A permanent license costs $16,000. More information is available through P.O. Box 3637, Oak Brook, Ill. 60521.

CAP Development Methodology Incorporates Reusable Code

By Lois Paul
CW Staff

NEW YORK — Netron, Inc., a Toronto-based software firm, introduced a software development methodology that incorporates reusable code at the recent Software Expo East conference here.

Like computer-aided design and manufacturing, Netron's Computer Aided Programming (CAP) methodology is said to provide a software development environment in which the computer handles the bulk of the work required to build and to maintain code. This custom code is spliced with reusable code to create application programs. The methodology's approach also is geared to permit creation of software development tools that will aid the development of business applications.

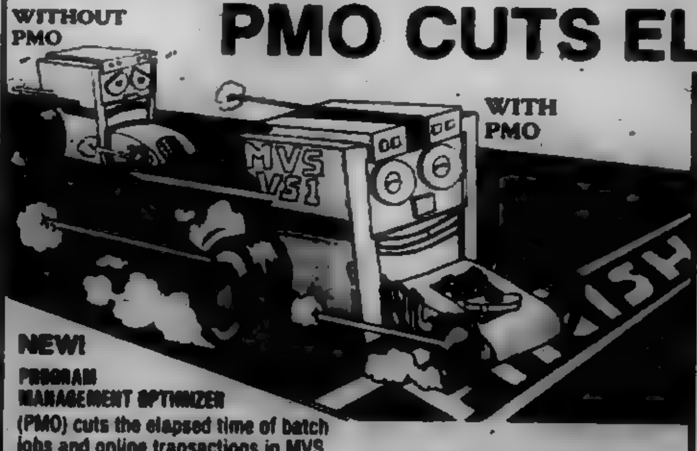
Paul G. Bassett, vice-president of software manufacturing for Netron, explained that the heart of the CAP system is a technology employing reusable software components called Frames. "A Frame may be thought of as a framework or architectural blueprint from which a particular kind of application can derive," he said.

Upward Compatibility

The upward compatibility of Frames eliminates the problem faced when changes to subroutines compromise programs written using an earlier version, Bassett said.

CAP retains the architectural structure and specifications defining each program, storing what is unique to a given program in one location for maintenance purposes. Bassett said the system was designed to build a program from specific, goal-oriented instructions supplied by the user. A Components Assembly Program then blends together standard frames and computer-generated and custom code into an application program written in a base language such as Cobol. These programs can be compiled and linked into computer-

(Continued on Page 75)



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DOS, OS Users Offered Line of Distributed Systems

RACINE, Wis. — Information Management Software Specialists, Inc. (IMSS) has announced a line of distribution systems for IBM DOS or OS users with command level CICS.

Called the Distribution System, the package includes a package and three separate modules that tailor the system for large-scale distribution. Customer Order Management includes modules and an interface to IMSS' accounts receivable package. The Customer Order Management package costs $58,900.

Additional modules include Pricing/Promotion, priced at $10,000; Pooling, priced at $15,000; and Bill of Lading Transmission, priced at $7,000.

The entire Distribution System costs $90,900 from Box 1633, Racine, Wis. 53401.

Comprised of Five Packages

XP System Fits DOS/VSE, OS

COLUMBUS, Ohio — A line of utility packages for IBM DOS/VSE and OS systems has been introduced by Goal Systems International

The Extended Productivity (XP) System comprises five packages for DOS/VSE: Faqs/XP, operational control; Flee/XP, library management; Faver/XP, Vsam data base integrity; JCLMan/XP, VSE job control and scheduling and Explore/XP, performance monitoring.

The OS XP System includes Faver/XP and PDSMan/XP for partitioned data set management.

Bundled, the DOS/VSE package starts at $451.50/mo on a renewable license or can be purchased for as low as $424.50 on a permanent license. For OS, bundled renewable licenses start at $262.50/mo or $246.75 purchase price. The firm is located at 5455 N. High St., Columbus, Ohio 43214.

Informatics Enhances 'Mark V'

WOODLAND HILLS, Calif. — Informatics General Corp. has introduced Release 4 of Mark V, its IMS application development system.

The system is said to provide automatic transparent data base access and allows programmers with minimal knowledge of IMS data base and communications processing to produce applications, the vendor said.

A design manual enhancement produces automated documentation when the program is compiled, a spokeswoman said. The documentation includes a description of the files, data bases and their usage and a cross-reference of the fields used in various screens and requests.

Release 4 is also said to provide the ability to read multiple messages and respond to multiple terminals in one execution of a program. The same screen can be used for several applications.

The enhancement is free of charge to current customers. Mark V costs from $80,000 to $100,000, depending on operating system, from the Software Products Group, P.O. Box 1452, Canoga Park, Calif. 91304.

ADP Unveils RDE Service For Payroll

CLIFTON, N.J. — Automatic Data Processing, Inc. (ADP) has introduced a payroll service said to allow users to enter raw payroll data into desktop computers on their own premises for transmission to and processing by ADP.

Remote Data Entry (RDE) reportedly is an alternative method of collecting and editing payroll data for businesses that are using the firm's batch payroll services, according to the vendor.

With RDE, data is entered directly into a desktop computer supplied by ADP — a Data General Corp. MPT/100 machine — thus reportedly eliminating the need to prepare and send handwritten forms to the service.

The computer edits the data and informs the user if corrections are needed, the vendor said.

Information is transmitted over dial-up phone lines to an ADP regional computing center. The system is said to include a security access system, meaningful field descriptions and custom-formatted screen input.

The service averages about $200/mo and does not include a telephone company modem. Based upon number of payees (processing volume), clients can receive a credit toward the cost of their monthly fee, in some cases negating or reducing the fee, a spokesman said. ADP is located at 405 Rt. 3, Clifton, N.J. 07015.

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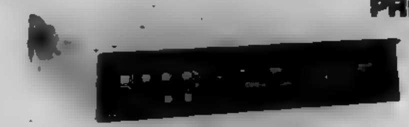

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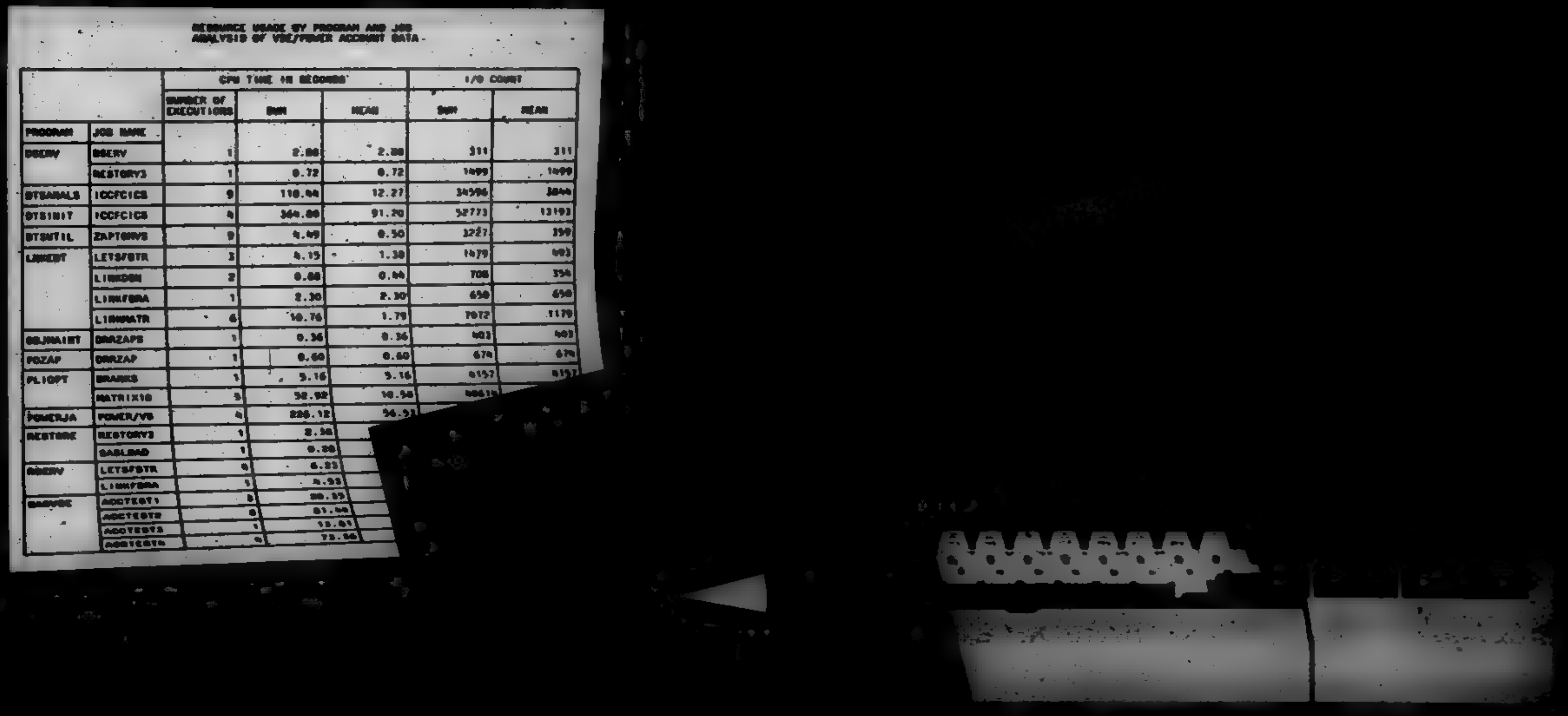

RESOURCE USAGE BY PROGRAM AND JOB
ANALYSIS OF VSE/POWER ACCOUNT DATA

		CPU TIME IN SECONDS			I/O COUNT	
		NUMBER OF EXECUTIONS	SUM	MEAN	SUM	MEAN
PROGRAM	JOB NAME					
DSERV	DSERV	1	2.88	2.88	311	311
	RESTORY3	1	0.72	0.72	1499	1499
DTSANALS	ICCFCICS	9	110.44	12.27	34596	3844
DTSINIT	ICCFCICS	4	364.80	91.20	52773	13193
DTSUTIL	ZAPTORVS	9	4.49	0.50	3227	359
LNKEDT	LETS/FOTR	3	4.15	1.38	1479	493
	LINKDON	2	0.88	0.44	708	354
	LINKFORA	1	2.30	2.30	650	650
	LINKMATR	6	10.76	1.79	7072	1179
OBJMAINT	DRRZAPS	1	0.36	0.36	403	403
PDZAP	DRRZAP	1	0.60	0.60	674	674
PLIOPT	BRANKS	1	5.16	5.16	8157	8157
	MATRIX10	5	52.82	10.56	[illegible]	
POWERJA	POWER/VS	4	226.12	56.53		
RESTORE	RESTORY3	1	2.38			
	SASLOAD	1	[illegible]			
[illegible]	LETS/FOTR	6	6.23			
	LINKFORA	1	4.93			
[illegible]	ACCTEST1	3	[illegible]			
	ACCTEST2	8	81.44			
	ACCTEST3	1	13.01			
	ACCTEST4	4	73.56			

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The SAS System is available outside the USA from the Institute's subsidiaries in Heidelberg, West Germany; Weybridge, Surrey, UK; Wellington, New Zealand; and Sydney, Australia; and from licensed distributors in Tokyo, Japan; Milano, Italy; [illegible] and Singapore.

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Ingres Version 2.0 Announced For Users of VAX-11 Systems

BERKELEY, Calif. — Relational Technology, Inc. has announced Version 2.0 of Ingres, a relational data base management system (DBMS) for Digital Equipment Corp. VAX-11 computers.

The company also announced Report by Forms (RBF), a visual report editor; Graph by Forms (GBF), a graphics subsystem; and Applications by Forms (ABF), an applications development environment. All products are for use on Ingres.

Ingres Version 2.0 includes improvements to the I/O subsystem and internal sort routines and the addition of new query-optimization strategies, a spokesman said. Concurrent access to data by multiple users has been improved and row size has been increased.

RBF provides a facility for visually editing report content and format in a menu-driven system. Users select report options from menus to determine page size, sort order and sequence, data selection criteria and the calculation of summary statistics. Available statistics include sums, counts, averages, minimums and maximums displayed as page totals, subtotals or grand totals.

GBF allows users to specify data for retrieval and the display format without conventional programming, the spokesman said. Formatting controls include graph type, size, layout and labeling. Most common graph types are available. The product supports most graphics terminals, plotters and hardcopy devices.

ABF is said to enable users to create, test, modify and store applications without coding in a computer language, the spokesman said. Applications are created by forms displayed on the screen. Forms cover the basic functions of application programs. They can be defined, modified and catalogued. Command menus may be defined to manipulate data in forms, invoke reports and graphs and control the sequence of forms. ABF automatically selects the appropriate compilers and linkers and identifies problems such as missing modules or faulty syntax, the spokesman said.

RBF and ABF are included at no extra charge with Ingres, which costs $35,000. GBF costs an additional $2,500 per supported license from 2855 Telegraph Ave., Berkeley, Calif. 94705.

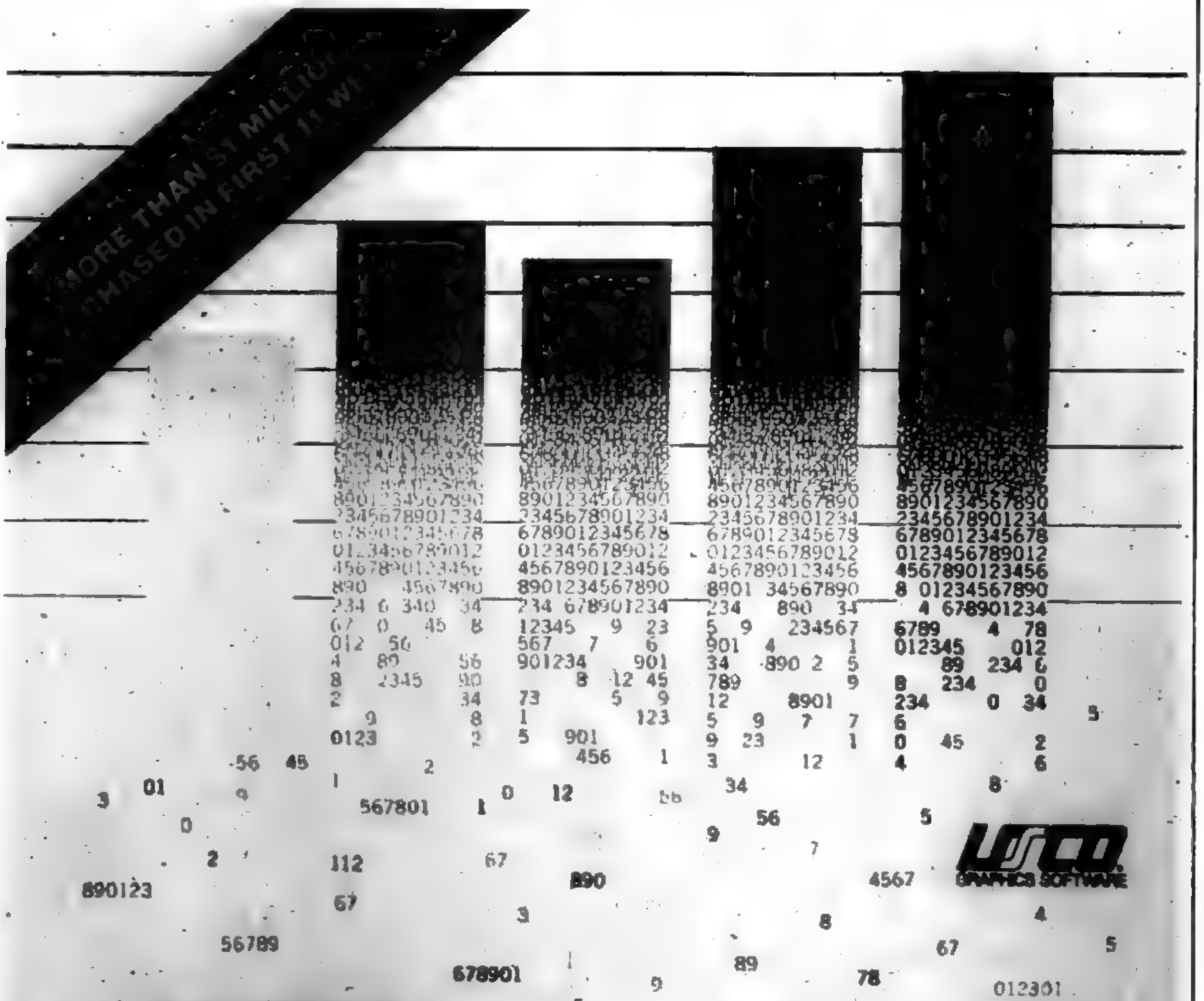
'Calc/34' Model Gets Update

WINTER PARK, Fla. — Westmoreland Systems, Inc. has announced Version 4 of its Calc/34 financial modeling system for the IBM System/34.

Calc/34 is said to generate electronic spreadsheet projections automatically. It features logic capabilities, consolidation of models and access to user files.

Version 4 enhancements reportedly include an external table file, easier passing of data from one model to another and enhanced reporting capabilities.

Calc/34 Version 4 is priced at $2,500. It is available on a 30-day trial period for $100, from the vendor through Suite I, 228 Park Ave. N., P.O. Box 2726, Winter Park, Fla. 32790.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From Boole & Babbage

Release 4.0 of 'Secure/CICS' Out

SUNNYVALE, Calif. — Boole & Babbage, Inc. has announced Release 4.0 of Secure/CICS, an on-line security software package for IBM's CICS.

The enhancement contains Multiple Region Operation (MRO) support, providing centralized administration of security in a multiple-CICS environment, a spokesman said.

The new release also contains password facility enhancements including an automatic password expiration option that enables system-wide specification to require periodic password change.

Secure/CICS now supports the use of identification badges and cards for password changes and sign-on through the operator identification card reader and magnetic stripe reader features, the spokesman noted. An activity logging interface is included which allows user applications to record activity on the Secure/CICS log file. The messages may then be displayed on-line.

For OS operating systems, Secure/CICS is priced at $18,000 (MVS) and $13,500 (VS1). A DOS version costs $11,500 from 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Release 8.1 of 'PMM' System Designed for 4300, 30 Series

ATLANTA, Ga. — American Software, Inc. has announced Release 8.1 of its Purchasing and Materials Management (PMM) system.

The PMM system, for use on the IBM 4300 and 30 series, includes modules for material request, purchasing, inventory control and accounting, procurement matching, accounts payable and capital project accounting.

The material request system reportedly processes requisitions for purchase requests and requests for material from inventory; the purchasing system creates, tracks and analyzes purchase orders; inventory control and accounting keeps up with perpetual balances; and procurement matching compares purchase orders and receipts to the invoice data.

The accounts payable and capital project accounting systems provide invoice processing and project tracking capabilities, according to a spokesman for the vendor.

The price for each system ranges from $20,000 to $70,000. More information is available from the vendor at 443 E. Paces Ferry Road, Atlanta, Ga. 30305.

Apparel Package Serves VAX Line

SANTA MONICA, Calif. — Datapparel, Inc. has announced an automated apparel package for Digital Equipment Corp.'s VAX-11 line of processors.

The package is an on-line interactive group of modular programs written in Cobol. The programs are designed to aid apparel manufacturers in controlling day-to-day processing, the vendor said.

The entire package costs $100,000, but individual modules are available separately. The firm is located at Suite 302, 1300 4th St., Santa Monica, Calif. 90401.

FTU Available For System/34

LITTLE ROCK, Ark. — A File Transmission Utility (FTU) for the IBM System/34 is available from Arkansas Systems, Inc.

FTU reportedly allows the transmission of any size data file from one System/34 to another. With the utility, the sending system operator needs only to know the name of the data file, according to the vendor.

FTU then selects and transmits the data file to the receiving System/34. The operator can either rename the transmitted data file or replace the existing file.

FTU costs $190 from the firm at Suite 202, 8901 Kanis Road, Little Rock, Ark. 72205.

Users to Get Diverse Info

(Continued from Page 61)

creasingly will be used to define goals and prepare strategies. The software "actually does cash outlay and management for you rather than just planning parameters."

In line with this new role, managers can expect few enhancements to the basic functions the packages perform, she predicted. However, tremendous strides will be made in the breadth of information that can be accessed and manipulated.

Kitson advised managers, "Now more than ever, look at the vendor rather than the package." She said the dominant vendors of the future will be those who link information tools together in new and different ways. "We're sitting on so many gold mines and we don't even know it," she said. When looking at a vendor, ask, "Where are they going to be in two or three years and what can they supply me?" she advised.

DP managers also need to improve their sales skills to ensure that management gets the financial information tools it needs, she advised. "First find out what [management's] needs are," she said. "I'd suggest you take [all the literature] you can and disseminate it to them."

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'MPEX/3000' Utility for HP 3000 Users Enhanced

LOS ANGELES — A utility for the Hewlett-Packard Co. HP 3000 series minicomputers has been enhanced to increase programming flexibility and streamline systems development and maintenance.

With the existing version of its MPEX/3000 package, Vesoft Consultants, Inc. has added the ability for programmers to operate on several files simultaneously, a company source said. The utility's latest release allows 3000 series users to purge, copy, rename or otherwise modify multiple files in one operation.

With MPEX's previous releases, programmers had no alternative but to execute these and other commands on one file at a time, the spokesman said.

The addition of a file set handling capability "substantially" boosts the speed and efficiency with which programs can be written under HP's Multi-Processing Executive operating system, the source said. The extent of that improvement, however, is too application-dependent to quantify precisely.

MPEX/3000 has also been enhanced with the addition of previously unavailable selection criteria that reportedly allow programmers to gain access to all files created by a particular individual.

The utility costs $1,500 to install in a primary site and is available from Vesoft at 506 N. Plymouth Blvd., Los Angeles, Calif. 90004.

Dump System Out for VM/SP Users

ARLINGTON, Va. — VM Systems Group has announced a software product that allows a system dump while normal operations continue.

Now available for the IBM VM Systems Product (VM/SP) operating system, V/Snap is a new VM/SP Control Program command that reportedly makes it possible to obtain a formatted system dump for analyzing degradation problems such as slow or uneven performance, hung devices or users and storage management errors without causing a system failure.

V/Snap is implemented as one new Control Program module and an update to one existing module. It can be used on VM/SP Releases 1.0 and 1.1, and a VM/SP Release 2.0 version is under development, according to a vendor spokesman.

V/Snap costs $1,190; source code and updates are furnished and maintenance necessary to conform to IBM system changes will be furnished quarterly, a vendor spokesman said.

More information is available from VM Systems Group, 3123 N. Military Road, Arlington, Va. 22207.

'Robot38' Package Handles Scheduling on System/38

MINNETONKA, Minn. — Help/38 Systems, a division of Advance Circuits, Inc., has introduced a software package for the IBM System/38 computer.

Robot38, an automated computer operator, is an integrated system that executes programs or command language commands at prescheduled times daily, weekly, monthly or on any selected date, a vendor spokesman said.

Its command execution function executes command language commands individually or in a series, reducing the need to write or compile command language programs, according to the spokesman for the vendor.

User programs can communicate with Robot38 through its Autorun facility. Programs run during the day can set up Robot38's job schedule for later that day or night, the spokesman for the firm said.

The system's displays and printed reports document both the present week's job schedule and the prior week's run history.

The package is available at a monthly license fee of $20 per CPU or a one-time charge of $1,190. Help/38 Systems is headquartered at 15102 Minnetonka Industrial Road, Minnetonka, Minn. 55343.

Banks Get Portfolio Service For Two-Year Projections

NEW YORK — Chase Econometrics/Interactive Data Corp. has developed a service to support domestic or international financial institutions in managing their asset/liability portfolios.

The Bank Risk Management System (BRMS) simulates future earnings over a maximum of 24 months by processing balances, forecast rates, maturities, new volume allocation and strategies in conjunction with each other.

BRMS is said to be customizable by the client, can support a variety of management styles and is applicable to very small and very large institutions; it also offers runoff/rollover capabilities, equation-oriented funding/volume/rate strategies and recognition of different tax structures.

Accessible by any terminal, the service carries no subscription fee. Costs are estimated to run from $500/mo to $3,500/mo, depending on the size of the bank, a spokeswoman said. The firm is located at 22 Cortlandt St., New York, N.Y. 10007.

Universe Systems Get RM/Cobol

NATICK, Mass. — Charles River Data Systems, Inc. has announced a version of Ryan-McFarland Corp.'s Cobol (RM/Cobol) for its Universe line of 32-bit computer systems.

RM/Cobol runs under the company's Unos operating systems, a Unix-compatible system with real-time, transaction-oriented capabilities. In multiterminal systems, RM/Cobol can run simultaneously with other supported languages including Basic, Pascal and Fortran.

RM/Cobol is available for $1,300 on the Universe line, which the spokesman said costs under $10,000 from 4 Tech Circle, Natick, Mass. 01760.

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Program Generator System Out for Burroughs CPUs

TALLAHASSEE, Fla. — ESI has announced Proxy, an on-line program-generator system for Burroughs Corp. mainframes.

Proxy allows users to create on-line, interactive, transaction-based programs in Cobol, a spokesman said.

Capabilities include the generation of structured Cobol source code with internal documentation, provision for system documentation and the capability for including specialized user-provided source code in Proxy-generated programs, the vendor said.

Proxy generates programs with interfaces for Burroughs' operating systems, including Gemcos, NDL or any participating or nonparticipating Master Control System, the spokesman said.

Programs support Burroughs DMS II and IBM's Isam and user-defined file access techniques. Code is cross-machine-compatible over all three Burroughs mainframe series, the vendor said.

The price for Proxy ranges from $20,000 to $30,000 from ESI at 1801 S. Gadsden St., P.O. Box 5617, Tallahassee, Fla. 32301.

'Eunice' Users Form Group

PALO ALTO, Calif. — The Wollongong Group has announced the formation of a users group for Eunice, a software package developed by the Stanford Research Institute for transporting Bell Laboratories Unix software to Digital Equipment Corp.'s VAX-11 superminis operating under VMS.

Services and activities of Eunishare will include a worldwide newsletter, a shareable user program library, an annual convention and special interest group and local chapter meetings, according to a group spokesman.

Users qualify for membership by working in a Eunice site or through some other direct interest in Eunice, the spokesman said.

There are no membership fees, and members become eligible to receive the newsletter and program library listing.

More information is available from Eunishare, c/o The Wollongong Group, 1135A San Antonio Road, Palo Alto, Calif. 94303.

Utility Targets System/34

ROCK ISLAND, Ill. — Valley Software, Inc. has announced Compare/34, a utility for System/34 users that compares programming changes and output.

Compare/34 compares spool files, disk files, library members and library directories, a vendor spokesman said. Included with Compare/34 is a file print module that prints selected records from any disk file, a vendor spokesman said.

The cost of Compare/34 is $299 from Valley Software Inc., P.O. Box 909, Rock Island, Ill. 61201.

Accounting System Runs on VS

BURNABY, B.C. — A route accounting system for Wang Laboratories, Inc. VS systems has been developed by P.M. Sulcs & Associates Ltd.

The on-line, interactive Route Accounting System is said to combine inventory, order entry and order management. The system is suited for the food and beverage industry, according to the vendor.

Features include rerouting of orders, super-route accumulation, summary of purchases for statements, wholesale and corporate rebating including drop-delivery rebating and call-order schedules by operator.

The system costs $40,000 with multi-CPU rates available from the firm at Suite 112, 4240 Manor St., Burnaby, B.C., Canada V5G 3X5.

ADS Release Said to Aid Paperless Documentation

ATLANTA — Documentation Systems, Inc. has announced a release of its Automatic Documentation Systems (ADS) said to facilitate paperless documentation.

ADS comprises four separate products that run independently or as an integrated system, according to a spokesman for the firm. ADS reportedly interprets a job's Job Control Language and optional input to produce a standardized set of documentation for IBM's MVS, VS1 or SVS operating systems.

Release 3.0 features on-line interfaces to other system components, standardized job recovery procedure generation, load module analysis and a foreground-initiated JCL validation.

ADS costs from $6,500 to $19,600, depending on components. Rental and lease plans are also available. Additional information can be obtained from the ADS marketing group: Leland Computer Services, Inc., Suite 146, 8601 Dunwoody Place, Atlanta, Ga. 30338.

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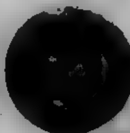

's. DEC, Lear Siegler, TeleVideo, Hazeltine, ADDS, etc, etc, etc, etc ASCII CRTs become 3270 terminals. ASCII printers, Qume, Epson, Okidata, etc, etc, etc become 3287 printers.

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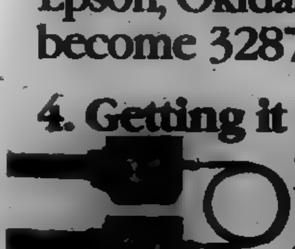

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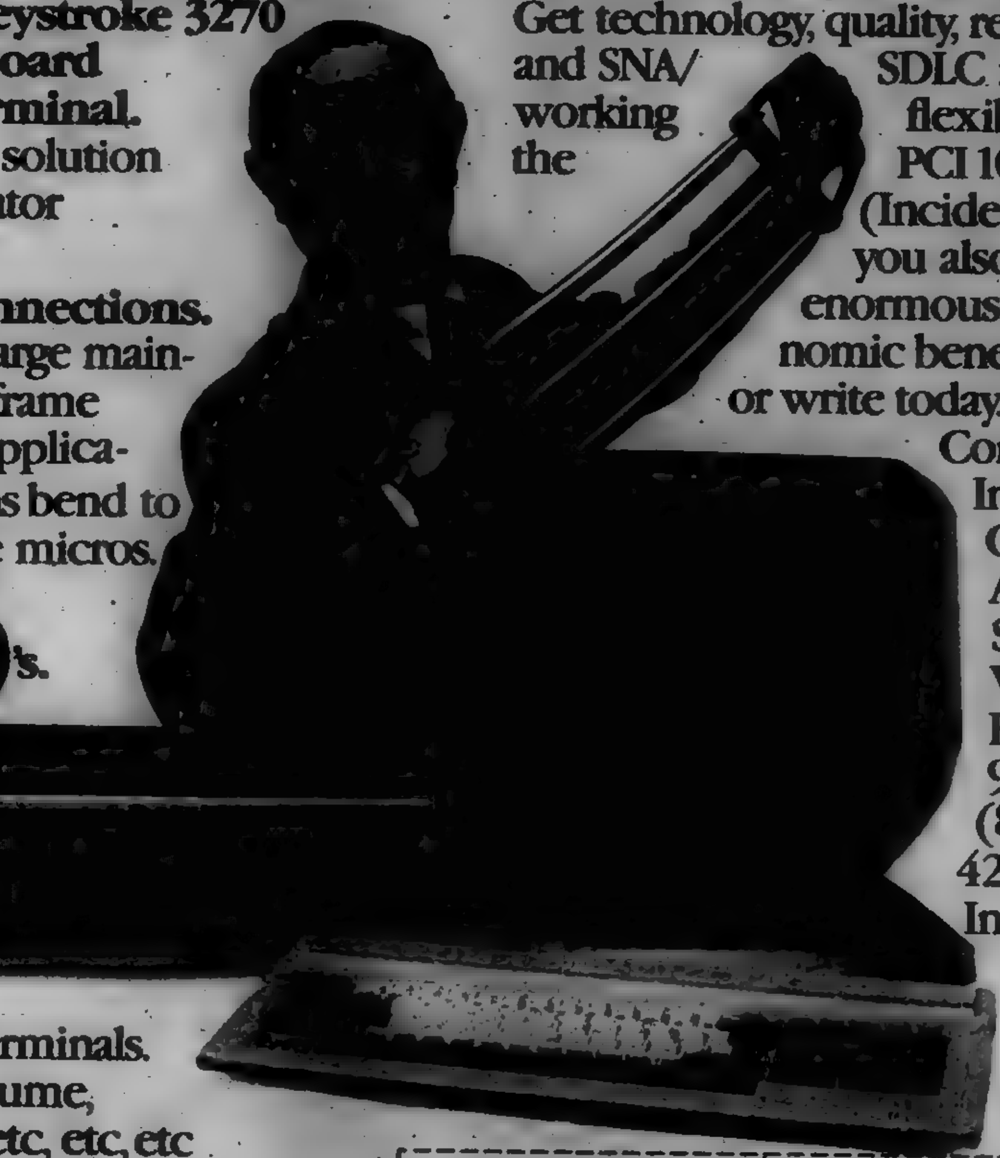

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'Topdoc' Package Updated

LOS ANGELES — DP Software Exchange, Inc. (DPSE) has announced the latest release of its computer-generated operations documentation package, Topdoc 4.1, said to contain significant enhancements over previous versions.

Topdoc was designed and developed for IBM DOS/VS and DOS/VSE systems and is said to provide standardized operations documentation and a fill-in-the-blanks turnover procedure for programming staff. Enhancements included in Release 4.1 are computer/machine scheduling with automatic job scheduling, cross-reference reports, master systems lists and job flow chart diagrams, the vendor said.

Multiple machines or multiple CPUs may be utilized, each having multiple partitions, the vendor said. Version 4.1 of Topdoc leases for $195/mo from DPSE at P.O. Box 34863, Los Angeles, Calif. 90034.

For Geometric Modeling

Formats Enhance 'Romulus'

SALT LAKE CITY, Utah — Evans & Sutherland, Inc. has announced two formats of its Romulus solid geometric modeling program.

Executable Romulus, a binaries-only version, is available for applications requiring no modification to the standard capabilities. Programmable Romulus is enhanced with enough source software to facilitate an integration of the solid geometric modeling capabilities into an application solution.

Romulus offerings are now available on the IBM 4300 and 30 series; MVS and VM/CMS are both supported. The software is also available on Digital Equipment Corp. VAX-11/780, 11/750 and 11/730, Evans & Sutherland PS 300 graphics system and Tektronix, Inc. 4010 and 4014 terminals.

Romulus prices start at $30,000 for a perpetual license from P.O. Box 8700, 580 Arapeen Drive, Salt Lake City, Utah 84108.

'Datascan' Release Announced

ATLANTA — Datascan America has announced Release 4.0 of its Datascan information retrieval and reporting system for users of Datapoint Corp. and IBM System/34 minicomputers.

The new release includes a dictionary program that is said to simplify dictionary creation and maintenance and supports multiple record-type files. Report writer features and numeric editing capabilities have been added. Datascan Graphics, an option, can be added for data analysis with bar graphs and histograms.

Prices start at $1,850 from Suite 222, 4675 N. Shallowford Road., Atlanta, Ga. 30338.

Personnel Aid Fits System/34

LAS VEGAS — Computer Information Systems (CIS) has announced its Automated Payroll and Personnel Systems written for the IBM System/34.

The CIS system reportedly allows users to create a human resource data base as well as control all areas of specialized payroll requirements, such as tips, temporary help, accruals and unions. Features include control of up to 999 locations, a report generator, general ledger interface and user-controlled security.

Complete education, documentation, training and tax service are provided by the vendor. The Personnel System is available as a stand-alone for $3,750; combined with the Automated Payroll System, the cost is $7,600, a spokeswoman said. The first year of maintenance is included in the price. CIS can be reached through P.O. Box 18000, Suite 84, Las Vegas, Nev. 89114.

Tool Analyzes Mailing Costs

LOMBARD, Ill. — A mass mailing optimization package that runs on IBM mainframes in OS and DOS environments has been developed by List Processing Co., Inc.

The Mailing Optimization Procedures System (Mops) reportedly analyzes mass mailings to determine the least expensive sacking procedure. Mops analyzes postage, handling and other costs for any second- or third-class mailing.

Mops costs $10,000 from the vendor at 555 Waters Edge, Lombard, Ill. 60148.

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CAP Methodology Answer to Netron's Wish List

By Lois Paul
CW Staff

NEW YORK — It was the quest for truly reusable code that led Netron, Inc. to devise its Computer-Aided Programming (CAP) methodology.

According to Paul G. Bassett, vice-president of software manufacturing for the Toronto-based firm, the product essentially was based on a wish list his development group compiled after they tried out traditional approaches for getting around the maintenance problem inherent in software development efforts. What it came up with is reusable code.

Among the traditional approaches Netron tried were subroutines. Although they are a step in the right direction, Bassett said, they lack the customizing facility that true reusable code requires. When customization of subroutines is required, the programmer can either change it and "clobber" all the programs that called this code or store a slightly altered version of it in the subroutine library. "Soon you begin to drown in a library with a sea of routines."

The issue of reusable code has not really been addressed by high-level and fourth-generation languages, according to Bassett. He cited the nature of these languages as their own downfall. "Because they have powerful verbs and operators, these act as sledgehammers. One does a tremendous amount. But in sophisticated systems, often one wants a tack hammer. A delicate interplay is required and precise notation. Fourth-generation languages are clumsy languages because all you do is hit things with a sledgehammer.

"Code generators have not taken the world by storm," he continued, "because they only help programmers at the beginning stages." The least time-consuming part of the programmer's job is writing programs rather than polishing and maintaining them, he said.

Development Methodology Incorporates Reusable Code

(Continued from Page 61)

executable versions.

According to Bassett, the specific source text retained in a computer-generated program is efficient since the system drops irrelevant or redundant logic. Common code is stored only once in production libraries, he noted.

Netron currently has CAP products for interactive screen input and output, file maintenance and reporting implemented on Wang Laboratories, Inc.'s VS line of minicomputers. These tools are accessed by the Capenvironment, a sort of programmer's workbench.

The entire package is available for $30,000 from Netron at 99 St. Regis Crescent N., Downsview, Ont. M3J1Y9, Canada.

Security Service, Guide Available

PENNSAUKEN, N.J. — A service that addresses the management and implementation of data security and control systems is available from Auerbach Publishers, Inc.

Practices and Methodologies: Data Processing Security and Control: An Analysis, Design and Evaluation Guide is included with the service. It reportedly provides the information to identify assets open to risk, analyze the level of exposure to threat and determine what assets have priority.

The service also will help subscribers match potential safeguards to potential risks; select effective safeguards based on objective cost/benefit analysis; outline software, hardware, personnel and procedures required to implement a plan and construct objective acceptance.

The service includes access to the firm's Telephone/Telex Information Service and two on-line newsletters. The service costs $225 with a free no-risk 15-day trial available. Auerbach is located at 6560 N. Park Drive, Pennsauken, N.J. 08109.

Options Announced For Aims Subscribers

CANOGA PARK, Calif. — Informatics General Corp. has announced that Supplied User Option (SUO) software is available to subscribers of the company's Annual Improvement Maintenance and Support (Aims) service.

SUOs provide more simplified installation of Informatics software, extension of the products to a wider scope of applications and the ability to prototype future product enhancements, the company claimed.

SUOs, which come in the form of application source code, user routines and installation support aids, are available for the company's Mark V, Mark IV, Answer/2, Answer/DB, Trans IV, Inquiry IV/IMS and Shrink products.

Prices vary depending on the products and options involved. Informatics is located at 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

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On May 18th, *Computerworld* launches its first communications satellite . . .

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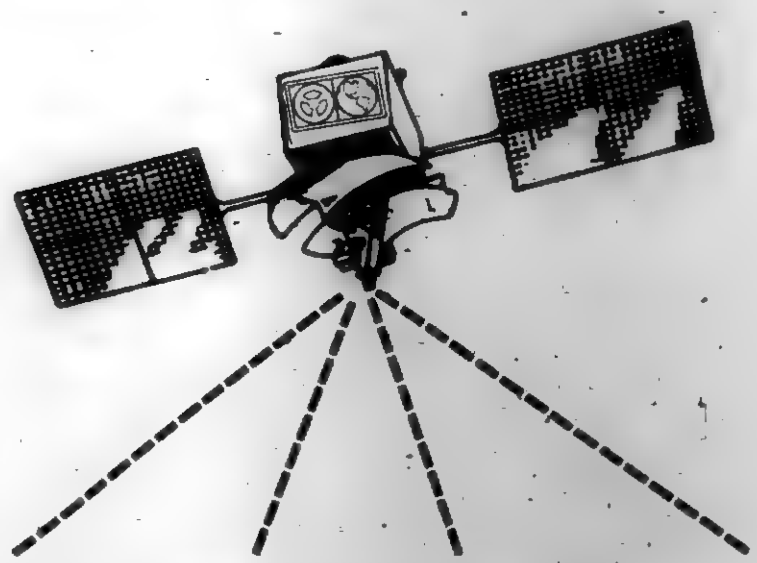

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Remember to look for *Computerworld On Communications* on May 18th and again on September 28th (advertising deadlines April 8th and August 19th).

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To Lessen Data Distribution Woes

Snet May Acquire 40% Interest of DTI

By Bruce Hoard
CW Staff

NEW HAVEN, Conn. — Innovative Southern New England Bell (Snet) may mitigate the problem of local data distribution by acquiring a 40% interest in Digital Termination Service, Inc. (DTI).

If the iconoclastic Bell operating company decides to go through with the deal, it would be buying into a company that that has been authorized by the Federal Communications Commission (FCC) to build and maintain intrastate high-speed digital data transmission facilities in 99 of the largest U.S. metropolitan areas.

The local data distribution problem has been a thorn in the side of long-haul common carriers such as satellite companies and other wideband common carriers. They move information at high speeds over thousands of miles only to be frustrated by drastically reduced transmission speeds in the local loops.

Digital termination systems (DTS) such as those to be offered by DTI early next year bypass the local loops by transmitting data in microwaves from local earth stations directly to the final termination point at customer premises.

Snet is allowed to offer such advanced services because it is not burdened by restrictions placed on the other 22 Bell operating companies AT&T is spinning off as part of its reorganization, according to spokesman Mike McCann. Only Snet and Cincinatti Bell have been spared the restrictions, he said.

The reason for Snet's unusual status is its unusual relationship with AT&T — Bell owns only 24% of Snet. As a result, the Bell operating company has been designated a "nondominant carrier," in the modified final judgement governing the AT&T breakup.

McCann said Snet — whose operating area lies within the state of Connecticut — does not foresee DTS-type services obsoleting the less sophisticated local loops. "We see a coexistence in the future," he declared.

In a press release issue describing the possible deal with DTS, Snet Chairman and Chief Executive Officer Alfred Van Sinderen mentioned the possibility of linking DTS with "leased interstate digital services." That combination would allow DTS to provide direct coast-to-coast digital service.

Since the beginning of the year, the operating company has made a series of

(Continued on Page 80)

Concord Data Offers Token/Net To Comply With IEEE 802, Ecma

WALTHAM, Mass. — Concord Data Systems has unveiled a local-area network communications system designed to meet the needs of factories, engineering facilities and offices, especially in a medium-size to large campus or multiple-computer business environment.

Token/Net is reportedly the first local-area network to comply fully with the IEEE 802 and European Computer Manufacturers Association standards for local networks.

The network features a data transfer speed of 5M bit/sec at distances up to 20 miles and uses the token passing line access scheme, which defines a set of rules for sharing the high-speed network bandwidth. Token passing is a form of distributed polling that is highly controllable

(Continued on Page 83)

Data, Voice Time Division Mux Allows Link Minus Leased Lines

HYANNIS, Mass. — Fibronics International, Inc. has introduced a data and voice time division multiplexer said to allow users to communicate within their own facility without using leased lines.

The FM-832 multiplexer can transmit up to 128 data channels, 128 voice channels or any combination of data and voice over a dual coaxial or fiber-optic cable, according to a vendor spokesman. Fiber-optic cable allows transmission distances up to two miles and coaxial cable up to ½ mile.

Each port is said to be independent. Available rates exist at 64K bit/sec in the synchronous mode and 1,200 bit/sec in asynchronous transmission in the auxiliary ports.

The multiplexer is enclosed in a 19-in. rack mount and can accept up to eight communications modules. Each module can support voice or data transmission. Depending on the application, the data modules can support RS-232C or RS-449 with eight to 16 ports per module, a vendor spokeman said.

Prices for the multiplexer start at $5,600. It is available from Fibronics International Inc., 218 W. Main St., Hyannis, Mass. 02601.

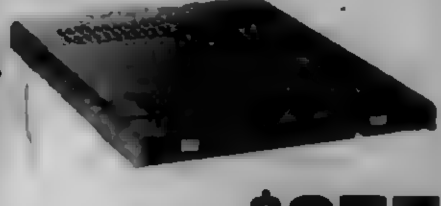
IBM to Operate Net In 1984, FCC Says

WASHINGTON, D.C. — IBM plans to begin operating a data communications network next January, the FCC reported here last week.

Utilizing two-way radio channels and portable transceivers equipped with alphanumeric keyboards and small display screens, the system will enable IBM service technicians to communicate on-line with each other and with a company computer center. Motorola, Inc., which is building the terminals for IBM, plans to market them to others later this year, according to a spokesman. He indicated that traveling sales personnel would be likely prospects.

The system will be used to assign IBM field service technicians who work on intermediate and large-scale information processing systems, said a company spokesman. It will also handle a variety of communications chores that

(Continued on Page 80)



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Stratus Unveils Adapter, SDLC Link, Others

NATICK, Mass. — Stratus Computer, Inc. has unveiled a communications line adapter, Synchronous Data Link Control (SDLC) product programmable bus interface, X.29 software support, GTE Telenet communications Corp. certification and a remote service network.

The C107 Smartsync line adapter supports communications protocols at speeds up to 56K bit/sec, performing the line handling and protocol tasks normally done on a CPU or communications subsystem. A Stratus/32 Continuous Processing System processing module can support up to 12 of the adapters, while a Stratus/32 system of 32 processing modules can support up to 384. The C107 Smartsync line adapter is available immediately and priced at $1,500.

The SDLC software product is used in conjunction with the Smartsync communications line adapter. It is said to form the foundation for future Stratus Systems Network Architecture (SNA) products. It will cost $3,000 and will be available in the third quarter of 1983.

The Programmable Stratabus Interface (PSI) is a high-speed, programmable interface between the Stratus/32 bus and up to four non-Stratus peripheral devices. It is a full-size printed-circuit board that plugs into the Stratus/32 backplane. It can transfer data at up to 4M byte/sec, the vendor claimed. Available in September, it will cost $15,000.

The X.29 networking facility is designed for the Stratus/32 and uses a single synchronous communications line to connect multiple remote terminals to application programs running on the Stratus/32. The remote terminals can be connected through a proprietary packet assembler/disassembler (PAD) or a public or private packet switching network. It will be available for license in June 1983 for $1,000.

The Stratus/32 system has been certified for connection to the GTE Telenet Communications Corp. Telenet public packet switching network. The certification allows nodes using the vendor's Stratanet software to communicate using Telenet by means of a direct interface to the network.

With the new remote service network, Stratus computers with hardware or software failures will automatically dial up and request service. The service is free of charge to the vendor's maintenance customers.

Stratus is located at 17-19 Strathmore Road, Natick, Mass. 01760.

Modem Line, I/O Card Out

BUFFALO, N.Y. — Universal Data Research, Inc. has announced a line of modems and an I/O card that automatically selects the correct transmission rate.

The line of seven modems is designed to connect to any RS-232 interface terminal or processor using telephone lines. Three of the modems feature transmission rates of 300 bit/sec and are available in half- and full-duplex modes with originate or autoanswer versions.

In addition, the vendor is offering two modems designed to operate at 1,200 bit/sec. These units provide full-duplex operation with a switch-selectable local echo, the vendor said.

The vendor is also offering two modems that are compatible with Bell 212A modems. Those modems are available in autodial and autoanswer versions and can be equipped with an I/O board that automatically tests the transmission rate and makes adjustments, the vendor said.

The Universal Data Research modems cost between $149 and $599, the vendor said from 2457 Wehrle Drive, Buffalo, N.Y. 14221.

Artel Module Sends Video

WORCESTER, Mass. — Artel Communications Corp. has introduced a fiber-optic computer graphics communications system said to transmit high-resolution computer-generated video further than can be transmitted with conventional coaxial cable.

The T/R-2011 is a plug-in transmit/receive module that transmits RS-170 video up to 10,000 ft over fiber-optic cables. Both red-green-blue color and monochrome video signals can be handled by the system.

Prices for the transmit/receive modules begin at $1,850. More information is available from Artel Communications Corp., P.O. Box 100, West Side Station, Worcester, Mass. 01602.

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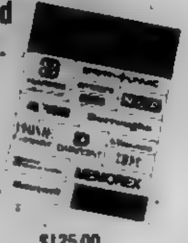

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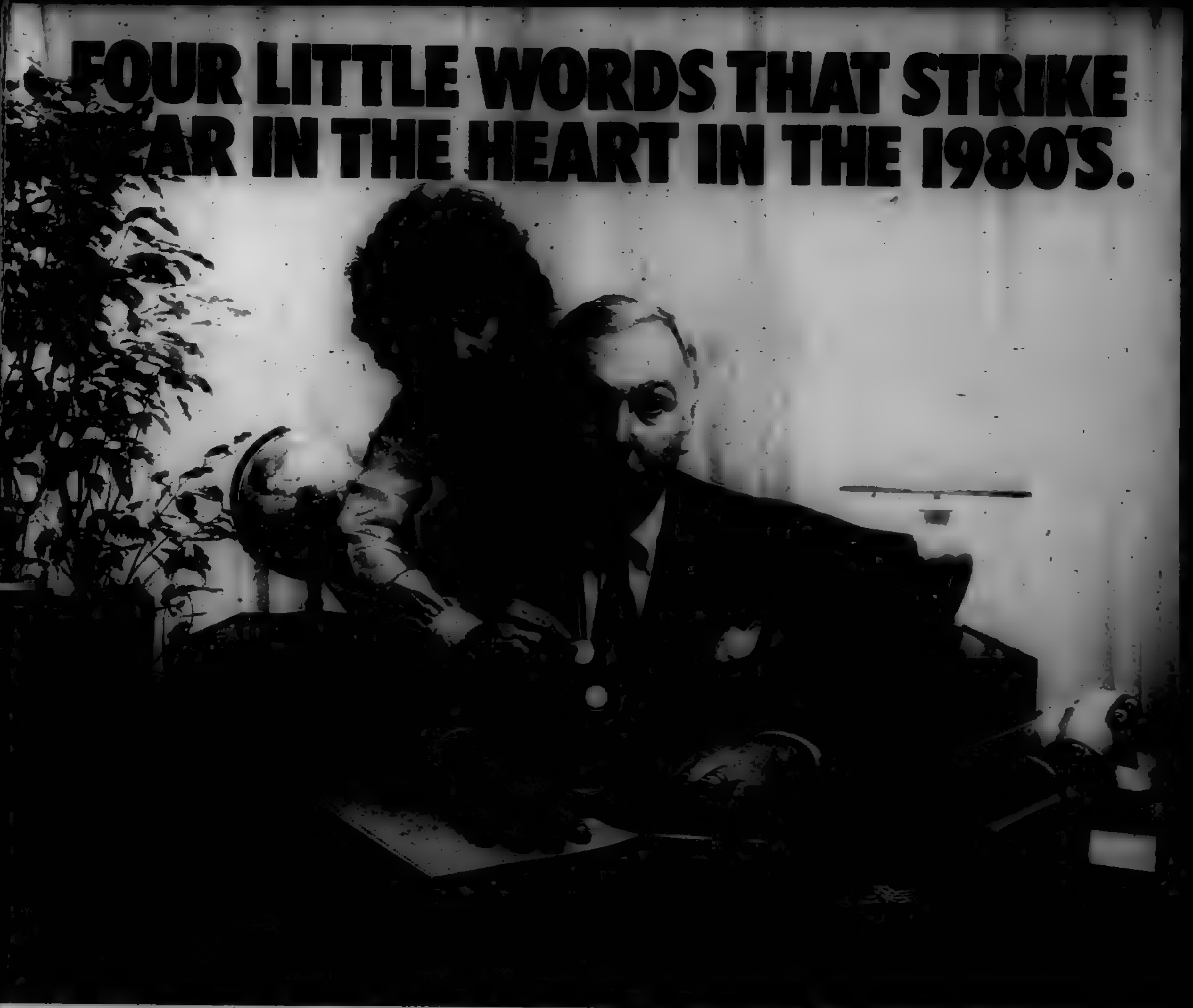

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Stratus's hardware design means that fault tolerance is invisible to your application programs and users. You can even move previously developed applications to Stratus with NO CHANGES and NO PERFORMANCE LOSS for fault tolerance. In contrast, the software-based systems require complex, performance-stealing software in order to implement fault tolerance. This means that new programs are more difficult to develop, they run slower, and existing programs can't be run without major changes.

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IBM Plans to Operate Network in 1984

(Continued from Page 77)

occur during the service call — for example, the serviceman will be able to input orders for new parts. The spokesman said IBM expects to reap substantial benefits from the system — notably a reduction in service order paperwork and an increase in the productivity of its field service staff.

In addition to a qwerty keyboard and two-line, 54-char. LCD screen, the terminal is said to be programmable in IBM's 6800 family assembly language and can be acoustically coupled or hardwired to a standard telephone. The terminal measures 4 in. by 7 in. by 1.5 in. and weighs 1.5 lb, the IBM spokesman said. He added that the company expects to have the network in full operation by mid-1985, at which time about 250 cities will be interconnected.

The area serviced by the network will be divided into zones; within each there will be a transmitter and one or more receiving sites. These facilities will enable terminal users to communicate with each other and with a centrally located IBM computer that handles work assignments, parts orders and related message traffic.

A "general communications controller will track each portable terminal so that messages and acknowledgements to and from field personnel are directed to the appropriate zone," said the FCC, which released an order last week permitting IBM to implement the system.

Micro-Baud Offers Interactive Modem

SANTA CLARA, Calif. — Micro-Baud Systems, Inc. has announced an interactive, stand-alone 212A modem said to feature synchronous and asynchronous modes.

The unit reportedly includes pulse or tone and combinations; 8-, 9-, 10- or 11-bit standard operation; and parity selection.

The Model MB80514 is list-priced at $675 from 3393 De La Cruz Blvd., Santa Clara, Calif. 95050.

Snet May Get DTI Interest

(Continued from Page 77)

moves designed to push itself away from being only a horizontal supplier of telephone service. They include the formation of a susidiary known as Soneacar Systems, which will market sophisticated customer premises equipment such as private branch exchanges (PBX).

Toward that end, it has signed agreements with Northern Telecom, Inc., Mitel Corp. and TIE/Communications, Inc. which call for those PBX makers to sell their systems to Snet, which will in turn market them to its customers.

The firm is reshaping its future relationship with Western Electric, the manufacturing arm of AT&T that has traditionally provided PBX equipment to Bell operating companies. According to McCann, agreements between all the Bell operating companies and Western Electric are expiring Jan. 1, 1984.

Negotiations are currently being carried out to establish a new agreement. "We intend that Western Electric, even after the breakup of the Bell system, will be a supplier of Southern New England Telephone," he commented.

Snet has until mid-April to consider the 40% DTI acquisition. In the interim, it is studying DTI's business plans as well as its own future. McCann said the company might nix the deal for the same reason it has stayed away from manufacturing its own products — the fear of being overextended.

No matter what the final decision will be, Southern New England Telephone Co. is racing full speed into the unregulated communications future.

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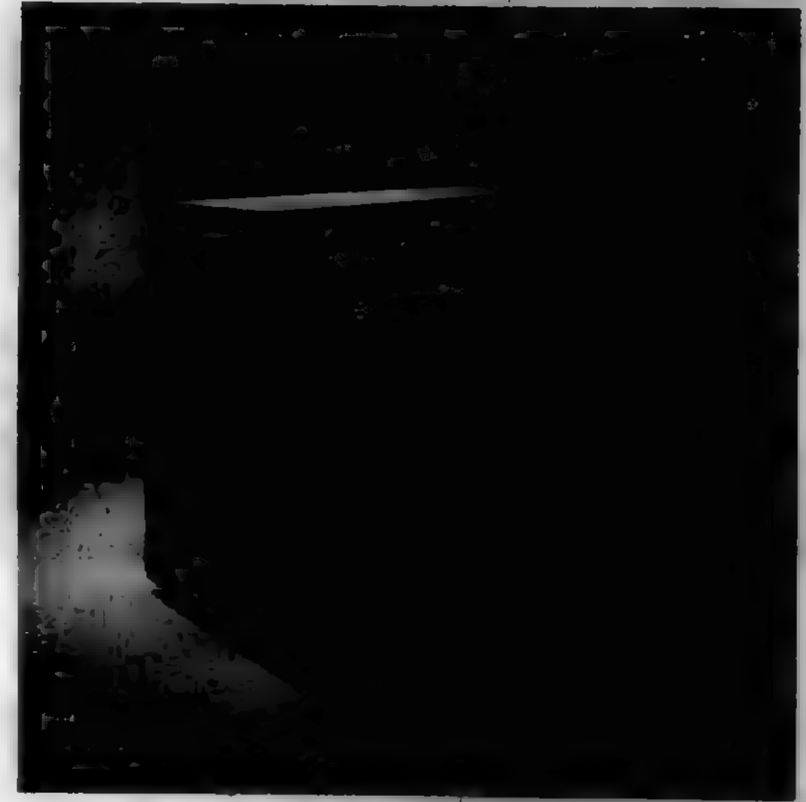

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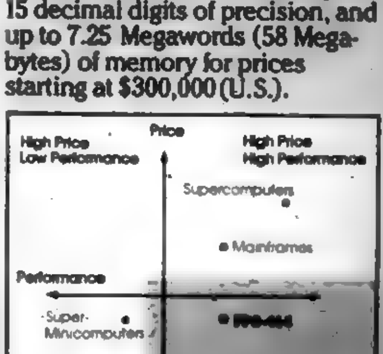

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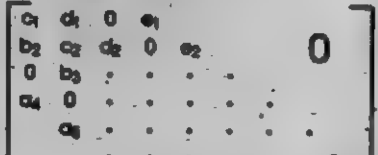

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Package Boasts IBM CPU, Ethernet Net Connection

AUSTIN, Texas — Auscom, Inc. has introduced a communications software package it claims will connect any IBM mainframe to the Xerox Corp. Ethernet local-area network.

The interface utilizes direct channel connection to an IBM mainframe and Ethernet hardware and software on the outboard side.

It is available for $17,000 from Auscom Inc., Suite 102, 2007 Kramer Lane, Austin, Texas 78758.

Protocol Converter Gets Enhanced

CAMBRIDGE, Mass. — ICCI has announced both enhancements and a price reduction for its protocol converter.

The CA20 protocol converter replaces an IBM 3274 Model 51 cluster controller operating with either Binary Synchronous Communications (BSC) or Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) protocol in an IBM 3270 network, according to a vendor spokesman.

The cost of the CA20 protocol converter has been reduced 20% to $6,900 for either the BSC or SNA/SDLC, the spokesman said. ICCI is located at 196 Broadway, Cambridge, Mass. 02139.

Filtering Screen Offered

SANTA CLARA, Calif. — A filtering screen said to eliminate glare and sharpen the image on a CRT screen is available from Inmac Corp.

The Glare Sentry incorporates a circular polarizer and is said to trap up to 99% of reflective light.

Priced at $139, the screen is available from Inmac, Department 82, 2465 Augustine Drive, Santa Clara, Calif. 95051.

CRT Unit Labels Maps

BEAVERTON, Ore. — Tektronix, Inc. has introduced a CRT terminal said to provide high-density graphics and high-density alphanumerics for labeling designs and maps.

The 4116A Computer Display Terminal also features a 635mm Direct View Bi-Stable Storage Tube said to provide a 4,096- by 3,120-pixel viewable resolution and smooth contour lines. More than 15,000 characters can be displayed simultaneously, according to a vendor spokesman.

The terminal is priced at $21,400 from Tektronix, Inc., P.O. Box 500, Beaverton, Ore. 97077.

Alpha Micro Adds AM-60

IRVINE, Calif. — Alpha Micro, Inc. has announced a CRT terminal that can reportedly be used with any computer system in the firm's line.

The AM-60 features a tilting/rotating screen display, detachable keyboard, horizontal/vertical split screen capability and line-drawing character set. It also features programmable function keys and programmable status lines.

The unit reportedly can be used with any Alpha Micro system from the seven-user desktop computer to the 60-user AM-1062 supermicro.

The price ranges from $880 to $1,000, depending on capabilities, a spokesman said. The firm can be reached through 17332 Von Karman, P.O. Box 18347, Irvine, Calif. 92714.

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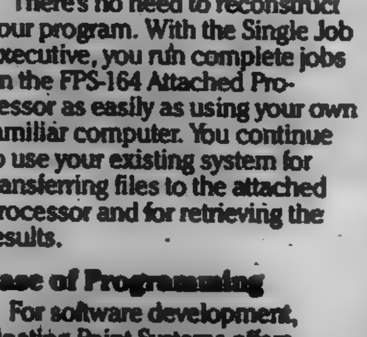

A Math Library with over 410 FORTRAN callable subroutines is also available.

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For IBM Micro

Modem Runs at 300 Bit/Sec

VAN NUYS, Calif. — Anchor Automation, Inc. has unveiled a modem for the IBM Personal Computer said to feature a transmission rate of 300 bit/sec and having Bell 103 compatibility.

The Signalman Mark VI modem reportedly also offers tone and pulse dialing and full autoanswer/autodial programmability. It was designed for direct connection to any modular telephone and wall jack and fits directly into any of the expansion slots in the Personal Computer's Systems Unit, thereby replacing all communications hardware inside the computer, the vendor said.

The Mark VI also eliminates the need for an asynchronous communications card in one of the remaining slots by incorporating the necessary asynchronous communications circuitry as part of its overall design.

Along with the modem and software, the vendor is also providing a free subscription to The Source, a data base designed for personal computer users. The Signalman Mark VI, complete with software, instruction manual and The Source subscription, costs $279. Anchor Automation is located at 6624 Valjean Ave., Van Nuys, Calif. 91406.

Recorder Stores Status Changes

CARROLLTON, Texas — Beta Products, Inc. has introduced a sequential events recorder (SER) said to feature a distributed event memory technique capable of storing up to 128 status changes on each input.

The Betalog Model 420-I SER monitors discrete inputs and records status changes with true 1 msec resolution, the vendor claimed. It has a capacity of up to 128 inputs in a single cabinet and is expandable to 1,024 inputs. An auxiliary RS-232 output port allows duplication of information.

The starting price for the recorder is $5,700 from Beta Products, Inc., P.O. Box 5004, 1615 W. Beltline Road, Carrollton, Texas 75006.

Net Meets IEEE, Ecma Standards

(Continued from Page 77)

and stable under all network loads, a spokesman said.

The system can operate on either baseband or CATV-compatible broadband cable systems, but is initially oriented to CATV systems in order to achieve the extended distances required for larger facilities.

Four levels of priority are available to be assigned to each data port. The highest priority frames are transmitted whenever a node holding them gets the token.

The Token/Net Interface Module (TIM) is the interface to the local network. It is available in two different base unit configurations. The TIM-200 is comprised of three printed-circuit assemblies: the radio frequency modem; access unit and control unit. It costs $3,500.

The TIM-220 is similar to the TIM-200 except that it provides two additional card positions in the basic unit and a larger power supply. It is primarily intended for an office or engineering area where there is a cluster of terminals and/or other data equipment. It costs $4,000.

The Network Management Processor (NMP) provides certain high-level network functions including network software reload and privacy key management. These functions may be "semidistributed" in that more than one NMP can be installed in a network at the same time. It costs $6,500 from Concord Data Systems at 303 Bear Hill Road, Waltham, Mass. 02154.

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Kimtron Unveils Update Of ABM 85 Display Unit

SANTA CLARA, Calif. — Kimtron Corp. has announced the ABM 85H CRT display terminal, a new version of the current ABM 85.

The H model features a detached tactile touch keyboard, high-resolution P31 display, monitor mode and 128 displayable character codes. Two RS-232C ports are used for asynchronous communications; both are bidirectional and have a data transfer of up to 19.2K bit/sec, a vendor spokesman said.

Additional features of the ABM 85H include user-programmable answer back, function key and attribute storage in nonvolatile memory, hidden attributes and graphics and mathematics symbol character sets, the spokesman said.

Options include up to 8 pages of data storage and a 1,200 bit/sec modem. The control, escape and keyboard codes can be customized for OEM contracts, according to a vendor spokesman.

The cost of the ABM 85H is $865 or $795 prepaid. More information is available from the vendor at 2225-I Martin Ave., Santa Clara, Calif. 95050.

Honeywell Tool Targets Multics

PHOENIX — Honeywell, Inc. has introduced communications software said to allow its DPS 6-based processor to serve as a satellite for its Multics large-scale computer systems.

Satellite 6M provides capabilities for remote batch, file transfer and remote terminal concentration to the Multics host, according to a vendor spokesman.

It permits remote batch to operate in a multithreaded mode with multiple card readers and printers.

File transfer between the satellite and host Multics systems can be accomplished in both directions, the spokesman said.

The package also allows up to 32 terminals to be concentrated onto a single communications circuit. Any Honeywell Multics-supported terminal may be used as an interface with Satellite 6M, the vendor spokesman claimed.

The package will be available in the fourth quarter of 1983 for an annual license fee of $995. More information is available from Honeywell Information Systems, P.O. Box 8000/T-60, Phoenix, Ariz. 85066.

Digilog DLM V Isolates Faults

MONTGOMERYVILLE, Pa. — A data communications monitor/analyzer said to have full keyboard programmability has been announced by Digilog Inc.'s Network Control Division.

The Digilog DLM V reportedly isolates faults in any data communications center or field service situation.

The device features a menu-driven programming language consisting of 15 instructions and 11 commands. Each test program can be up to 72 steps in length, according to a vendor spokesman.

The DLM V also features an erasable read-only memory where up to 10 named programs can be stored simultaneously and an optional Digilog MSU IV dual-diskette subsystem, the spokesman said.

The lower-priced DLM III and DLM IV can both be upgraded to a full-keyboard DLM V, the spokesman said.

The DLM V costs $5395 from the vendor at 1370 Welsh Road, Montgomery, Pa. 18936.

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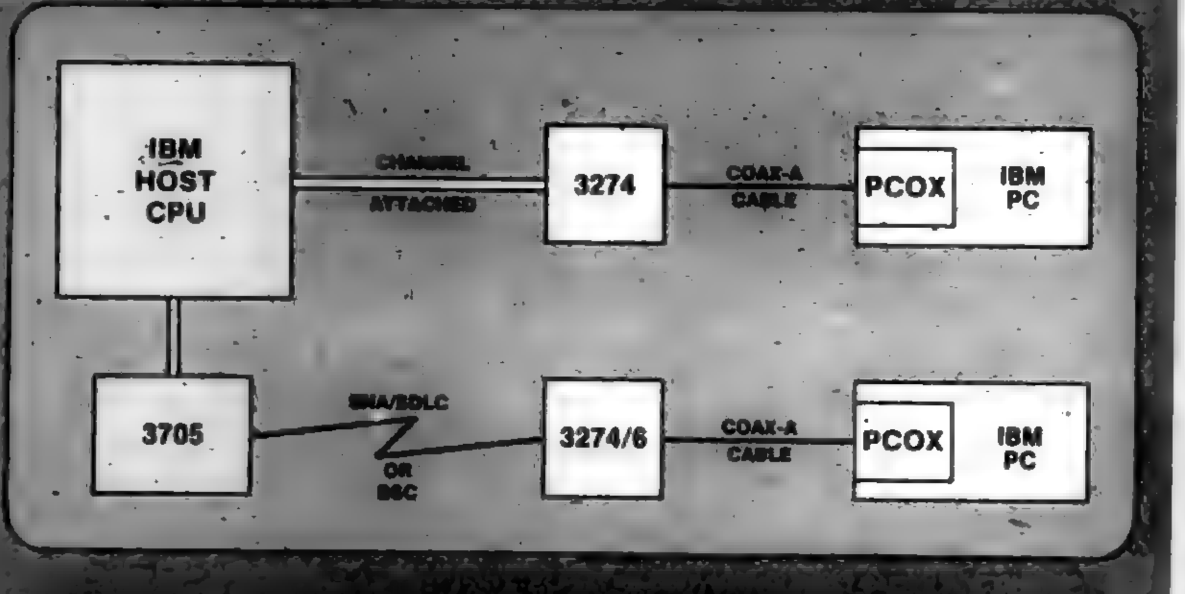

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Canoga Data Systems Out With Fiber-Optic Mux

CANOGA PARK, Calif. — Canoga Data Systems has introduced the CMX-4T1 fiber-optic multiplexer, said to be versatile enough to multiplex four T1 channels onto a single fiber, transparent to the incoming T-1 signal.

The CMX-4T1 reportedly is compatible with T-1 speed variations and can be used in the DP environment as well as in telephone company applications.

With its own integral power supply, the multiplexer can be powered from standard ac line voltages. It uses fiber-optic transmission cable for interference-free transmission, the vendor said.

Typical applications for the multiplexer include computer-aided design and manufacturing systems and data links such as multiplexer outputs where several low-speed channels are multiplexed into one 1.544M-bit data stream.

The CMX-4T1 is priced at $66.50 from Canoga Data Systems, 21218 Vanowen, Canoga Park, Calif. 91303.

Dial-Up Encryption Device Bows

MIAMI — Racal-Milgo, Inc. has unveiled an encryption device designed to safeguard data on circuit-switched, dial-up networks.

The Dial-Up Datacryptor II operates in half- or full-duplex modes, synchronously or asynchronously, and at data rates up to 9,600 bit/sec. The device reportedly can create and downline load new session keys for each modem connection and, when the modems disconnect at session's end, will erase the key at both ends of the link.

Three models are available — a central unit, Model 3400, and two remotes, Models 3500 and 3600. Only the Model 3400 can generate master keys. Prices start at $2,300 from 8600 N.W. 41st St., P.O. Box 520399, Miami, Fla. 33152.

Carterfone Unveils VDT

DALLAS — Carterfone Communications Corp. announced the VDT 920-1, a standard Televideo, Inc. 920 display terminal with an integral Bell 212A-compatible modem.

Standard features include a printed circuit board, keyboard-initiated autodial using a pulse-dial technique, a microprocessor-based design and software implementation offering self-test idle mode.

The VDT 920-1 has a list purchase price of $1,615. Maintenance and one- to three-year licenses are available from Carterfone Communications, located at Suite 1400, 1111 W. Mockingbird Lane, Dallas, Texas 75247.

Digi-Data Corp. Announces Tape Drive

JESSUP, Md. — A cartridge tape drive from Digi-Data Corp. is said to have an integral intelligent controller that emulates RS-232C asynchronous protocol and is also compatible with computer systems operating with RS-232C-type communications devices and peripherals.

The Model 70R includes a 2K-byte buffer expandable to 8K bytes and reportedly supports up to four disk drives. Standard firmware reportedly allows off-line tape-to-tape copy without host interaction in dual-drive configuration.

The unit will store up to 17.3M bytes of unformatted data at data rates from 75- to 19.2K bit/sec. Prices range from $2,290 to $2,380 from 8580 Dorsey Run Road, Jessup, Md. 20794.

Modem Out By NCR Comten SNA-Compatible

ST. PAUL, Minn. — NCR Comten, Inc. has introduced a synchronous diagnostic modem said to be compatible with IBM's Systems Network Architecture (SNA).

The 7164 modem transmits at 4,800 bit/sec and offers network diagnostics that can be automatically initiated by a host or controlled by the operator, according to a vendor spokesman. It is a microprocessor-based modem that transmits in full-duplex mode over four-wire circuits and operates over voice-grade leased lines.

The modem will be available in June for $3,700 from NCR Comten, Inc., 2700 Snelling Ave. N., St. Paul, Minn. 55113.

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Computerworld/Mexico talks to computer people south of the border.

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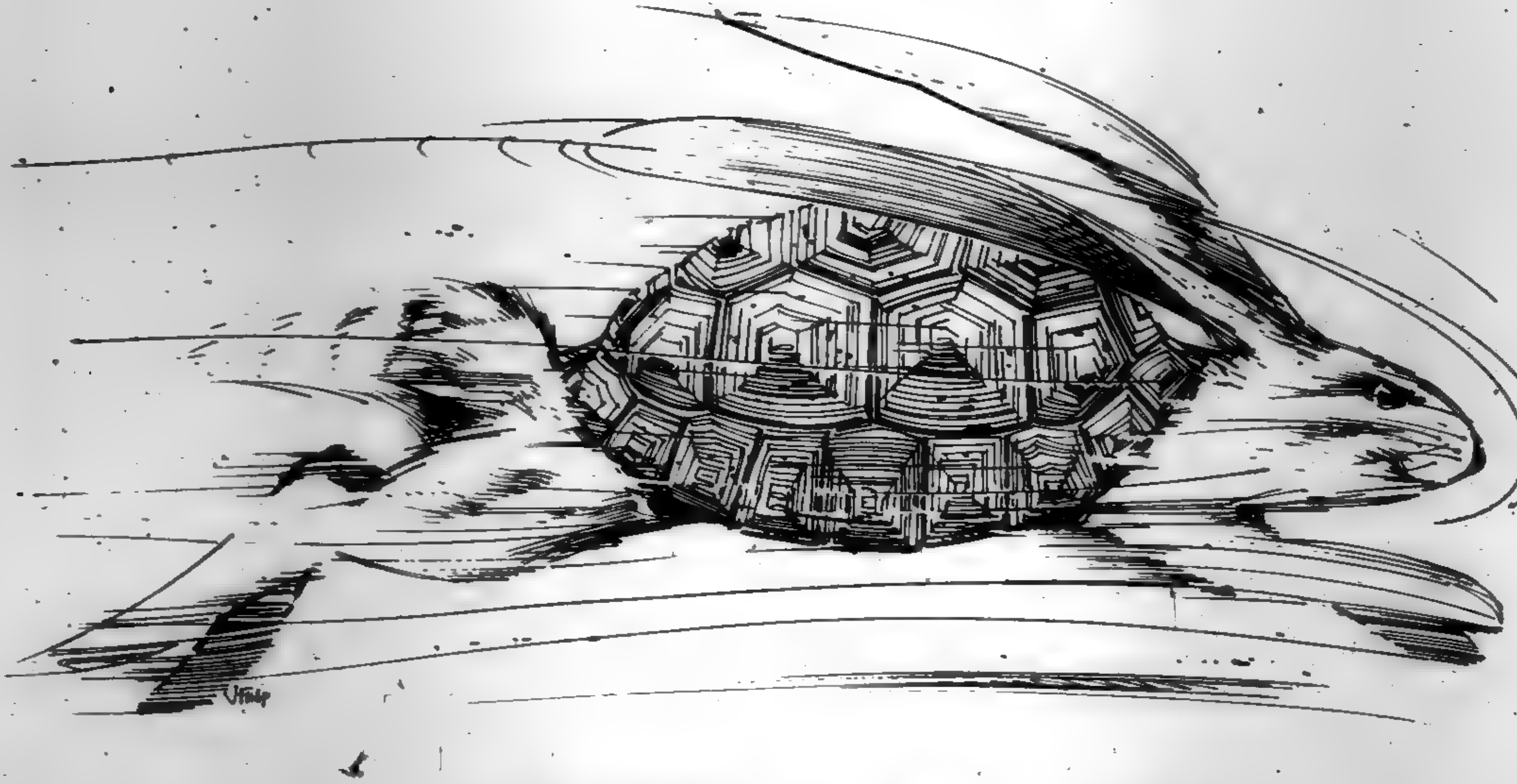

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No software or operating modifications are required. The device plugs straight into the Storage Technology 3600 series tape subsystems, and can increase total cable length to over 500 feet.

To find out more, call your local Storage Technology office, clip the coupon, or call (303) 673-4063.

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14

Primarily for Scientific Applications

Supermini Produces Fast Results for Firm

LONG BEACH, Calif. — How does one of the nation's largest geotechnical and environmental consulting firms bring together its nearly 30 disciplines and its own financial management system to provide cost-cutting and time-saving results?

Earth Technology Corp. (Ertec) found the solution in a Harris Corp. 800 superminicomputer. The system has reportedly enabled the company to perform the data processing mandated by projects requiring expertise in the geosciences, airborne imagery, geotechnical engineering, the environmental sciences and mining engineering. Approximately 70% of all computer usage at the company involves scientific applications, while 30% is devoted to financial management.

"We need a versatile computer that has a large capacity," said Hudson Matlock, Ertec's vice-president of research and development.

"The end product of our efforts is information. Information en masse. Information of all kinds. It can be descriptive or numerical, and that's where the computer comes in."

Matlock said Ertec places heavy demands on its computer — data acquisition, processing, storage, retrieval, graphics and analysis. The company must be able to process data quickly and present information in a manner consistent with its clients' specific needs, he explained.

"For example, earthquake engineering is an important component of our engineering activities. We have to know about seismicity, how the forces are generated, how the forces are transmitted and how a structure will react to such forces.

"Sophisticated and massive analyses are involved from a mechanistic standpoint. The development of many analyses or structural models may be required to determine the deformation of soil layers. So computer modeling of physical systems under static loading, wave loading, wind and dynamic loading, blast and impact is definitely important," Matlock said.

Prior to deciding to buy its own computer, Ertec was using time-sharing services. Two years ago, it was spending $20,000 each month on computer processing, according to Zafar Sutarwala, manager of computer services. Today, he said, that figure would be closet to $200,000 per

(Continued on Page 92)

Earth Technology's Harris 800 superminis go on the road (right) for on-site geotechnical analyses, as well as at headquarters for more traditional business applications (above).

IBM Unveils 3430 Tape Drive To Rival Its Model 3410 Line

RYE BROOK, N.Y. — IBM has unveiled a magnetic tape drive that reportedly packs about 3.5 times the data rate and storage density of its current line of Model 3410 drives.

The IBM 3430 magnetic tape subsystem, which incorporates many of the performance characteristics of the IBM 3420, can operate with IBM System/38 Models 4, 5 and 7, as well as with virtual storage IBM 370 Models 135 through 168 and the 4300 and 30 series of processors, according to the vendor.

Data rate, storage and reliability improvements achieved with the 3430 are the result of group coded recording, a method of magnetic tape recording used on high-performance models of the 3420 series, IBM said. The 3430 can reportedly read and record data at up to 6,250 byte/in. at speeds up to 312,000 byte/sec, compared to the 3410's maximum speed of 80,000 byte/sec.

Improved reliability is achieved through the use of large-scale integration design features, fewer, denser, more reliable circuits and a new diagnostic package, the vendor explained.

The microdiagnostic package is said to have better error detection because of an automatic error-checking feature that polls all internal circuits. In addition, enhanced error logging provides comprehensive information to service personnel to help isolate and resolve problems faster.

IBM 3430 Magnetic Tape Subsystem

The 3430 tape drives are connected independently to their respective control unit, and any drive in the subsystem can reportedly be taken out of operation without interrupting the function of the other units.

Available in two models, the 3430 Model A1 consists of a tape control and one tape unit housed in a single enclosure. The Model B1 is a single tape unit. Purchase prices are $33,400 and $16,900, respectively. General availability is slated for the third quarter of 1983.

Further details are available from IBM at 900 King St., Rye Brook, N.Y. 10573.

Turnkey System Features 'Microbol'

SUNNYVALE, Calif. — Advanced Electronics Design, Inc. has unwrapped a 16-bit, multiuser turnkey system for small business applications that features Microbol, an integrated software package containing the operating system, programming language, disk file processor and applications program.

Using Digital Equipment Corp.'s LSI-11/23 processor, the Freeport is capable of supporting up to seven users simultaneously. The system's basic configuration consists of a 5¼-in., 10M-byte hard disk and 500K-byte floppy disk, 256K bytes of random-access memory, the Freeport terminal and keyboard. The price for this configuration is $14,995.

Additional terminals with keyboards can be added to the system at a cost of $1,495 each.

The applications software portion of the Microbol package includes an integrated accounting package made up of payroll processing, spreadsheet, budget calculator, point-of-sale, word processing, mailing list and electronic mail capabilities. General packages are separated into modules containing all elements of each accounting function, allowing each module to operate alone, a spokesman said.

Freeport is available through Computerland retail stores, according to the vendor at 440 Potrero Ave., Sunnyvale, Calif. 94086.

CDC 16-Bit Micro Boasts Multiterminal Capability

GREENWICH, Conn. — Control Data Corp. has announced a 16-bit microcomputer that offers multiterminal capability.

The CDC114 Series A system is available with large-capacity disk for on-line information storage and retrieval and flexible disk backup. A basic system, comprised of one CRT, a 20M-byte hard disk, one floppy disk backup, 512K bytes of random-access memory, the Microsoft, Inc. Xenix operating system and one financial management application, sells for under $15,000.

Further details may be obtained from CDC at 500 W. Putnam Ave., Greenwich, Conn. 06836.

T100 Micro Unveiled

TUSTIN, Calif. — Toshiba America, Inc. has unveiled a microcomputer intended for business and home applications built around its T-Basic language and running under the Digital Research, Inc. CP/M operating system.

Aimed at small business operators, the T100 features three standard memory units, up to 560K bytes of external floppy disk memory, several I/O video screen offerings and high-resolution color graphics, the vendor said. For main memory, the T100 features 64K-byte random-access memory (RAM); it also uses a 32K-byte read-only memory for the T-Basic language and 16K-byte RAM for video.

An entry-level configuration including keyboard and CPU costs $795. A version with a green display and two floppy disk drives featuring a total of 560K bytes of memory sells for $2,385 from 2441 Michelle Drive, Tustin, Calif. 92680.

Sixteen-Bit Micro Debuts

IRVINE, Calif. — Micro Five Corp. has announced the Model 1540 16-bit microcomputer.

The unit features up to 19M bytes of hard disk storage, 128K bytes of main memory, a 1M-byte floppy disk drive, a 5¼-in. form factor and two RS-232 ports, the vendor said.

The unit costs $8,995 from 17791 Sky Park Circle, Irvine, Calif. 92714.

Disk Drives Target IBM Micro

CANOGA PARK, Calif. — Interface, Inc. has announced a series of 5¼-in. Winchester disk drives and subsystems for the IBM Personal Computer.

The drives are available with 5.3M, 10.6M and 15.9M bytes of formatted storage, a vendor spokesman said. Each disk drive subsystem includes the 5¼-in. Winchester drive, cabinet, power supply, cable, connector and I/O adapter, according to a vendor spokesman.

The drives have a track density of 345 track/in., and track-to-track access time is 2 msec with an average access time of 85 msec, the vendor said.

Additional features include a 512-byte full-sector buffer and a 32-bit error correction control, according to the vendor.

Prices for the disk subsystem range from $1,695 to $2,295 depending on memory capacity. More information is available from Interface, Inc. at 7630 Alabama Ave., Canoga Park, Calif. 91304.

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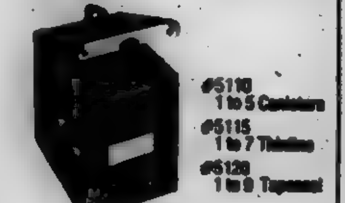

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Fixed/Removable Disks Unveiled

GOLETA, Calif. — DMA Systems Corp. has extended its line of 5¼-in. Winchester disks by unwrapping two fixed/removable disks.

Dubbed the Micro-Magnum 26F and 39F, the disks hold up to 26M and 39M bytes of unformatted storage, respectively. Users can integrate more than one 26F or 39F into a system, a spokesman said. For instance, a 39F can be coupled with one of the company's 5/15 disks, equipping a system with an unformatted storage capacity of 58.5M bytes, he explained.

The company attributes the disks' capacity-flexibility to the use of servo technology embedded into both the fixed and removable portions of all its disk drives.

Evaluation units of 26F will be available during the second quarter of this year with 39F samples available in the third quarter.

The 26F costs $990 while the 39F lists for $1,250, the vendor said from 601 Pine Ave., Goleta, Calif. 93117.

Micro Offers 5¼-In. Drives

SANTA BARBARA, Calif. — Polymorphic Systems, Inc. has introduced an 8-bit microcomputer that reportedly offers 1M byte of floppy disk storage on two 5¼-in. "half-height" drives.

With the "half-height" floppy disk drives, the machine's chassis is kept to a mimimum — 5½-in. high, 15 in. wide, 17 in. deep.

The System 8810/2 costs $4,439. Further details may be obtained from Polymorphic Systems at 460 Ward Drive, Santa Barbara, Calif. 93111.

IBM CPUs Get Service Plan

FRAZER, Pa. — The Sorbus Service Division of Management Assistance, Inc. (MAI) has introduced a preventive and remedial maintenance service plan for the IBM Models 3031 and 3033, the 4300 series and plug-compatibles.

The 24-hour, 7-day/week service is available to mixed-vendor computer shops for approximately 20% less than what IBM charges, Sorbus said. For the 30 series, Sorbus will dispatch site field engineers, when required, on a full-time basis. Also, Sorbus offers remote diagnostic capabilities for the IBM 4300 series.

Pricing is contingent upon job requirements, Sorbus said. The company has 160 locations across the country. Further details on the service plan for the IBM equipment can be obtained from its headquarters at 50 E. Swedeford Road, Frazer, Pa. 19355.

Display Card Targets IBM Micro

BRISBANE, Calif. — United Suppliers, Inc. has announced a video display card for the IBM Personal Computer.

The display card features both the IBM monochrome display card with printer adapter and the IBM color graphics display card. The combined units fit into one expansion slot on the micro's backplane, the vendor said.

An additional feature is 32K bytes of on-board memory. This, the vendor said, gives users two pages of high-resolution graphics that can be used to facilitate animation or other high-demand graphics.

The display card costs $499 and is available from 3785 Bayshore Blvd., Brisbane, Calif. 94005.

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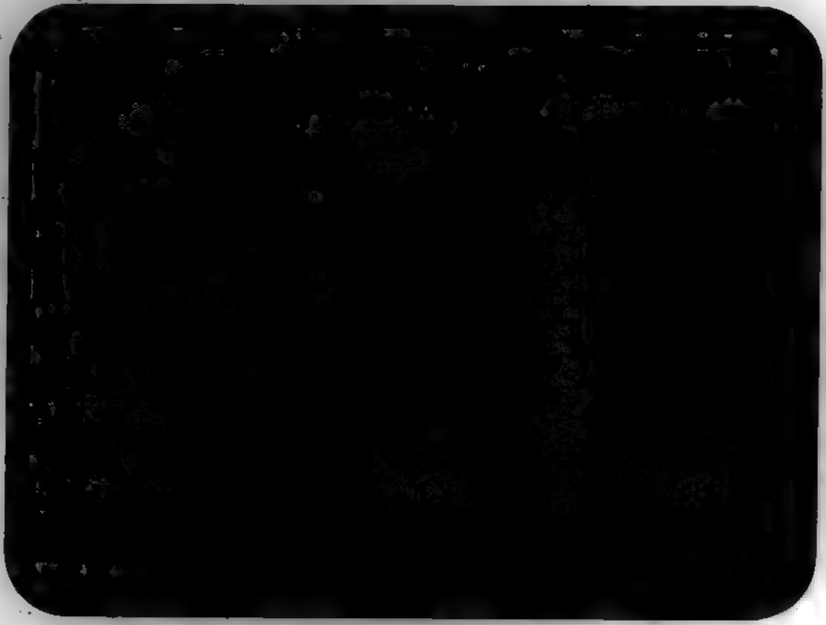
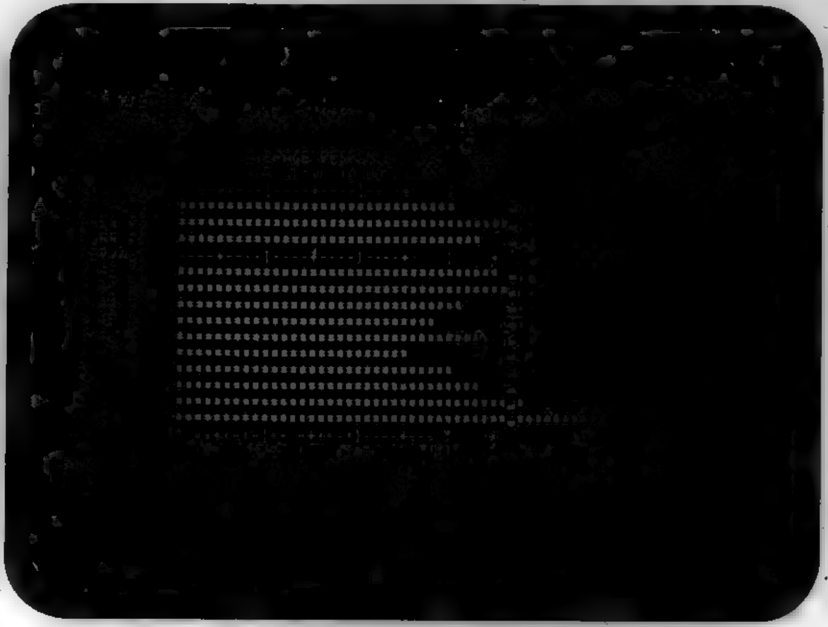


Slowdowns in response time are usually caused by transactions waiting for some IMS resource. WORKLOAD WAIT eliminates guesswork by quickly showing you exactly *where* the bottleneck is — so you can concentrate on solving the problem rather than trying to find it.



The on-line IMF MONITOR PLOTS present the activity patterns for the hundreds of monitored IMS items. They show you whether exceptions are transient, or trending toward a problem condition. Activate the Automatic Screen Refresh, and a response time plot is a continuous realtime picture of user service delivery.

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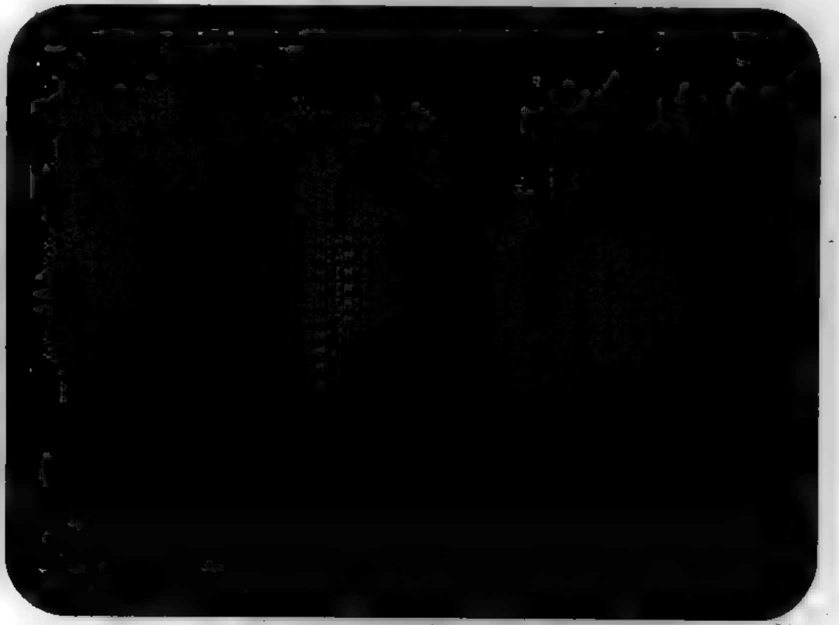

TRANSACTION QUEUE STATUS actually displays the transactions sitting on the input queue. Another unique IMF feature, it's far more than a simple display of queue status — it shows you exactly what user work is sitting in the queue waiting to be processed.

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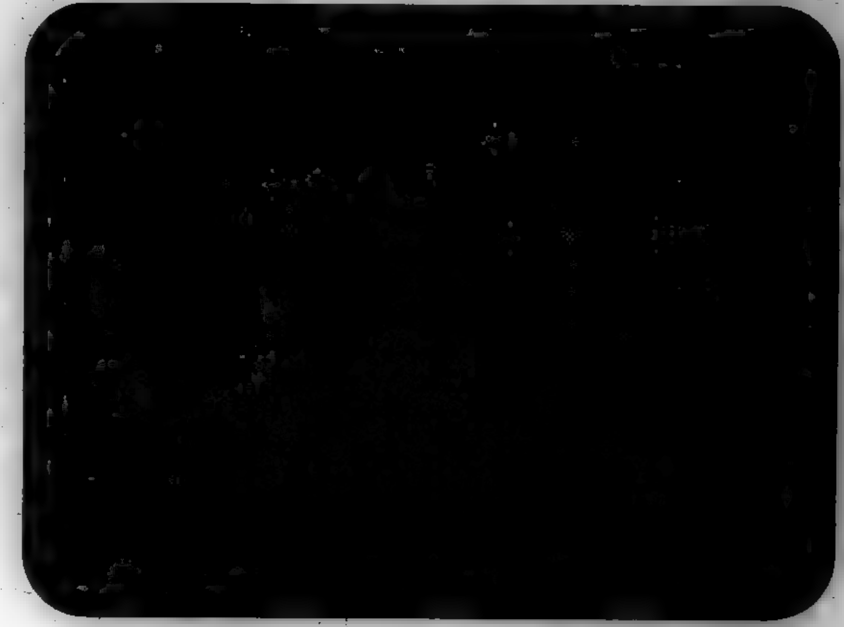
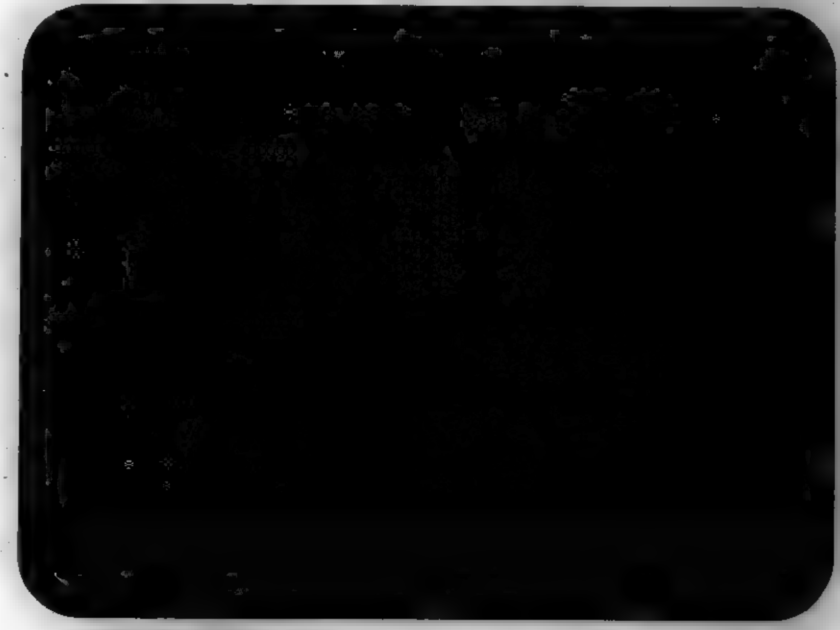


A time-saving first step in analyzing IMS operation, the SYSTEM STATUS display tells you at a glance whether or not things are okay. Should further analysis be required, you can select specific areas to investigate with the IMF analyzers.

WORKLOAD TRACE, an entirely unique service, provides a detailed, on-line trace of the life of any transaction — or group of them — inside IMS. Unlike IBM'S DC Monitor, it shows you only what you want to see — immediately, and without the high overhead.



DISPATCHER STATISTICS gives a quick summary of activity across all active IMS processing regions, showing whether MVS is providing the service you expect the SRM to deliver. This lets you see if IMS is getting the resources needed to process the work.

SCHEDULING STATISTICS shows unsuccessful as well as successful schedule attempts. It also indicates the reasons why attempts have failed, allowing you to take appropriate corrective action quickly, without the traditional trial-and-error guesswork.

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NEW VISIONS IN SYSTEMS MANAGEMENT.

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Turnkey Mini System Out For Sales Representatives

ELK GROVE, Ill. — Management Info. Inc. has announced the Sales Management and Control System, a turnkey minicomputer system for sales representatives.

The system features tracking of actual sales to forecasted sales, tracking of all quotes and samples to assure follow-up and tracking of commissions due by principal, forecasting and performance reports, the vendor said.

The system is based on a Computer Automation, Inc. 16-bit processor with 128K bytes of random-access memory and between 10M and 40M bytes of Winchester disk storage. Also included is a CRT display terminal and a dot-matrix printer. Systems cost between $17,000 and $24,000, depending on the configuration, the vendor said from 180 Crossen, Elk Grove Village, Ill. 60007.

Contractors Get Micro

ATLANTA — The Contractor Microcomputer Services Division of Bradbury & Co. has announced a portable microcomputer for the construction industry.

Based on a Nonlinear Systems, Inc. Kaypro II microcomputer, the unit, called "The Contractor's Dream Machine," was designed for use in field offices.

Features include 13 standard software programs, including a payment application, a Digital Research, Inc. CP/M scheduling package, an estimating package and a shop drawing/submittal control package, the vendor said.

The processor comes with a keyboard, CRT terminal, processor with integrated disk drive and a carrying case. The unit costs $4,995, the vendor said from 3609 Shallowfield Road, Atlanta, Ga. 30340.

Apple Micros Get Voice Module

KALAMAZOO, Mich. — MCE, Inc. has announced a voice input module for Apple Computer, Inc. Apple microcomputers.

The MCE Voice Input Module (VIM) is intended for use by educators, executives, word processors, programmers, the handicapped or any user desiring voice recognition capability, the vendor said. It will reportedly operate on any Apple II or Apple IIe software by voice without software modification. It is said to recognize anyone's voice, has an unlimited vocabulary and features utility software to accomodate building, editing and training vocabulary.

VIM costs $825, the vendor said from 157 S. Kalamazoo Mall, Kalamazoo, Mich. 49007.

Model RBS-DC Supplies Backup

OKLAHOMA CITY, Okla. — High Technology Software Products, Inc. has announced a reserve power supply for the Franklin Computer Corp. Ace computer.

The Model RBS-DC is said to supply instantaneous backup power during power outages and brownouts. One hour and 45 minutes of backup is provided to allow uninterrupted computer operation for short failures or for an orderly shutdown during an extended outage.

The system costs $325 from the firm, through P.O. Box 60406, 1611 N.W. 23rd St., Oklahoma City, Okla. 73146.

Firm Saves Time With Supermini

(Continued from Page 87)

month.

"We selected four superminicomputers for benchmark testing: Prime [Computer, Inc.], Digital Equipment Corp., Perkin-Elmer [Corp.] and Harris [Corp.]," Sutarwala reported. "The Harris was about 50% faster than DEC's VAX-11/780 and 50% to 60% faster than the Perkin-Elmer 3240. With our company's growth rate, that speed [difference] couldn't be ignored."

Harris' operating system provided the versatility that Ertec sought, according to Sutarwala: "We can let the users do what they want, yet restrict them in certain storage spaces without having to tweak the machine constantly."

Subsequently, the company is shifting more and more projects onto the system.

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Workstation Fits Burroughs

SALT LAKE CITY, Utah — Microwest Terminal Systems, Inc. has announced the MTS 183, a workstation that is compatible with Burroughs Corp. systems architecture.

Designed to operate under Digital Research, Inc.'s CP/M operating system, the MTS 183 consists of one field-tested, Burroughs-compatible terminal; a Zilog, Inc. Z80-based microcomputer with dual minidiskette drives; and a variety of application programs and utility programs with documentation, the vendor said.

The MTS 183 costs $3,995, the vendor said from 1473 S. 1100 East, Salt Lake City, Utah, 84105.

Keyboard Runs With Apple II, TRS-80, Ace

FORKED RIVER, N.J. — Creative Computer Peripherals, Inc. has announced an auxiliary keyboard called Keywiz Very Intelligent Peripheral (VIP) that consists of 31 user-programmable function keys in one case.

Each of the 31 keys can be programmed with up to eight characters and programmed again while depressing the shift key, providing the user with 62 user-defined keys. Four such keyboards are stored in the device's memory, making 248 preprogrammed keys available to the user at the touch of a button, the vendor explained.

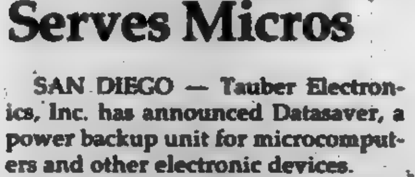
Keywiz VIP runs with Apple Computer, Inc.'s Apple II and IIe microcomputers, Radio Shack's TRS-80 Model IIIs, and Franklin Computer Corp.'s Ace micros. It costs $299, the vendor said from Aztec Environmental Center, 1044 Lacey Road, Forked River, N.J. 08731.

Power Backup Serves Micros

SAN DIEGO — Tauber Electronics, Inc. has announced Datasaver, a power backup unit for microcomputers and other electronic devices.

The unit is designed to ensure data integrity during power failures or blackouts. It automatically switches to backup power within 1/100 of a second. In addition, an alarm sounds and a panel light alerts users to a power problem, the vendor said.

The unit is available in a 90W unit which costs $375 and a 200W unit priced at $675. The vendor is located at Suite 314, 4901 Morena Blvd., San Diego, Calif. 92117.



'Oh, the Serpent Left That Here. I Believe He Called It an Apple.'

Microdisk Enhances IBM XT With Larger Hard Disk Options

GARDNERVILLE, Nev. — Microdisk, Inc. has announced an enhancement to the IBM Personal Computer XT system that replaces the machine's 10M-byte Winchester disk drive with a hard disk of 20M, 27M or 54M bytes of memory, a vendor spokesman said.

The Microdisk upgrade comes with a menu-driven operating system; also available is an option, called 1DOS Operating System.

Prices range from $1,300 to $3,000, Microdisk said from 1422 Industrial Way, P.O. Box 1377, Gardnerville, Nev. 89410.

Series FC2500 Keyboard Offers Multistation Keys

ELMHURST, Ill. — Illinois Tool Works Cortron, Inc. has unveiled a low-profile keyboard with full-surface, multistation key tops.

The Series FC2500 keyboard — injection-molded Noryl with a nonglare matte finish — features a solid-state ferrite core and linear or tactile "Feel" key switches.

Other features include an electronic shift lock, flexible key assignment, multiple mode selection, positive or negative logic, autorepeat and serial and/or parallel output.

The keyboard is priced at $107 for orders of 100 or more, $85 for 1,000 or more and $60 to $70 for 10,000 or more. More information is available from the vendor at 400 W. Grand Ave., Elmhurst, Ill. 60126.

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Bits & Pieces

DLM V Line Monitor Offers Menu-Driven Programming

MONTGOMERYVILLE, Pa. — The Network Control Division of Digilog, Inc. has announced the DLM V line monitor.

The unit features menu-driven programming with an edit and update capability that permits modifications of finished programs without rewriting. Other features include menu-guided setup, multiple stored setups, menu-guided programming, nonvolatile menu buffers, nonvolatile program buffer, program editing, full keyboard and a detachable keyboard, the vendor said.

The DLM V costs $5,395 and is available from 1370 Welsh Road, Montgomeryville, Pa. 18936.

Interface Product Family Fits Most Micro Controllers

EVERETT, Wash. — Micro-Mation, Inc. has released a family of computer interface products for most microcomputer controllers.

The SBC6803 Serial Coupler series is a microprocessor controller board designed to be used as a remote data acquisition and control unit, according to the vendor. It includes one serial port for communications with a host controller and two parallel I/O ports. The serial port can reportedly be set for rates of 150 to 9,600 bit/sec., and a plug-on interface adapter is used to interface to RS-232, RS-422 or fiber-optic communications links.

The coupler is available for $140, and adapters range from $40 to $65 from at 2615 W. Casino Road, Bldg. 3-D, Everett, Wash. 98204.

DG Cuts Prices 2% to 39% On Magnetic Storage Line

MILFORD, Mass. — Data General Corp. has announced price cuts between 2% and 39% on its line of magnetic storage media, including disk packs, cartridges, diskettes and tapes.

At the same time, prices on most DG ribbons for hard-copy peripherals have changed, with some increasing 6% to 20%, and others decreasing 5% to 21%.

In addition to the price changes, DG announced a one-time incentive offer of a 10% discount on any single computer supply item ordered from the company's catalog before May 15.

Price changes are effective immediately, the vendor said from 50 Maple St., Milford, Mass. 01757.

HP Enhances 7580A, 7585A, Adds Eavesdrop Capability

PALO ALTO, Calif. — The large-format Hewlett-Packard Co. HP 7580A and 7585A eight-pen drafting plotters have reportedly been enhanced to handle different sizes of paper.

In addition, the vendor has added two RS-232C/CCITT V.24 interface connectors to these products, providing them with "eavesdrop" capability.

At prices of $16,100 and $22,900, the HP 7580B and HP 7585B will replace the A versions, with shipments scheduled to begin next month. Futher details may be obtained from HP at 3000 Hanover St., Palo Alto, Calif. 94304.

CGIS' Tegastation Targets Printed Circuit Designers

AUSTIN, Texas — CGIS Co. has announced the Tegastation, an intelligent workstation for integrated circuit and printed circuit designers.

The unit features design capture, simulation and analysis software, interactive design and simulation. The stand-alone workstation is based on the 32-bit architecture of Apollo Computer, Inc.'s Domain local-area network, the vendor said.

Software for the workstation includes CGIS' Tegas simulation software, including a logic capture, simulation and waveform display modules, the firm said.

The base price for a turnkey version of the intelligent workstation is $60,000. The vendor also offers a software-only package for $39,000. The vendor is located at 7701 N. Lamar, Austin, Texas 78752.

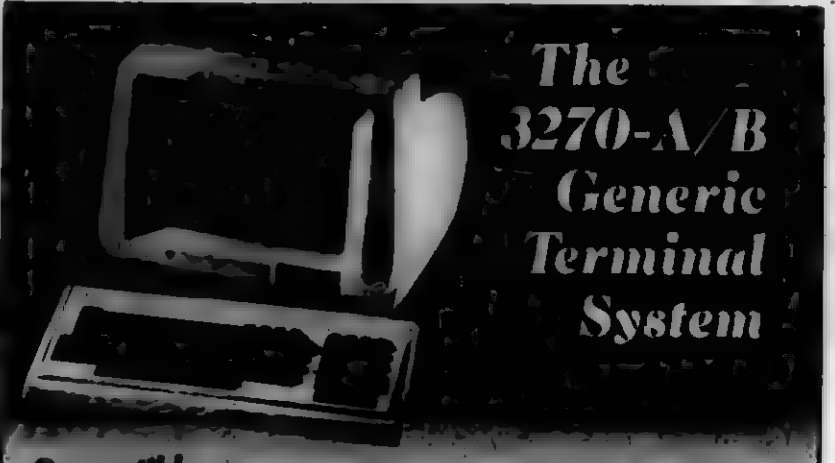
Applied Micro Announces IEEE 488 Link for STD Bus

TUCSON, Ariz. — Applied Micro Technology Inc. has announced an IEEE 488 interface for its line of STD Bus microsystems.

Designated ST4311, the interface is reportedly compatible with most processor standards for the bus. The board provides the user with the option of communicating with the General Purpose Interface Bus (GPIB) under either programmed I/O, interrupts or direct memory access control, according to a vendor spokesman. Visual indication of the state of the GPIB control and status lines is provided by an on-board LED array.

The price of the ST4311 is $350. Included with each ST4311 is a Digital Research Corp. CP/M compatible 5-in. or 8-in. diskette, technical manual and interface cable.

More information is available from Applied Micro, through Box 3042, Tucson, Ariz. 85702.



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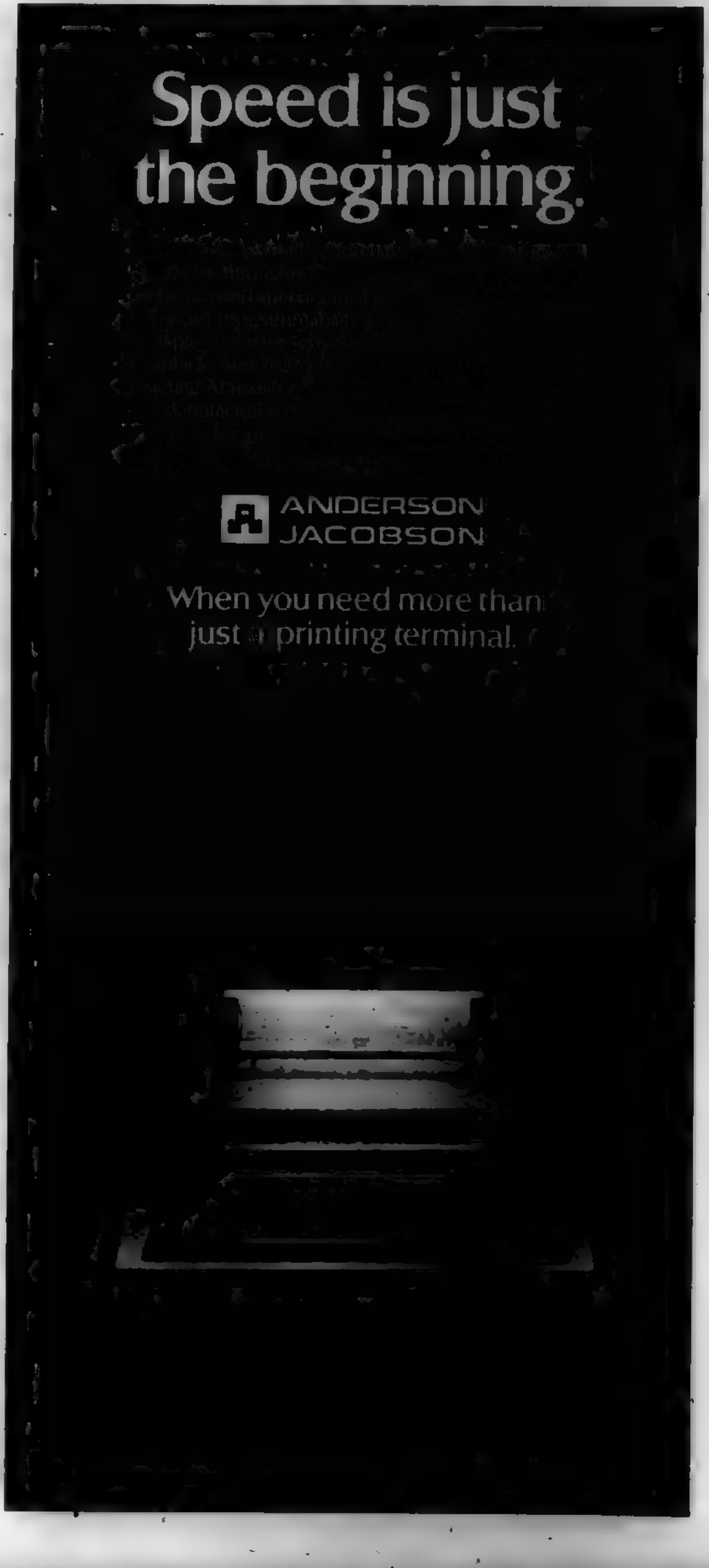
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Wedlock of Micros and E-Mail Predicted

By Marguerite Zientara
CW Staff

NORWALK, Conn. — The coming decade will likely bring the marriage of personal computers with communications technology, producing the healthy offspring of electronic mail.

Electronic mail systems have grown slowly in today's tough economic climate because of the high cost of terminals, according to a report from International Resource Development, Inc. (IRD).

"This is particularly true of computer-based message systems which [are] more advanced than telex for sending messages, but [have] had to face the problem of a lack of user base," according to the 234-page "Electronic Mail and Personal Computers."

However, personal computers generally procured for noncommunications reasons — word processing, games or education — "are likely to provide an unanticipated, but ideal, solution to the problem," the report projected.

Communications capabilities can be added to a personal computer today for as low as $150 on many systems, including hardware and software, and that price is expected to drop, the report pointed out. By 1992, there are expected to be 117 million installed personal computers, 60 million of which are expected to have communications capabilities.

> *'Personal computer-generated electronic mail is expected to jump from $48 million to $12.1 billion, increasing its share from 3% to 80%.'*

Also by that time, microcomputers are projected to have penetrated 70 million homes or approximately 70% of U.S. households.

All told, this will comprise "an enormous base of potential terminals, freeing communications service companies to develop sophisticated services for this base," the report noted. "With the problem of communications terminals solved, personal computer-driven electronic mail is likely to flourish."

Personal computers now send $48 million worth of electronic mail, which is only 3% of the total $1.45 billion market. The overall electronic mail market is projected to grow from $1.45 billion in 1983 to $15.1 billion in 1992.

Personal computer-generated electronic mail is expected to jump from $48 million to $12.1 billion, according to the report, increasing its share from 3% to 80%. "The personal computer electronic mail market will no longer be an afterthought and will become the major means of sending electronic mail," the report forecast.

Where will the networks come from to handle all this personal computer-generated electronic mail? As IRD's report pointed out, today's electronic mail supplier structure comprises a small number of large companies — Western Union, Inc.; RCA Global Communications, Inc.; ITT World Communications; and Western Union International — and a number of interconnection and home time-sharing firms, such as The Source and Compuserve.

Since these companies do not have the resources to implement networks large enough to handle the potential personal computer-generated electronic mail traf-

(Continued on Page 98)

Produces Letter-Quality Text

Model 630W Printer Fits Wang

BEDFORD, Mass. — Continental Resources, Inc. has introduced a letter-quality printer for use with equipment from Wang Laboratories, Inc.

The Model 630W uses the Xerox Corp. Diablo's print mechanism and enclosure to replace Wang's 6581W printer. Features include 40 char./sec bidirectional print speeds with a plastic print wheel and 32 char./sec print speeds with a metalized wheel. Cut-sheet feeders and continous-form tractor feeds are available as options.

The printer is available for $4,800 from Continental Resources, Inc., 175 Middlesex Tnpk., Bedford, Mass. 01730.

CT-Mail Package Processes Messages At ISW, ASW Lines

SANTA CLARA, Calif. — Convergent Technologies, Inc. has introduced an electronic mail package said to process messages locally at the vendor's IWS and ASW families of workstations.

CT-Mail takes advantage of a cluster architecture allowing a user to set up messages during regular business hours and have them transmitted at a later time, according to a vendor spokesman. It will allow messages and up to eight attachments per message to be sent between the 16 workstations.

Available in the spring, CT-Mail costs $3,500.

Additional information is available from Convergent Technologies, 2500 Augustine Drive, Santa Clara, Calif. 95051.

Document Retrieval Out for System/34

WINTER PARK, Fla. — Westmoreland Systems, Inc. has announced the Document Retrieval System for the IBM System/34.

The system is keyword-based, a spokesman said. When a document is filed on the system, it is given a number representating the physical location of the document and up to five keywords.

The Document Retrieval System costs $300 from Westmoreland Systems at Suite I, 228 Park Ave. N., Winter Park, Fla. 32789.

Slide Maker Fits IBM Micro

DALLAS — Computer-Mate, Inc. has introduced a slide maker for the IBM Personal Computer said to produce presentation-quality 35mm slides or photographic prints directly from the computer's display.

The Video Printer features automatic film advance and rewind and a port for previewing the screen image to be captured. Controls allow the user to adjust chroma, brightness, contrast and raster without loss of resolution.

The unit is available for $2,495 from selected retail outlets or from Computer-Mate, Inc., 1006 Hampshire Lane, Richardson, Texas 75080.

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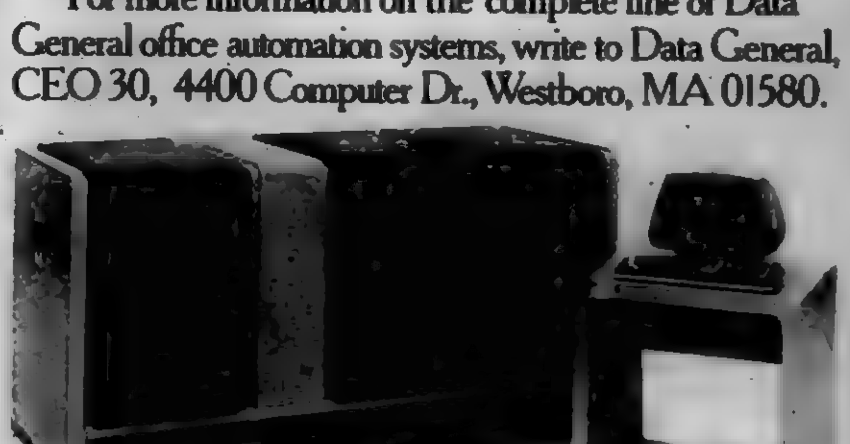


Data General

'Compuphobia' Seen Hitting Older Work Force

NORWALK, Conn. — The expected proliferation of personal computers in the work place will not be a bed of roses for everybody. A quarter of the work force will have psychological problems stemming from fear of computers, according to an International Resource Development, Inc. (IRD) researcher.

"Compuphobia" will have its most severe effect on older members of the work force, according to David Ledecky. "Workers who have done their jobs without computers for 10 or 15 years and who haven't had exposure to them in universities or educational settings will obviously have the toughest time adjusting," Ledecky said.

"Businesses take cost factors into account in the implementation of computers, but often overlook the fact that certain employees simply don't adjust well to working and communicating with computers," he observed.

"A great deal of this compuphobia can be related to math anxiety and to difficulties that individuals encounter in learning foreign languages," he noted. "There are elements of both in the use of computers."

There are three distinct forms of the affliction, according to Ledecky. The first is the general fear of working with computers.

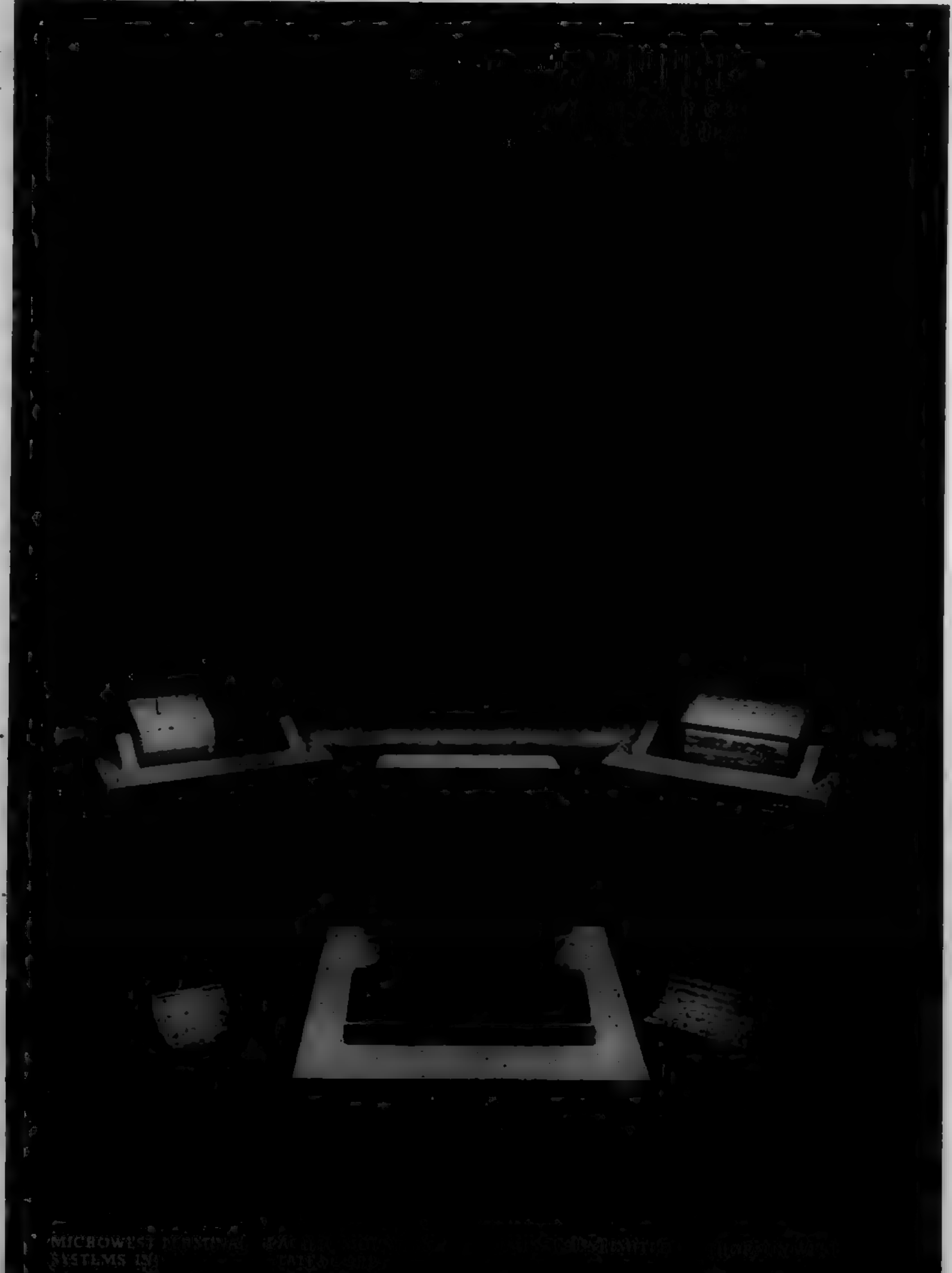
A second, closely related form of compuphobia is the fear of failure in computer usage. This fear is similar to the fear of performance failure on any job-related task, except that in working with computers, people feel they have less control over their work and fewer means of checking and validating their performance.

The third form of compuphobia relates to the fear of being replaced by a machine, Ledecky said. Individuals feel they are working with an instrument that might actually undermine their own value in the work place.

Ledecky stressed that while manifestations of compuphobia are not expected to drive many individuals to seek professional help, "hesitancy over working with computers will handicap a certain percentage of employees."

Time, however, heals all wounds, and these difficulties "should dissipate with time and with greater exposure to the computers," he concluded. Furthermore, the growing use of microcomputers to transmit electronic mail both at home and at work may help increase user comfort levels.

Ledecky drew his conclusions from informal discussions with people who have implemented computers in business.



Micros, E-Mail Intricately Tied

(Continued from Page 95)

fic, the electronic mail services field will be a "wide open area to new entrepreneurs during the next few years," the report said.

On the other hand, "it is a business that ultimately must be championed by large organizations such as AT&T and IBM for the required handling capacity to be developed to service the potential users," the report claimed.

The "most spectacular development" of the technology "could well be the emergence of computer conferencing," which IRD called "a misunderstood tool used primarily by academic institutions and a few leading-edge businesses."

IRD's report is available for $985 from 30 High St., Norwalk, Conn. 06851.

'Memoplan' Fits 8-, 16-Bit CP/M

SAN JOSE, Calif. — Chang Laboratories, Inc. has announced Memoplan, a word processing package for users of either 8- or 16-bit versions of Digital Research, Inc.'s CP/M operating system.

With the package, up to five documents can be produced at the same time. A split-screen feature of the software makes it possible to work on two documents simultaneously.

The package was designed for use by an executive or secretary who might have limited experience with word processing, the vendor said. The package requires a minimum of 64K bytes of random-access memory and two floppy disk drives with a minimum capacity of 150K bytes each.

The package costs $195. The vendor is located at 5300 Stevens Creek Blvd., San Jose, Calif. 95129.

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WP Package Out for System/34

KIRKSVILLE, Mo. — Mako Consulting has introduced a word processing package for the IBM System/34 said to feature spelling assistance, help key instructions and full-screen data entry with word wraparound.

The Mako-Text package also features right justified margin, move, insert, delete, mass letter printing with address insertion from an address file and utility menu items, including copy file and delete file. The text editor requires 24K bytes of memory and is written in RPG-II, the vendor said.

The package is available for $250 from Mako Consulting, P.O. Box 698, Kirksville, Mo. 63501.

Call Accounting System Studies Phone Usage Costs

LEXINGTON, Mass. — NEC Information Systems, Inc. has announced a telephone call accounting system said to interface with virtually any telephone private branch exchange system to analyze phone usage costs.

Astra-Phacs comprises three major functions, including station message detail reporting, traffic management reporting and an attendant directory and message center.

The system runs on Models 230, 250 and 270 of the firm's Astra series of computers and costs $3,000 from NEC Information Systems at 5 Militia Drive, Lexington, Mass. 02173.

Spec Library Introduced

NEW YORK — Bowne Information Systems, Inc. has introduced a master guide specification library available on floppy disks and operable on the IBM Displaywriter word processor.

Spectext On Display writer is aimed at medium-size construction projects with provisions for expansion to larger projects, multiple contract work and construction management work.

The package is available for $2,200 from Bowne Information Systems, 435 Hudson St., New York, N.Y. 10014.

Wang OIS WP System Gets 3270-Emulation Software Aid

CHICAGO — Harris Trust and Savings Bank has introduced an IBM 3270-emulation software package for the Wang Laboratories, Inc. OIS word processing system.

The package is said to enhance the use of Wang's 3270-emulation software by making it possible to convert print spool files into word processing documents. It is written in OIS-Basic and is said to make the conversion in one step without additional formatting or editing.

The package is available for a one-time license fee of $750 from Harris Trust and Savings Bank, located at 111 W. Monroe St., Chicago, Ill. 60603.

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Bought by Dun & Bradstreet

McCormack & Dodge Corp. Is Acquired

By Lois Paul
CW Staff

NEEDHAM HEIGHTS, Mass. — McCormack & Dodge Corp. was acquired last week by Dun & Bradstreet Corp., according to the chairman of its board of directors, James M. McCormack.

Under the terms of the agreement, the owners of the privately held firm will receive $50 million up front. Beyond that, they will garner royalties based on a percentage of revenue growth over the next three years, as well as a percentage of profits over that period, McCormack reported.

McCormack & Dodge, a developer of financial and accounting software packages, was founded in 1969 by McCormack and Frank Dodge, the firm's president. Sales of McCormack & Dodge's products have grown from $90,000 in 1970 to $38.5 million at the end of 1982.

A major motivation for the move, according to McCormack, was the need for research and development funds to support the firm's recently announced Advanced Financial Systems (AFS) methodology. This is a design methodology for developing on-line, real-time functions for existing and new applications that is based on the use of reusable code [CW, Jan. 24, 1983]. When it was announced, John Landry, vice-president of research and development for the firm, told *Computerworld*, "We will probably replace, functionally, all the on-line facilities we currently have on the system. We will be releasing Fixed Assets, General Ledger, Accounts Payable, Purchasing, Payroll and Personnel — all on-line functions under the control of AFS." "We have the new technology, AFS, and to maintain the growth rate as well as to introduce and enhance that technology successfully, we feel that we need to do a lot of investing in the next couple of years," McCormack said.

The basic choice for the firm was either to go public or to be acquired. "When we considered the going-public option, we thought that being a public company would basically frustrate some of our ob-

(Continued on Page 104)

IBM Charges Ex-Employees, Firm With Stealing Formula

By Tom Henkel
CW Staff

SAN FRANCISCO — IBM has charged five former employees, their recently formed company and the venture capitalists backing the firm with stealing IBM's secret formula for developing thin-film read/write heads for disk drives.

In the second such action taken against former employees in the past six months, IBM filed suit March 16 in U.S. District Court here charging Cybernex Corp. of San Jose, Calif., five of the firm's top executives and two investment divisions of the Pittsburgh, Pa.-based Hillman Co. with misappropriating confidential IBM information.

The suit claims Cybernex has infringed on IBM's patents on the thin-film head

(Continued on Page 104)

Seeks Presidential Commission

HP CEO Urges U.S. Tech Plan

By Robert Batt
CW West Coast Bureau

PALO ALTO, Calif. — The president and chief executive officer of Hewlett-Packard Co. has called for the establishment of a presidential commission designed to devise a strategy for the U.S. computer and electronics industry.

In a recent interview here, John A. Young said the purpose of the commission would be to foster debate and develop important issues to a level where some effective action could be taken to counter international competition, particularly from the Japanese.

"The time is right for us to adopt a strategy. There has been a ground swell of concern about our international competitiveness, and I think a presidential commission is one of the most effective things that could be done to provide a coherent set of recommendations that could serve as an underpinning to the policy changes that are needed," Young asserted.

(Continued on Page 108)

John A. Young

Japanese Refute Charges by U.S.

By Jake Kirchner
CW Washington Bureau

Representatives of the Japanese electronics industry have strongly refuted what they termed "biased and distorted" charges by American semiconductor firms claiming they have been harmed by Japanese government programs to foster native high-technology industries.

In a strongly worded statement issued from Tokyo, the Electronic Industries Association of Japan (EIA-J) countered the claims of a U.S. Semiconductor Industry Association (SIA) report released last month in Washington, D.C., that claimed

(Continued on Page 102)

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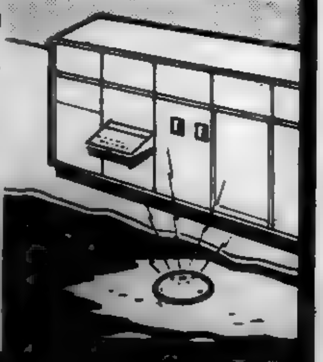


Japanese Industry Refutes Charges From U.S. Firms

(Continued from Page 101)

the Japanese have unfairly, and in some cases illegally, sought to protect their own semiconductor companies and give them a competitive advantage at home and in the U.S. [CW, Feb. 14].

The Japanese association said in its March 10 statement that the SIA report "is crowded with hyperbole, factual misrepresentations and pettifogging detail." The SIA document, the EIA-J said, reflects "the paranoia involved in the rising crescendo of defamatory criticism singling out Japanese industrial policy.

> *'. . .the United States successfully achieved its pinnacle in national industrial and technological development by resorting to a pervasive system of tariffs and government intervention and subvention to protect and promote basic industries.'*

Commenting on the harsh language in the EIA-J statement, Mike Tsukamoto, a New York representative of the Japanese electronics industry, said the statement reflects the "frustration" of Japanese firms, which feel they are unjustly attacked by American companies for their competitive success. Tsukamoto suggested both countries should stop arguing and find more ways to cooperate.

The EIA-J statement said the U.S. semiconductor industry has benefitted from goverment assistance — through government research and development funds and through military contracts — far more than its Japanese counterpart has from its government's action. In addition, the association said, Japanese industrial policy is different from those of other advanced nations, including the U.S, only in that it is more successful.

"As any American economic historian is aware, the United States successfully achieved its pinnacle in national industrial and technological development by resorting to a pervasive system of tariffs and government intervention and subvention to protect and promote basic industries," the EIA-J said.

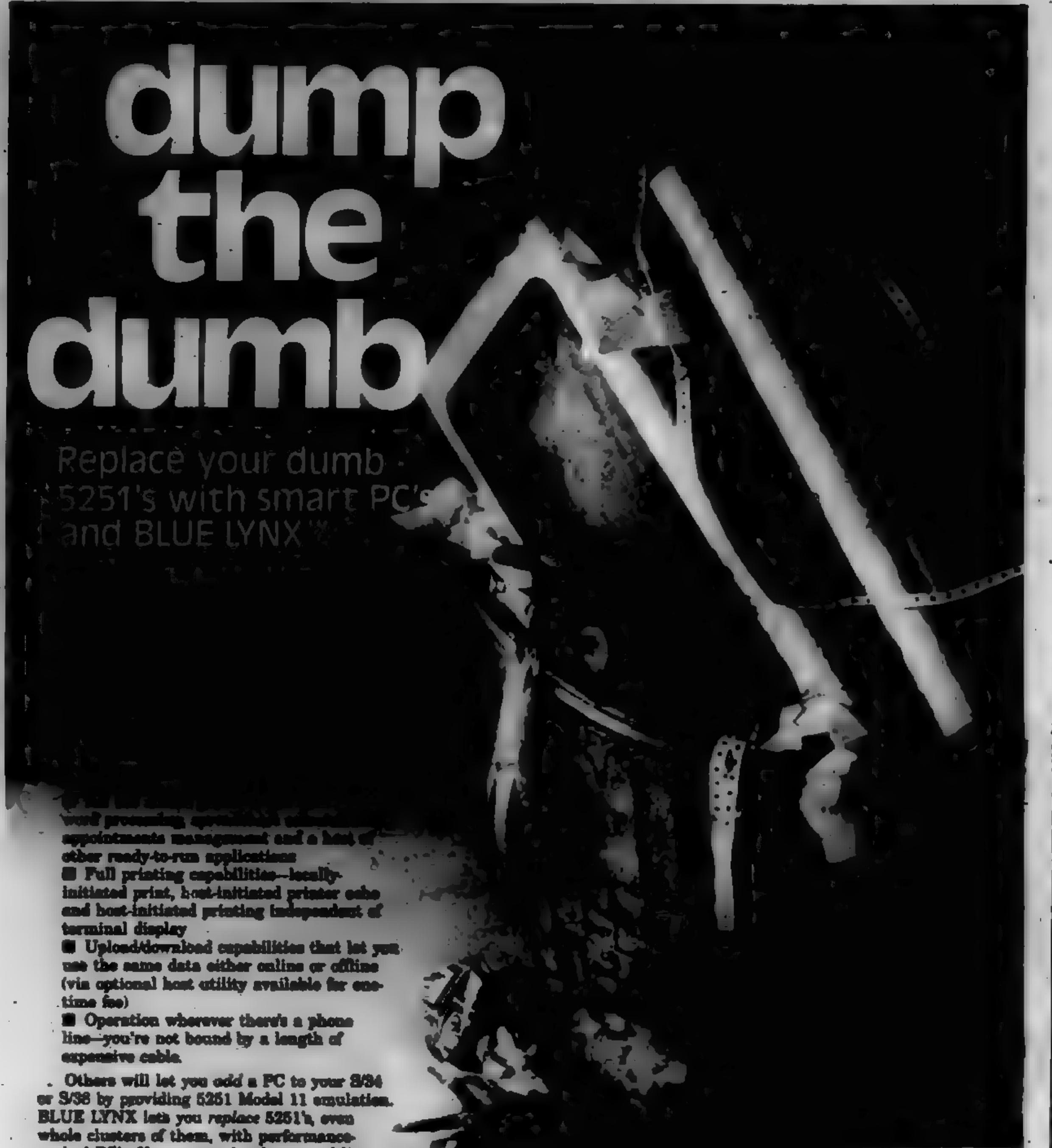
"Today, the much less intrusive industrial policy of Japan is under attack, we urge, not because of its structurally biased unfairness as alleged, but because Japan had the temerity to make it successful — as did the United States in promoting basic industries in part through government R&D and procurement subventions."

Adopting Similar Tactics?

The EIA-J argued that while American firms decry Japanese actions, they themselves are moving to adopt similar tactics, such as joint R&D cooperatives and joint government-industry projects. All nations have industrial policies, the EIA-J added, saying "such industrial policies are a proper and legitimate expression of national policy and serve the economic and national security needs of the governments involved.

"Lashing out at what he termed the U.S. "strategy for high technology," Toshio Takai, EIA-J executive vice-president, said Americans perceive high technology as "the only remaining area where the U.S. can still compete internationally. Therefore, it is both 'sanctuary' and 'glory' reserved for American industry, and maintaining eternal superiority over other nations is the sacred duty of the Americans."

The U.S. will do anything it can to "undermine the potential ability of foreign countries" to challenge American high technology superiority, he said."



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Exec Sees IBM Aggressiveness Impacting PCMs

By Robert Batt
CW West Coast Bureau

MOUNTAIN VIEW, Calif. — IBM's increased market aggressiveness is forcing plug-compatible manufacturers to choose between focusing activities on service operations or adopting manufacturing strategies while relying on others to market their products.

This is the view of David Martin, president of National Advanced Systems, Inc. (NAS). A plug-compatible manafacturer that recently abandoned its mainframe manufacturing and development operations, NAS has chosen to focus its efforts on end-user marketing of IBM-compatible CPUs made by Japanese manufacturer Hitachi Ltd.

"It is my belief that there are two types of companies unfolding in the computer industry — those that focus on business operations such as sales, software support and leasing and those that are product-oriented, dealing with technology, system design, manufacturing and quality assurance," Martin said.

NAS had made the decision, he said, to focus totally on business operations, while Hitachi's role, at least as far as exports are concerned, is totally a product operation.

"There is a trend now emerging in the computer business that recognizes that to compete with IBM, you have got to acknowledge that you cannot invest in both these areas across a wide range of products and still get an acceptable return on your investment.

"What allowed us to make the decision we have made is the realization that customers do not want to invest in companies with a narrow field of mainframes. They want a broad-line supplier. What we are witnessing, therefore, is a business trend to deal with the fact that IBM is so massive in its revenues that no one company can go it alone and compete across-the-board on a long-term basis," he asserted.

Martin expects IBM to emphasize two paths within its market segment: continued rapid technological developments in mainframes and a greater penetration of markets that others have pioneered, such as networking, office automation, distributed processing and communications.

"Other companies will need to have very broad systems capabilities to compete and this will require massive investments," he explained.

Over the next five years, the chief executive predicted, the plug-compatible manufacturer field will be reduced to two or three very large broad-line product companies, leaving little or no room for the specialist. "We feel our relationship with Hitachi will be very influential in this process," Martin added.

However, Martin admitted there are risks involved, the chief of which is IBM's power to impact the business of its rivals by aggressive pricing decisions or technology developments.

"Since the [U.S.] Justice Department dropped its antitrust case against IBM, there is no question that the velocity of their business practices has increased," he said.

In such an IBM-dominated environment, user fear, uncertainty and doubt are big problems for NAS, he said. The bankruptcy filing of Magnuson Computer Systems, Inc. (CW, Mar. 14) has become a problem for NAS, he said, because users are concerned about who will be in trouble next.

"Any piece of news that has any negative element associated with the [plug-compatible manufacturers] gets exploded in the mind of the user by IBM," he maintained. "IBM is the standard, so large that, within limits, it can do what it wants, and anyone else compared to it is immediately seen as deficient."

Dyer Resigns From STSC Post

ROCKVILLE, Md. — Daniel Dyer, president and chief executive officer of STSC, Inc., has resigned from his post, effective May 31. Dyer has held the position since he founded the computer time-sharing and software firm in 1969.

STSC, which developed APL and a host of related software products, suffered a loss of $1.8 million in the fiscal year that ended May 31, 1982. The company was acquired by Continental Telecom, Inc. last August.

Dyer will continue to serve as a consultant, a spokeswoman said. He has no immediate business plans.

UIS, Intercomp Unveil Joint Marketing Plan

KANSAS CITY, Mo. — United Information Service, Inc. (UIS) and Intercomp Resource Development and Engineering, Inc. have announced the renewal of a joint marketing agreement that provides computer services to computer users in the petroleum industry.

Intercomp is a major developer of reservoir and pipeline simulation software products. Under the agreement, Intercomp's energy recovery products are offered on a remote computing basis through UIS computer services.

The UIS system operates via local telephone lines and UIS' data communications network.

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Dun & Bradstreet Buys McCormack & Dodge

(Continued from Page 101)

jectives. If you are going to go for big growth, it is hard to get a healthy bottom line because you are going to be investing all the time. Yet, if you are public and those closing numbers don't look good, your stock will take a beating," he explained.

Deciding that acquisition was the route to go, the firm discussed this approach with seven companies. "Our phone just kept ringing and people kept saying 'we are interested in your company.' Dun & Bradstreet was one of those."

He said his company liked Dun & Bradstreet, partly because "we feel as though they like our plan. They are intending to leave us reasonably autonomous to pursue the plan, but provide whatever else they can in the form of resources to help us assure that we make it."

The same product line will be continued, McCormack asserted, but the firm also will be able to move that product line toward the microcomputer world much faster with communications-linkage software between micros and mainframes. "Via the AFS technology, we will be able to distribute our products functionally to micros," he said, adding that the firm also will be able to introduce new products more quickly and to acquire products more readily.

The firm rounded out its line of accounting software by acquiring the Human Resources Information System division of Dyatron Corp. of Birmingham, Ala., last year, thereby gaining rights to market and maintain Dyatron's Human Resource Information software package.

McCormack & Dodge will have the same management, same titles, same offices and same location but a different reporting structure, according to McCormack. Instead of reporting to its board of directors, the firm will report to David Fehr, president of National CSS, Inc., another Dun & Bradstreet subsidiary. In turn, Fehr will report to Bob Weissman, executive vice-president of Dun & Bradstreet.

IBM Charges Ex-Employees, Firm With Secrets Theft

(Continued from Page 101)

manufacturing process. In addition, Cybernex President William A. Klein, Senior Vice-President Robert D. Hempstead, Senior Vice-President Ning-Gau Wu, Vice-President of Engineering Surendra Gupta and Vice-President of Administration John A. Dellos, all former IBM employees, were accused of breach of contract and fiduciary obligations, IBM said.

The venture capitalists, HCC Investments, Inc. and CRF Investments, Inc., both of Wilmington, Del., IBM claimed, joined Cybernex to engage in unfair competition with IBM and, therefore, are also wrongfully using IBM trade secrets. The IBM suit went on to name two employees of the Hillman Co., Stephen J. Banks and Stephen N. Hutchinson, as defendants. The two men serve on the board of directors of Cybernex.

IBM claimed it has spent $200 million and more than 14 years to develop and manufacture the thin-film read/write heads currently used in the firm's 3370, 3375 and 3380 disk drives. Cybernex, IBM charged, managed to develop almost the identical process several months after the firm opened for business in October 1981.

But Cybernex President Klein claimed Cybernex developed its manufacturing process based on information in the public domain, namely technical papers and patent documents. Furthermore, Klein contended that since it opened for business in 1981, Cybernex has kept IBM informed of details of its business plans. In fact, Klein said, IBM representatives have toured the Cybernex facilities.

"They [IBM] appear to be claiming the entire process of making thin-film heads belongs to IBM," Klein said, noting that other firms, such as Memorex Corp. and Storage Technology Corp. also have thin-film head projects.

Mark Laskow, general counsel for the Hillman Co., said HCC and CRF Investments both investigated Cybernex before deciding to provide venture capital. Laskow said Hillman's stance is that Cybernex has done nothing wrong and IBM is attempting to restrict competition.

IBM is asking unspecified damages and has asked the court for an injunction enjoining Cybernex from using or disclosing IBM trade secrets or proprietary information. A hearing date has not been set.

The Cybernex case marks the second time in the past six months that IBM has filed suit against its former employees for allegedly stealing trade secrets. In September, IBM fired and charged the three top executives of Bridge Technology, Inc. with allegedly stealing secrets involving IBM's Personal Computer. IBM won that case, which resulted in court injunctions against two of the three employees.

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IDC Exec Says IBM Micros May Surpass Those of Apple

By Patricia Keefe
CW Staff

FRAMINGHAM, Mass. — IBM Personal Computers may surpass those of Apple Computer, Inc. by the second quarter of this year.

So speculated Aaron Goldberg, International Data Corp. (IDC) senior research manager, small systems, while speaking at IDC's annual industry briefing session held here recently. He also suggested that industry watchers might expect to see some "big names" dropping out of the micro market in the future.

The personal computer market in general represents the end of what Goldberg called the first epoch in the information age. The most visible manifestation of this epoch is the "death of the one-size-fits-all micro," such as the Apple II, which was the same in the home as it was in the work place and in the laboratory, he said.

Now, the micro market is divided into three areas: 8-bit home computers selling for as low as $100; 8- and 16-bit general business systems with 64K- to 512K bytes of memory and priced from $1,500 to $7,000; and sophisticated systems, typically 16-bit with 256K bytes of memory and priced from $8,500, Goldberg said.

Visicorp's Visicalc has ignited the business market in much the same way that lower prices have helped escalate home sales, Goldberg said. Alluding to the success of the IBM Personal Computer, Goldberg asked, "Enter IBM, exit who?" He noted that there is much speculation in the business computing area as companies begin to go public. "Look for big names to drop out of the [micro] market," he said.

In a graph contrasting quarterly shipments of the IBM Personal Computer with all Apple products, Goldberg said it is "interesting that while IBM grows, Apple flattens." About the second quarter of 1983, if the trends continue, IBM might surpass Apple on a quarterly shipment rate, he added. "It will depend on what Apple does." Currently, according to IDC 1982 estimates, Apple leads in micro shipments with 33%, just over IBM's share of 26%.

"In the general business systems market, it is price that is remaining fairly constant, while functionality goes through the roof," Goldberg maintained.

Apple's recently announced Lisa business system is now the leading edge in sophisticated micros, Goldberg said, expecting IBM, among others, to enter that market, which he described as "not very big, but prestigious."

ITC Announces Study of Robotics, Seeks Written Submissions

WASHINGTON, D.C. — The International Trade Commission (ITC) has initiated a study of the domestic and international competitiveness of the U.S. robotics industry.

According to the ITC, the investigation will assess "capital, labor, technology and other economic factors affecting the manufacture and use of robotics in the U.S. and in foreign countries." Effects of the increasing application of robotics on the operations of domestic and foreign automobile, aircraft and appliance industries will also be explored.

The commission is seeking written submissions from the public. They will be treated as confidential, if requested.

Submissions should be received by August 12 by the Secretary, U.S. International Trade Commission, 701 E Street N.W., Washington, D.C. 20436.

Hughes, IBM Ink Satellite Ed. Plan

LOS ANGELES — Hughes Communications, Inc. has agreed to provide IBM's National Accounts Division (NAD) with a satellite education program.

Under the agreement, Hughes and its subsidiaries will provide NAD with satellite communications capabilities for a customer and employee education program. The NAD education centers will receive full-motion color video over satellite and will have an interactive audio response capability from the classroom to the instructor.

Video, associated voice and data transmission will be provided by Hughes Communications' Galaxy III satellite, which is scheduled to launch in September. Satellite access for three NAD television studios and several education centers will be from terrestrial microwave and earth stations under development by Hughes and related subsidiaries.

The Hughes service is said to be a custom 6/4 GHz system using single channel/carrier techniques for audio and is tailored to NAD education needs. IBM will continue to use and plans an expansion of Satellite Business Systems' 14/11 GHz network for voice and data applications across the corporation.

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Dow Jones Inks Pact With III

CULVER CITY, Calif. — Information International, Inc. (III) and Dow Jones and Co. have agreed to develop direct electronic computer-to-plate production of *The Wall Street Journal* and *Barron's National Business and Financial Weekly*.

The technology is intended to compose electronically and plate complete pages with all text, graphics and advertisements in an automated operation. Dow Jones will extend its proprietary laser platemakers and scanners to accept and transmit stored digital data and interface with the III equipment.

The contract provides an option for the purchase of additional systems by Dow Jones.

From Datastream

Rolm to Get 3270 Controller Savvy

SANTA CLARA, Calif. — Rolm Corp.'s Office Systems Division and Datastream Communications, Inc. have signed an exclusive agreement for Datastream to provide Rolm with IBM 3270 controller technology and products for use in gateways from the Rolm Computerized Branch Exchange (CBX) to the IBM environment.

Using the Datastream products in conjunction with its computer-controlled business communications system, the Rolm gateway will provide CBX users access to 3270 applications for most asynchronous Ascii devices such as terminals, personal computers and word processing. The capability can be accessed on a shared basis from local or remote locations, Rolm said.

The gateway emulates the 327X cluster controller using either 3270 Binary Synchronous Communications or Systems Network Architecture/Synchronous Data Link Control networks.

The companies will work together on future enhancements, they announced.

HP CEO Seeks Commission To Devise U.S. Tech Plan

(Continued from Page 101)

The commission, he said, would be in a position to assess the various options proposed by industry groups and associations. It could interact with congressional study groups that have already been established and would be an effective way of developing a national consensus.

"The United States needs to formulate a national response consistent with our own history and free market system. This means a careful examination of public policies to see how they affect America's high-technology industries and what changes would make us more competitive abroad. In this task, the commission could provide a real service and foster debate in such a way that we avoid turning this problem into a partisan political issue," he stated.

The commission's initital focus, he said, should be on education, because that is where the most urgent, short-term needs are to be found. Young pointed to a shortage of both students and qualified teachers in the computer science field.

Japan produces 2½ times as many engineers per capita as the U.S., while one-tenth of all engineering faculty positions in this country are unfilled. In alleviating this problem, private industry has an important role to play. HP recently committed $6 million to encourage 50 outstanding students to complete Ph.D. degrees, including a $50,000 equipment grant to the university where each candidate elects to teach.

Young also emphasized a need for more attention to manufacturing processing, saying this is an area where the U.S. has much to learn from the Japanese.

The key to Japanese industrial success, he asserted, has been the emphasis given to manufacturing low-cost, high-quality products. "It does very little good for us to develop highly sophisticated technical products if, within a relatively short time, another country can produce a more reliable and cheaper model," Young said.

He called for a greater emphasis in higher education institutions on manufacturing strategy and management and pointed to a $50 million support program from IBM as a step in the right direction. Under this program, IBM will provide cash grants and equipment to five universities, due to be selected within the next few months, for the purpose of teaching engineering design and manufacturing techniques.

Young warned that the cost of not taking effective action to meet the international challenge will be high. The success of the U.S. computer and electronics industries, he said, will be a determining factor in the vigor of the U.S. economy through the 1990s.

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Effect on Displaced Workers

Some Problems Seen With Rush to Automation

By Bohdan O. Szuprowicz
Special to CW‡

Analysis

"Automate or perish" seems to be the the battle cry of computer-aided design and manufacturing (CAD/CAM) proponents. Yet manufacturers are not rushing blindly to install masses of CAD/CAM systems and robots, connecting the same through highly touted local networks into the so-called "factory of tomorrow."

One important concern is the uncertainty of the effects of massive, simultaneous factory or office automation on labor that will be displaced. With some 30 million unemployed in the Western World, the problem has far-reaching implications.

Those who point to Japanese successes with robotics and the automated factory tend to forget the organized docility of Japanese labor and the social infrastructure of a nation whose people are almost exclusively Japanese. The educational system and resulting remarkable degree of discipline that can be imposed on the Japanese is almost impossible to duplicate elsewhere.

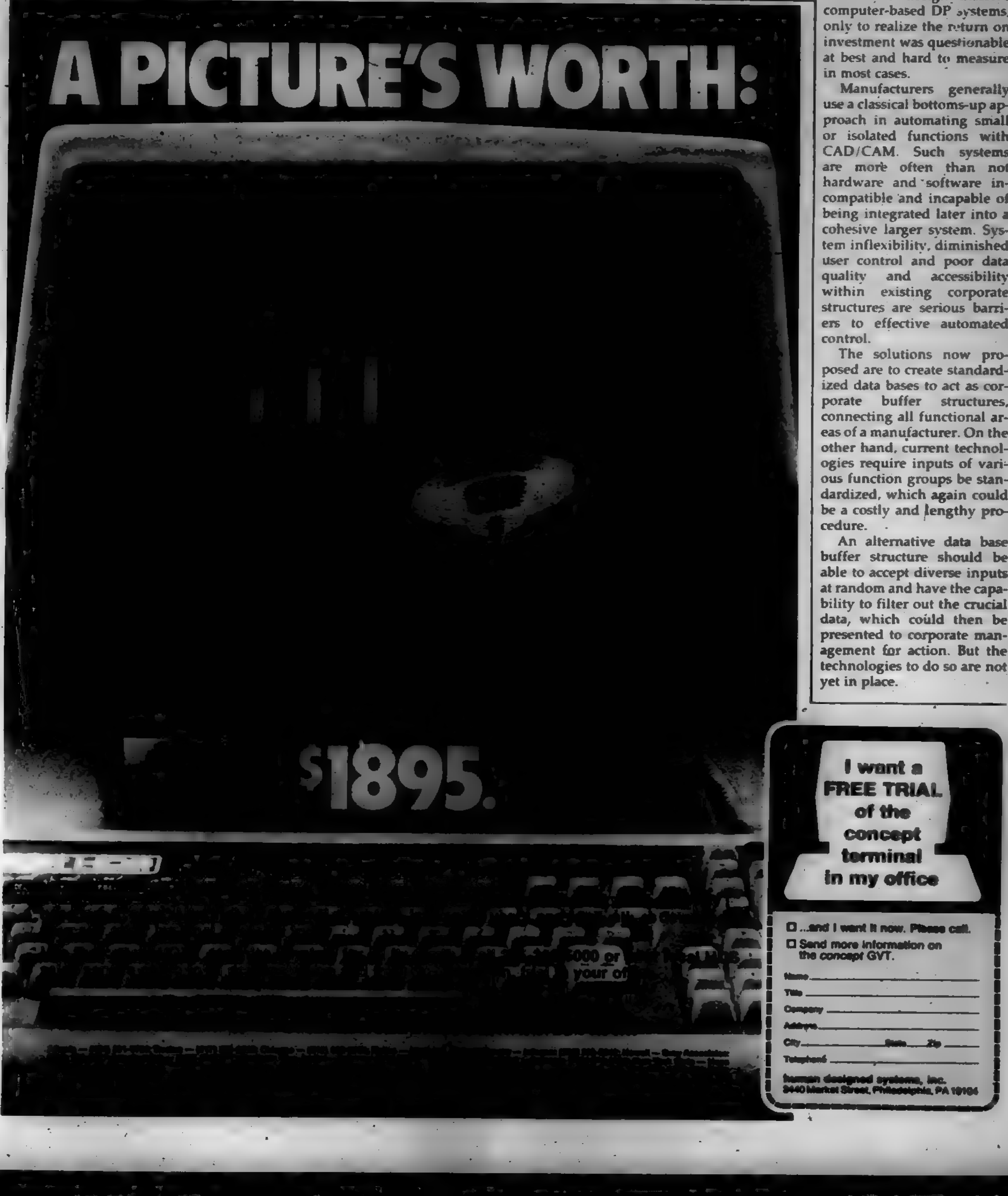
Also, the automation unemployment issue is beginning to catch the eye of politicians, who may soon be hard pressed to promote new legislature controlling the spread of automation or impose obligatory retraining programs on those manufacturers whose automation programs result in excessive displacement of workers.

During the last 20 years, many firms implemented a significant number of computer-aided solutions wherever they could be profitably used. In a number of instances, corporations went all out to design massive computer-based DP systems, only to realize the return on investment was questionable at best and hard to measure in most cases.

Manufacturers generally use a classical bottoms-up approach in automating small or isolated functions with CAD/CAM. Such systems are more often than not hardware and software incompatible and incapable of being integrated later into a cohesive larger system. System inflexibility, diminished user control and poor data quality and accessibility within existing corporate structures are serious barriers to effective automated control.

The solutions now proposed are to create standardized data bases to act as corporate buffer structures, connecting all functional areas of a manufacturer. On the other hand, current technologies require inputs of various function groups be standardized, which again could be a costly and lengthy procedure.

An alternative data base buffer structure should be able to accept diverse inputs at random and have the capability to filter out the crucial data, which could then be presented to corporate management for action. But the technologies to do so are not yet in place.



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Executive Corner

- **Don House** and **Dennis V. Vohs** have been named executive vice-presidents of Management Science America, Inc.
- **Russell F. Henke** has been appointed vice-president, mechanical engineering and manufacturing products, at Applicon, Inc.
- **Richard H. Kling** has been appointed vice-president, sales, and **James J. McKeef**, vice-president, marketing, at United States Satellite Systems, Inc.
- **H. Haagsma** has been promoted to the newly created position of vice-president, manufacturing operations, at Pertec Computer Corp.
- **Jack A. Bradley** has joined Bridge Communications, Inc. as vice-president and chief financial officer.
- **Bruce Smith** has been elected executive vice-president and chief operating officer of Software AG Systems Group, Inc.
- **Randolph Richmond** has been named president of ICL, Inc., the U.S. subsidiary of International Computer, Ltd., UK.
- **Philip C. Davy**, founder of Infoscribe, Inc. and president of the firm since 1979, has assumed the post of chairman of the board and chief executive officer. He has been succeeded by **David M. Connell**.
- **John E. Bertram** has been named president of IBM's General Products Division, succeeding **Arthur G. Anderson**, who was named to a newly created position in which he will review coordination between research and development activities.
- **Gary Arnold** has been promoted to vice-president and chief financial officer at National Semiconductor Corp.
- **Edward W. Carter** has been named senior vice-president of marketing for MCI Communications Corp.
- **David R. Mackie** has been appointed vice-president, U.S. marketing at Tandem Computers, Inc. following the resignation of **Charles W. Ryle**.
- **Jerry T. Ungerman** has been appointed vice-president and general manager of business operations at National Advanced Systems, a subsidiary of National Semiconductor Corp.
- **John Walsh** has joined The Braegen Corp. as vice-president and general manager of field engineering.
- **Marvin G. Kirby** has been appointed vice-president, domestic sales, at Prime Computer, Inc.
- **Charles Riddle** has joined Ross Systems, Inc. as vice-president of marketing.
- **Seth Hanover** has been promoted to senior vice-president; **Martin Aronow**, vice-president, Atlantic region; and **Paul Rosenthal**, vice-president, Pacific region, at Software Design Associates, Inc. **William Kirschner** has joined the company as vice-president of finance.
- **Eli Porat** has been appointed vice-president of operations for Sytek, Inc.
- **Paul W. Shields** has been promoted to vice-president, Pan American Operations, at Control Data Corp.
- **David R. Vincent** has been named vice-president of Boole & Babbage, Inc. He will continue as general manager of the Institute for Software Engineering, an independent division of Boole & Babbage.
- **Hatim A. Tyabji** has been promoted to vice-president, hardware products, for the computer systems operations of Sperry Univac.
- **Neal Dempsey** has been appointed vice-president of marketing for Zentec Corp.
- **Ron Grindstaff**, formerly of Intel Corp., has joined Envision Technology, Inc. as vice-president of operations.
- **Robert G. Chapman** has been elected an executive vice-president of the National Bank of North America.
- **Harry Colgate** has been appointed executive vice-president of North Atlantic Industries.
- **H.L. Sparks**, formerly director of retail sales for IBM's Personal Computer, has joined Compaq Computer Corp. as vice-president of sales and service.
- **Vincent L. Tofany** has been elected a corporate vice-president of Mohawk Data Sciences Corp. and appointed president of the company's Dek Identification Systems Division.
- **Les Briney** has joined International Digital Electronics Associates as vice-president for systems engineering.

Williams Named as President, Chairman of Board at Geisco

FAIRFIELD, Conn. — The General Electric Information Services Co. (Geisco) has named Walter W. Williams its president and chairman of the board. He will succeed Gregory J. Liemandt, who announced recently that he will leave the company this week.

Williams joined General Electric Co. 27 years ago and held various positions in the company's consumer electronics business before being named vice-president of the GE Housewares and Audio Business Division.

Liemandt, 39, will become chairman and chief executive officer of Wyly Corp. in Dallas. Liemandt cited Wyly's "independence" and an attractive offer as reasons for leaving Geisco. While at Geisco, Liemandt increased the firm's value-added services while acquiring several key software firms in recent months, including Software International Corp. and Lamda Technology, Inc.

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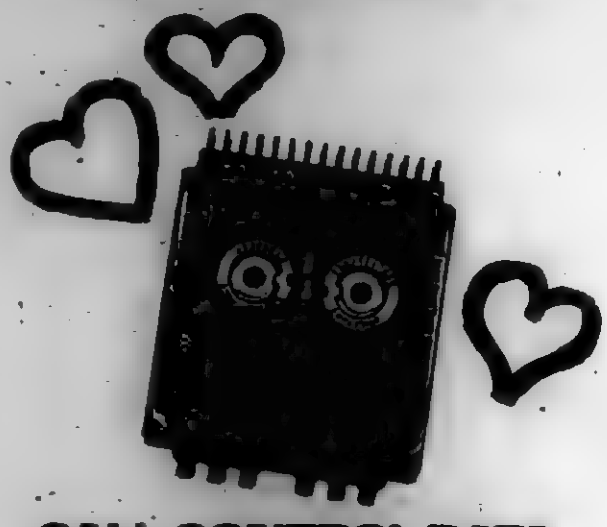

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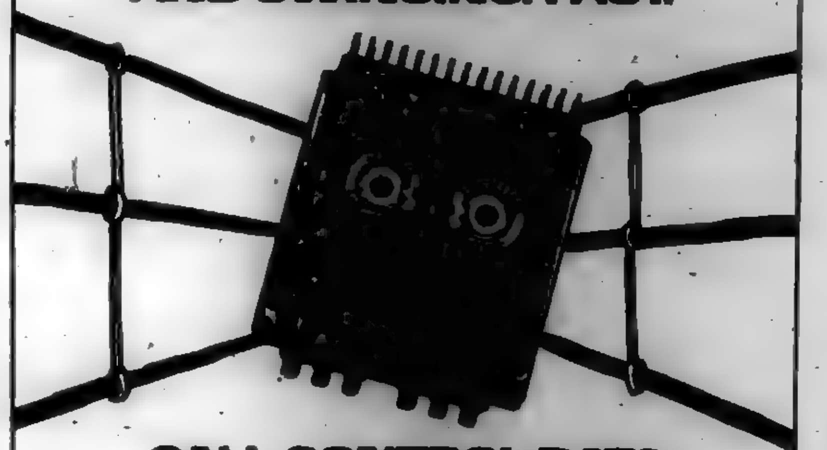

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At Colorado Operations

STC Lays Off 500 Workers

LOUISVILLE, Colo. — For the second time in six months, Storage Technology Corp. (STC) has announced major layoffs, this time affecting 500 employees in the company's Colorado operations. The layoffs are effective today.

STC dropped 400 people from its U.S. work force last November, the company's first major layoff in its 13-year history. At that time, Jesse Aweida, STC's chairman and founder, issued a pessimistic profit outlook for 1982, but added that the outlook for 1983 was rosier.

The most recent layoffs were spurred because the strong demand foreseen by Aweida for STC's data storage products has not materialized.

"During 1981 and early 1982, we significantly expanded many non-manufacturing operations in our Colorado work force because we anticipated continued strong demand for our disk data storage products . . . That demand has not continued and we find we must reduce our costs to keep them in line with the business that is available."

Aweida maintained that the second half of 1983 will see an upswing in STC's business, at which time the laid-off employees will be recalled.

Intel to Cancel Pay Cuts, Freezes

SANTA CLARA, Calif. — Spring thaws can happen in California too. That is good news for employees of Intel Corp., who learned last week that the firm will phase out pay cuts and pay freezes announced early this year.

According to Intel, half of the pay cut, which ranged up to 10%, will be restored starting April 1. If profitability continues to improve, the other half of the cut will be restored July 1, and merit increases will resume at that time, the company said.

Intel's apparent financial turnaround comes on the heels of a December announcement that IBM had purchased 12% of the microprocessor components and systems manufacturer. Under that agreement, IBM invested $250 million in Intel, reportedly to fund extensive research and development.

The IBM involvement had led industry watchers to believe Intel was on the verge of making big gains on the semiconductor market. In a recent report, Prudential-Bache Securities, Inc. noted that "Intel is the best-positioned company to participate in the very rapid growth we expect in the semiconductor industry over the next two or three years." It predicted that the semiconductor market will grow by 21% over the next five years.

Andrew S. Grove, Intel president and chief executive officer, credited Intel employees with cutting costs and increasing productivity.

Matsushita Caps Deal With IBM

ARMONK, N.Y. — Capping a February announcement of joint manufacturing talks [CW, Feb. 21], IBM has announced that Matsushita Electric Industrial Co. of Tokyo will manufacture a personal business computer developed by IBM to be sold only in Japan by IBM. It will be the first-ever IBM computer system made by another company.

Matsushita will make the 5550 Multistation, a Japanese-language word processor and personal computer. Based on the Intel Corp. 8086 microprocessor, the 5550 was developed in Japan by IBM's subsidiary there, IBM Japan Ltd.

Shipments of the 5550, which will sell for about $4,195, will begin in June.

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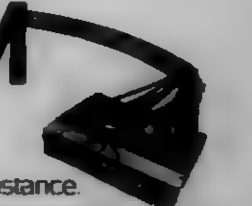

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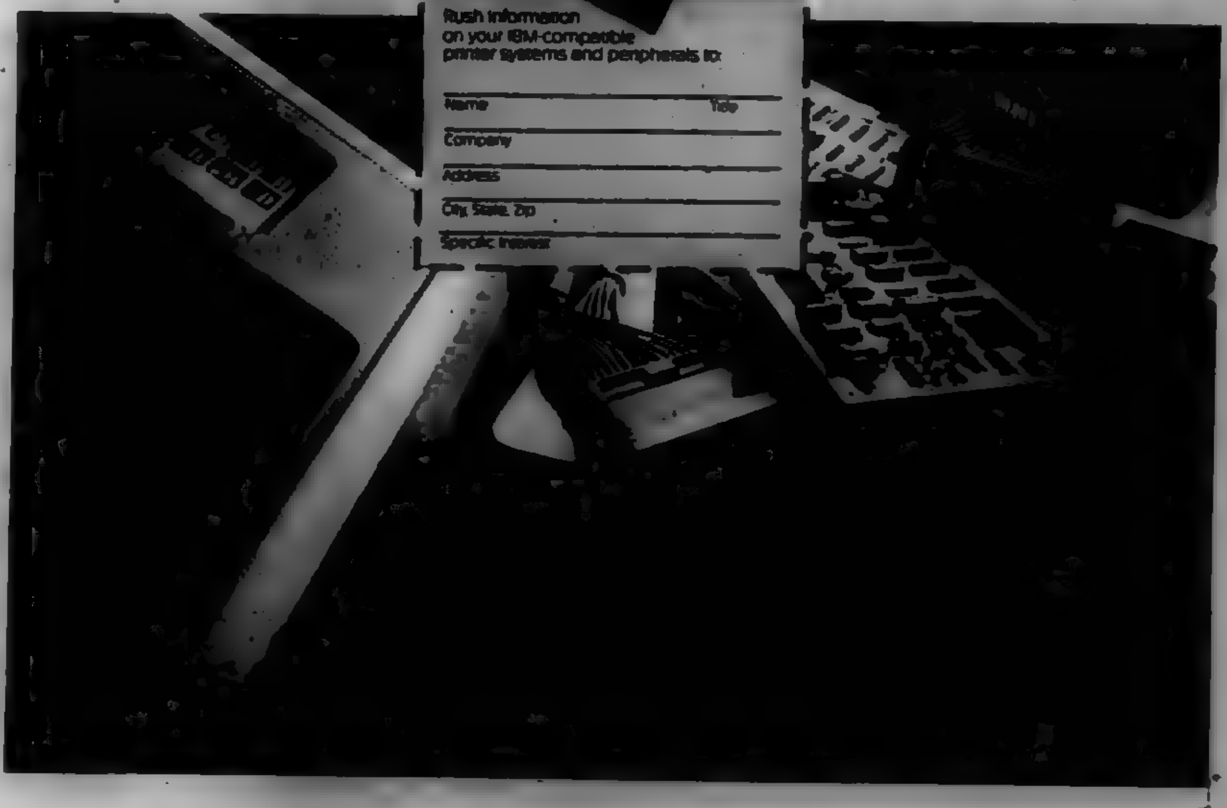

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Mergers & Acquisitions

Computer Products, Inc., Fort Lauderdale, Fla., has completed acquisition of **Compower Corp.**, San Jose, Calif. Compower will operate as an independent subsidiary of Computer Products and as a unit of the company's Power Products Group.

Micro Peripherals, Inc. (MPI) has acquired the floppy disk operations of **Information Magnetics Corp.**, a subsidiary of Computer & Communications Technology Corp., in exchange for an undisclosed amount of MPI common stock.

Banctec, Inc., Dallas, has reached an agreement in principle with **Input Business Machines, Inc. (IBMI)**, Frederick, Md., to acquire all shares of IBMI for 494,280 shares of Banctec stock.

Data Terminal Leasing, Inc. and **Compuleasing**, both of San Diego, have merged their assets and are now operating as **Data Terminal Leasing, Inc.** The firm has relocated to new facilities at 4805 Mercury St., San Diego, Calif.

Esprit Systems, Inc., Commack, N.Y., has completed the purchase of **Hazeltine Corp.'s** computer terminal equipment product line. Esprit Systems is a new company formed by an internal management group, Rosenkranz & Co, New York, and Oxford Partners, Stamford, Conn.

Applied Devices Corp., Palm Beach, Fla., has announced the sale of the company's Datatrol Business to **Addressograph Farrington, Inc.**, which will assume both Datatrol's $3.3 million industrial revenue bond and up to $4 million of debt to banks. Addressograph will also pay a 5% royalty on certain sales over a five-year period. For the fourth quarter of fiscal year 1982, the company reported sales from continuing operations of $6,444,000 and a net loss from continuing operations of $3,982,000, or 85 cents per share.

Pansophic Systems, Inc. has acquired **Software Generation Technology Corp.'s** SGT query and reporting system for CICS.

Honeywell, Inc. has purchased the stock of **Florida Communications Consultants, Inc.** of Miami, a firm that sells, installs and services business communications systems. The company will operate as a subsidiary of Honeywell under the name Honeywell-Florida Communications.

Logicon, Inc. has completed acquisition of **R&D Associates** of Marina Del Rey, Calif.

Atlantic Management Systems, Inc. and **International Systems, Inc.** have merged to form **AGS Management, Inc.** The new company, a wholly owned independent subsidiary of AGS Computers, Inc., will maintain dual headquarters at 890 Valley Forge Plaza, King of Prussia, Pa., and 320 Walnut St., Philadelphia, Pa.

United Technologies Corp. has acquired **American and Electronics Corp. (ACE)** of Gaithersberg, Md., for $4 million. The advanced systems engineering organization, which comprised 85% of ACE, has become a unit of United's Norden Systems. The remaining 15%, which provides commercial computer software for independent telephone companies, was sold back to a group of former ACE employees for $600,000. The group is operating as **American Computer and Electronics Corp. International.**

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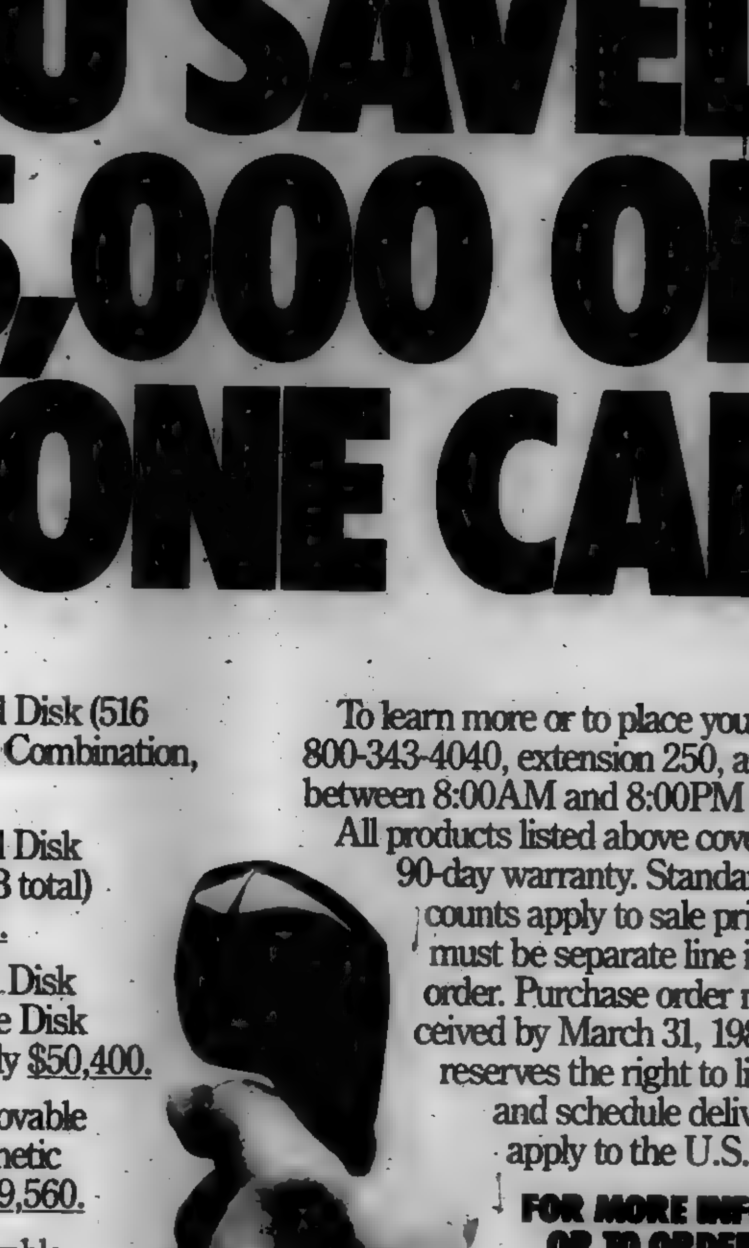

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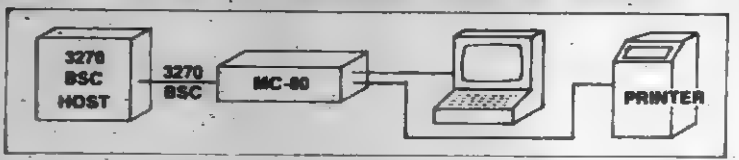

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Hitachi Targets Systems To Distributed DP Market

NEW YORK — Hitachi Ltd. has added to its M-series of mid-range computers with the unveiling of two systems aimed at the distributed data processing market.

The company claims the two systems, neither of which will be available immediately in the U.S., outperform the IBM 4341 and 4331 on a price/performance basis by an average of 35%.

The company also took the wraps off a compact magnetic tape unit that reportedly runs in either start/stop or streaming mode, a relational data base manager and a software development tool that is both Cobol- and PL/I-compatible.

Both systems and the tape unit will be available in Japan either this fall or early next year.

A 4341 Rival

Running under both the Virtual Storage Operating System 1/Extended System (VOS1/ES) and Virtual Machine System (VMS) operating systems, the internal processing speed of the M-220K is approximately 1.6 times that of the vendor's M-220H, Hitachi said.

The system, a competitor of the 4341, contains 2M bytes of main storage in its basic configuration and can be upgraded to 8M bytes. An M-220K holding 4M bytes of main storage, 2,540M bytes of fixed storage, two disk storage units, a 1,500 line/min line printer, five data terminals and three serial printers rents for $18,750/mo.

Competitor to the 4331

The M-220D, which is also compatible with the VOS1/ES and VMS operating systems, has approximately 70% of the M-220H's processing power and is the competitor of the 4331. The machine's basic configuration includes 1M byte of main storage, but is also upgradable to 8M bytes.

With 2M bytes of main storage, 300M bytes of removable disk storage, a 600 line/min line printer, two data terminals and a serial printer, it costs $7,500/mo to rent, according to the vendor.

Hitachi said it has no immediate plans to market the systems in the U.S.

The Relational Data Base Manager 1 (RDB1) stores and processes any data in the data base in table form, making data handling possible, according to a spokesman.

The Auto Documentation Aid System (Adcas/S) software development tool is Cobol- and PL/I-compatible and automatically generates documents for software maintenance and problem analysis.

Also expected to be available in Japan but not the U.S., the RDB1 will make its debut in September 1983, at a rental cost of $1,083/mo. The Adcas/S carries a monthly rental price of $146/mo and will be available in January 1984.

More on the two systems, magnetic tape drive and software development tool can be obtained from the vendor at 470 Madison Ave., New York, N.Y. 10027.

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Nickels & Dimes

Visual Technology, Inc. has recorded net earnings for the year ending Dec. 1, 1982 of $2,843,000, up 44% over 1981. Net earnings per share increased 24% to 78 cents, and sales for 1982 were $25,805,000, compared with $18,044,000 for 1981.

$ $ $

VLSI Technology, Inc. has completed an initial public offering of 4,400,000 shares of common stock at $13 per share through an underwriting group jointly managed by L.F. Rothschild, Unterberg, Towbin and Hambrecht and Quist, Inc.

$ $ $

Modular Computer Systems, Inc. has reported sales in 1982 of $92,770,000, compared with $87,200,000 for 1981. Net income totaled $1,790,000 or 34 cents per share, compared with $1,160,000 or 22 cents per share for 1981.

$ $ $

Analog Devices, Inc. has announced a three-for-two stock split in the form of a 50% stock dividend to be distributed on April 4, 1983 to stockholders on record as of March 18, 1983.

$ $ $

Computer & Communications Technology Corp. has reported that revenues for 1982 were $74,717,000, a 13% increase over 1981's $66,208,000. Fourth quarter revenues were $16,014,000, 13% below the 1981 fourth quarter. Net income for the year and fourth quarter was $5,103,000 and $168,000, a decline of 18% and 92%, respectively.

$ $ $

Science Management Corp. has announced net income for 1982 of $347,000 or 16 cents per share on sales of $46,466,000. Net income in 1981 was $1,266,000 or 62 cents per share with sales of $46,949,000. Earnings for 1982 were adversely affected by the start-up of a joint venture and unusual expenses related to stock appreciation rights, according to a company spokesman.

$ $ $

AGS Computers, Inc. has reported revenues of $65,026,000 for 1982, an increase of 68% over 1981. Net income increased by 38% to $2,484,000, and earnings per share rose from 57 cents to 73 cents.

Expansions

Hewlett-Packard Co. has moved its Pittsburgh, Pa. operations into a 37,000 sq-ft facility at 111 Zeta Drive, The new building is nearly four times larger than the firm's former Pittsburgh sales office.

Charlton Associates, Inc. has moved administration and manufacturing operations into a new 30,000 sq-ft building at 1 Marconi, Irvine, Calif.

Wang Laboratories, Inc. has broken ground for a 200,000 sq-ft manufacturing facility in Holyoke, Mass. Completion of the facility, which will also include warehouse and office space, is scheduled for fall 1983.

Telmos, Inc. has moved its corporate headquarters, marketing and manufacturing operations to a new 25,000 sq-ft facility at 740 Kifer Road, Sunnyvale, Calif. 94086.

Eaton Corp.'s Data Systems Services Division has opened its new headquarters at 5875 Green Valley Circle, Culver City, Calif.

New Companies

Ashland Automation Services, Inc. is a subsidiary of Ashland Services Co., a wholly owned subsidiary of Ashland Oil, Inc. The firm will offer a variety of computer and office systems as well as planning and technology services. Information can be obtained from Ashland Oil, through P.O. Box 391, Ashland, Ky. 41111.

Supersearch is a data base search service with emphasis on the federal sector. The company is a subsidiary of Chatham Group, Inc., which can be reached through P.O. Box 15181, Arlington, Va. 22215.

Pronto Computers, Inc. has been formed to design, manufacture and market business computers, peripherals and software. Corporate headquarters is at 3170 Kashiwa St., Torrance, Calif. 90505.

Shields Computer Services, Inc. is a company that provides software for banking applications, new and used computers, office supplies and software maintenance service. Franchises are available. The firm is located at Suite 330, 8080 E. Central, Wichita, Kansas 67206.

BSF Consultants is an office systems planning service offering consultation in office automation, word processing, telecommunications, personal computers and all office support services. It is located at 197 Tenth Ave., New York, N.Y. 10011.

Learn more about Personal Computing, Office Automation or Communications in these video journals from CW Communications and Deltak.

Personal Computing: A Business Perspective
Taped on location during CW Communications' COMPUTERWEEK conference, these six video sessions feature many of the biggest names in the microcomputer industry as they share their insights into the application of personal computers in the business environment. Each of the six tapes is 20-30 minutes long, and focuses on a specific issue. Available through Deltak singly or as a group.

- *Thinking Small for Big Business*
- *The Purchase Decision*
- *Finding a Vendor*
- *Sales Trends and IBM*
- *New Languages and Networking*
- *A Look Toward the Future*

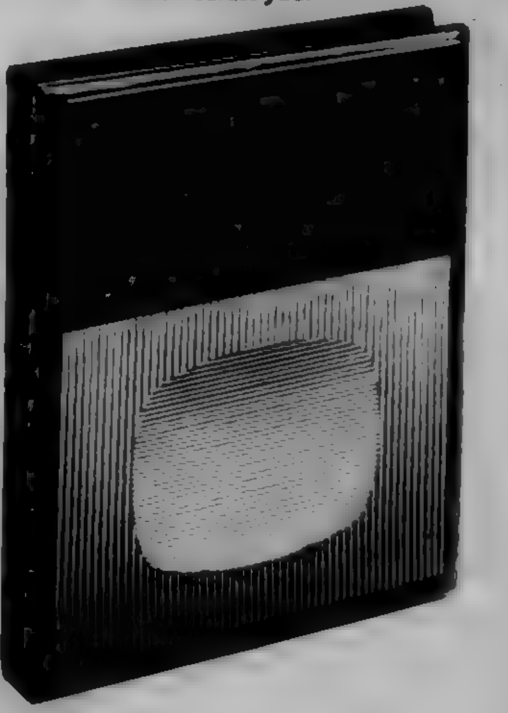
Office Automation: The Essential Issues
Last Fall, executives from around the country attended the OA Forum, a national conference conducted by CW Communications on the introduction, integration and implementation of office automation in today's business environment. Leading industry experts and top corporate managers discussed key office automation planning issues. These discussions are now available to you in seven carefully edited conference journals. Each journal is in full color, and 20-30 minutes long. They are available from Deltak singly or in a group.

- *The DP Role in Office Automation*
- *Planning for Office Automation*
- *The Fundamentals of Integration*
- *Some Specifics of Integration*
- *The Executive Workstation*
- *One Company's Experience*
- *Introducing Office Automation to Your Organization*

Communications
Leading experts in all areas of communications were recently taped at the 1983 Communication Networks Conference in New Orleans. Many hours of material are now being edited to produce a new conference journal series to be available in the late Spring through Deltak. Specific sessions are not yet decided, but overall topics will be:

- *Communication Networks*
- *Local Area Networks*

All of these useful journals are available through Deltak, Inc., 1751 Diehl Road, Naperville, IL 60566. To get more information, or to find out about rentals, just call Deltak Order-Entry at (312) 369-3000 (in Canada, (416) 678-9222), or check the white pages of your telephone directory for the Deltak office nearest you.



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POSITION ANNOUNCEMENTS

Somehow, Did Your Last Raise Seem Insignificant?

New, Free Computer Salary Survey!

Learn about compensation in the computer field, including the effects of inflation and recession, and which career paths offer the greatest compensation from a 28-page report prepared by Source Edp.

Despite past inflation and recession, demand for computer systems and the people needed to support them continues to grow.

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In our new Survey, you'll get answers to these questions and much more.

Compare your salary with many others.

The new Survey not only provides salary medians for 48 position categories, but it also shows "highs" and "lows" for each one as well. Figures are organized by types of professionals, including those ranging from commercial programmers to management and marketing positions; by experience level and by size of computer installation site.

So you'll be able to compare your salary with those computer professionals who have similar responsibilities and skills and to learn who in computing, in what kinds of specialized disciplines, are earning the most.

No other Survey we know of is more comprehensive. It's based on contacts with more than 50,000 professionals and 25,000 organizations.

Learn about new growth areas.

Most significantly, you'll also read about which specific areas of specialization are forecasted for unusual growth in this decade and beyond. The past year saw many changes in the economy and has altered career prospects for some professionals who were not properly prepared, so the need to stay abreast of current trends and career planning has never been so critical.

Whatever computer specialty you're in, or plan to explore—programming, software, systems design, data communications, mini/micro systems, data base, computer marketing, sales, management or others—our Survey can help you make the most of your career. You'll be able to keep up with changes in the profession, establish career goals, develop action plans, evaluate your progress, spot potential dangers, take corrective action when needed, and in general, keep your career on the best possible course for growth.

Call for your free copy.

The new *1983 Computer Salary Survey and Career Planning Guide* is available without charge. You owe it to yourself to get a copy of the report—especially if most of your career lies ahead of you.

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Torrance	213/540-7500
Van Nuys	213/781-4800
Colorado	
Denver	303/571-4460
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Washington D.C.	[illegible]
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Burlington	617/273-5160
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Responsibilities will include managing and coordinating the activities of 35 MIS support personnel in the development and implementation of state-of-the-art financial institution applications. The candidate will work closely with Senior Management and must have the ability to communicate effectively with Senior Management and major MIS users.

*Salary offer will be commensurate with your experience plus a competitive benefits package.

Qualified candidates are encouraged to send a confidential resume, including references, salary history and requirements to:

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Computerworld
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Research staff member sought for a position in the Laboratory for Computer Science. Will develop software for large and diverse group of computer systems, including DEC system 20 running TOPS-20, 25 or more VAX computers running UNIX or VMS., Apollo computers, LISP Machines, several Apple and IBM personal computers, as well as a variety of peripherals: laser printers, high resolution bit-map display systems, file servers, etc.

All equipment described connected with high bandwidth local area network. Position entails development of software to make existing computational environment more coherent and generally better for both new software development and running of applications programs.

Requires Bachelor's or Master's in Computer Science plus 1 to 2 years experience in operating systems such as UNIX, TOPS-20, VMS, etc. and computer networking. Hardware development background preferred.

Please submit 2 copies of resume (ATTN: Job No. R1002) to: MIT Personnel Office, E19-238, 77 Massachusetts Avenue, Cambridge, MA 02139. MIT is an equal opportunity/affirmative action employer.

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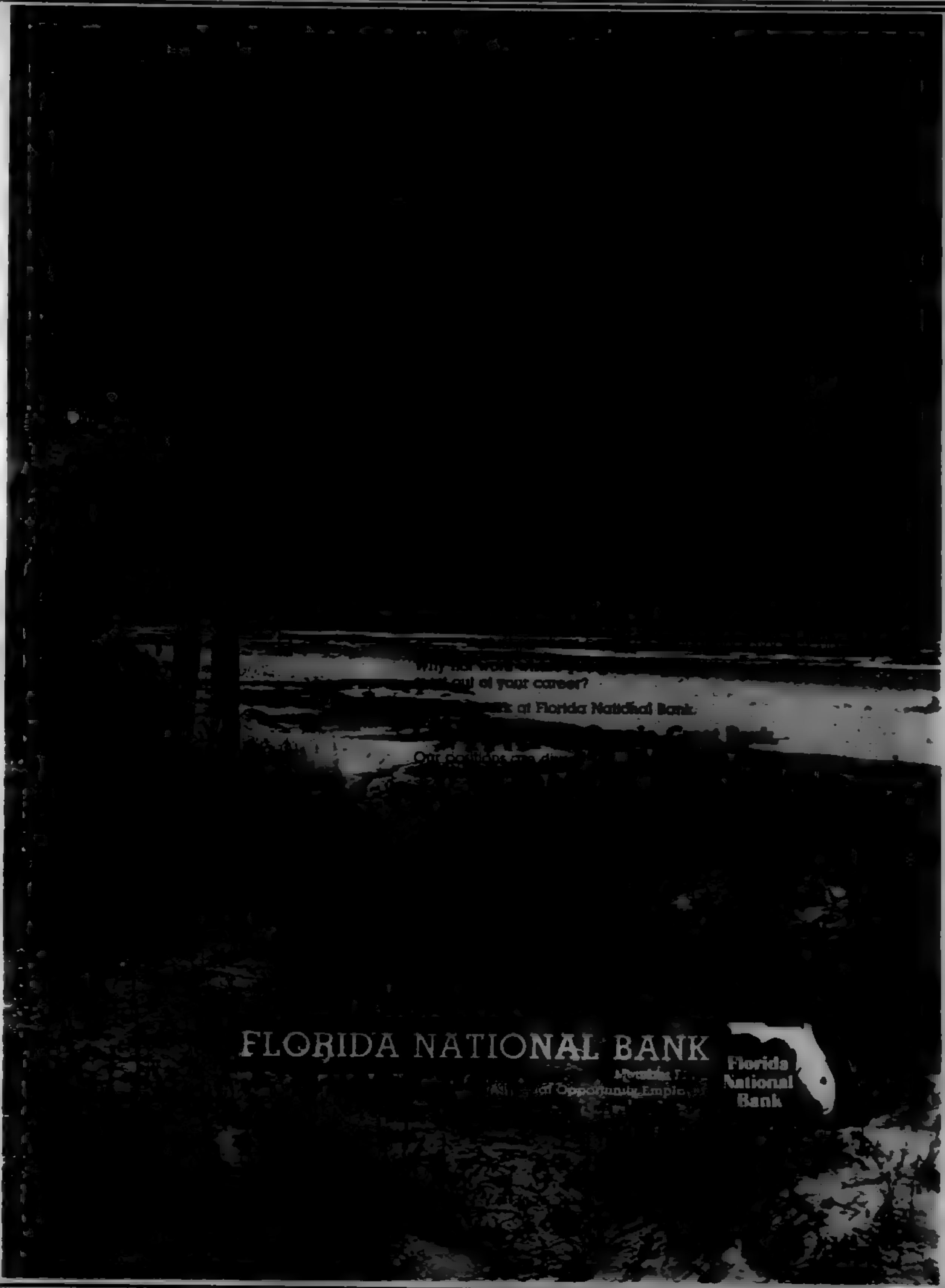

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Davidson College invites applications for the position of Director of its Computer Services Center. The director supervises a staff of seven professionals and the operation of two Prime computers (750 and I-1000), 61 terminals and printers, 5 microcomputers, 6 DEC word processors and communications with TUCC. This installation, begun in September 1981, is expanding in both hardware and software acquisitions as computer processing is used in new ways in the curriculum and the administration. The position requires a person with strong managerial, administrative and communicative skills to lead the college in developing new computer applications. Candidates should have a working knowledge of on-line computer systems, distributive processing, microcomputer systems and telecommunication techniques and a familiarity with database systems, text editing, and sources of material for academic instruction. The duties and responsibilities of the director include the overall supervision of the computer systems used for academic and administrative purposes, long-range planning for future system growth, and the direct supervision of the computer services staff. Knowledge of both academic and administrative computer services staff. Knowledge of both academic and administrative computer needs is important. A Ph.D. in a field appropriate for a liberal arts college and some teaching experience is desirable although not essential. Letters of application and nomination should be sent to Dr. T.C. Price Zimmermann, Vice President for Academic Affairs, Davidson College, Davidson, North Carolina 28036. Review of applications will begin April 15, 1983. Equal Opportunity Employer.

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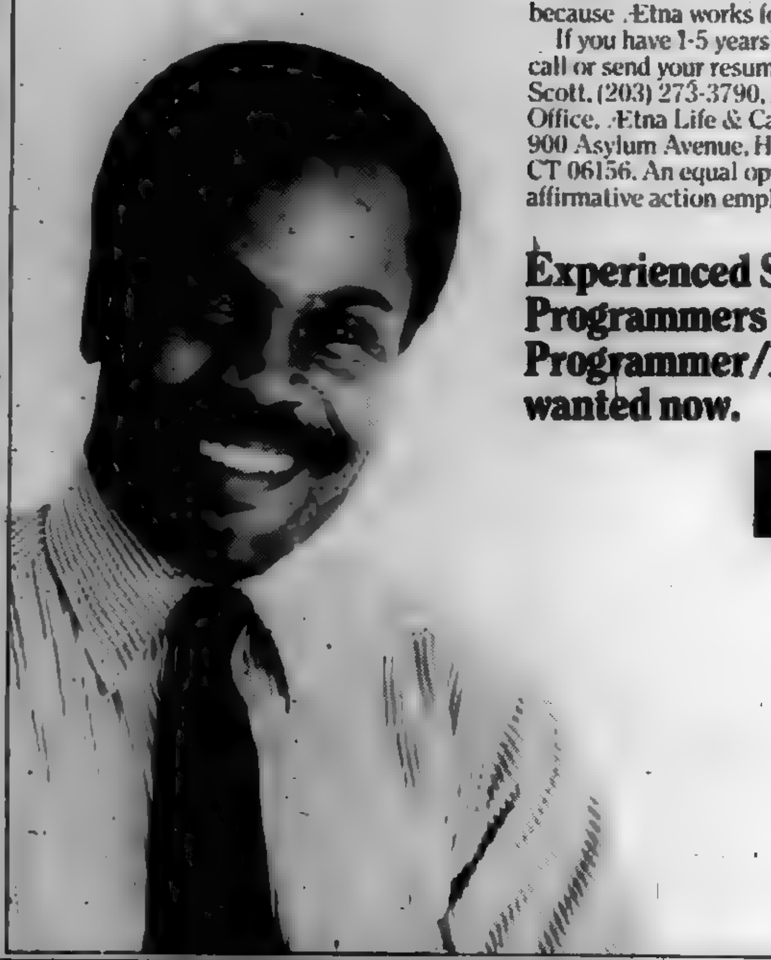

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Saint Joseph Hospital

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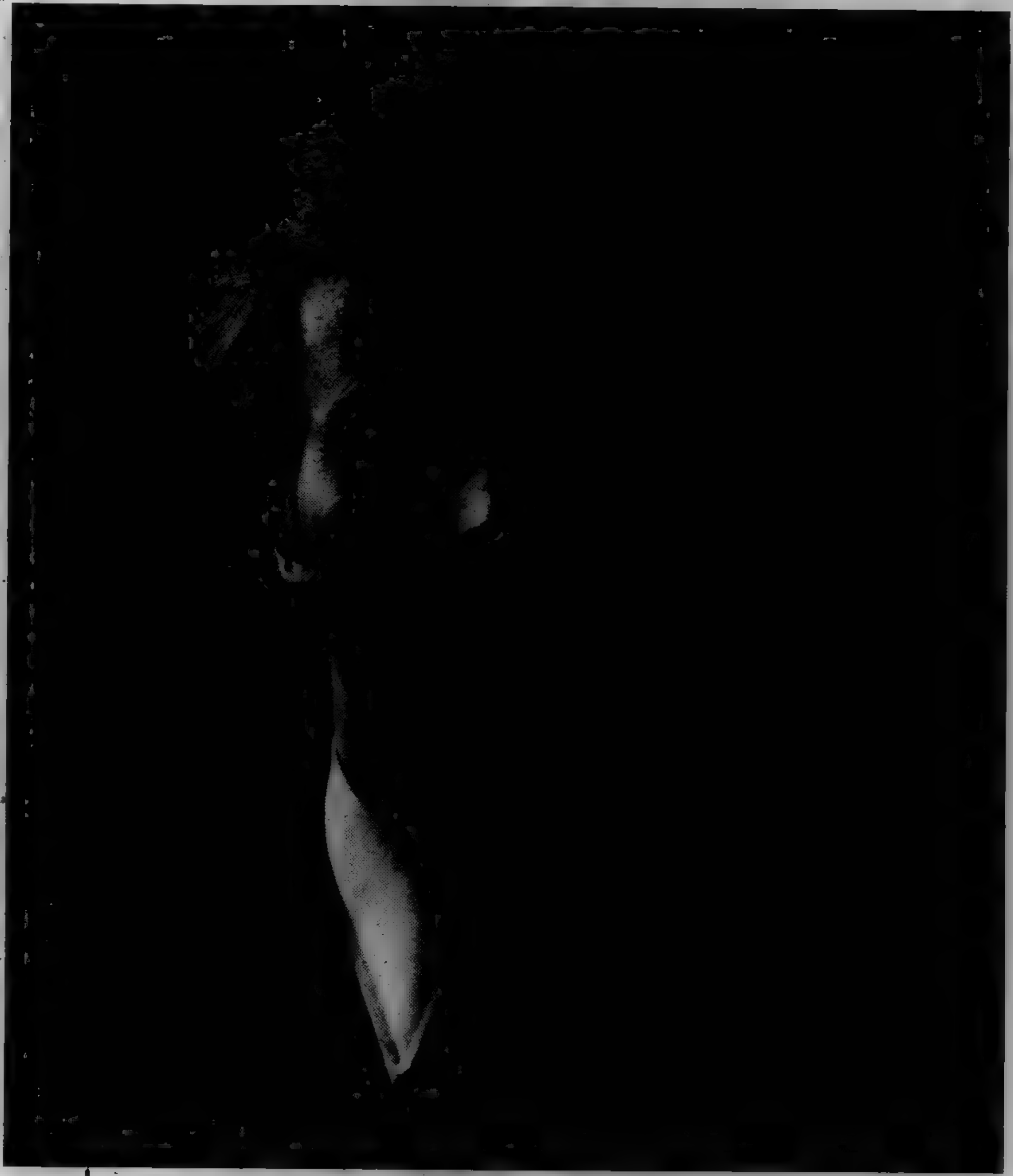

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Description:
Mature dp management or marketing professional with current high earnings. This person could be an independent businessperson, executive in a consulting environment, broker, technical/marketing director, salesperson or be posing in any number of disguises.

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Subject individual is currently generating significant revenues, either for himself or his employer, by managing, marketing, brokering, or selling any type of dp service or product. We want him or her to generate revenue and profits for the Professional Services area of Informatics using the methods he or she knows best.

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Please send your resume to D. Bridgeman, Apple Computer Inc., Dept. CW-3, MS16-B, 20525 Mariani Avenue, Cupertino, California 95014.

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GOULD

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- Degreed individuals with minimum of 3 years experience in the following areas: microprocessor firmware, SNA, packet and BISYNC protocols, computer networking and communications software applications.
- These senior level positions will concentrate on conceptualizing and defining the next generation of communications software and hardware systems to be developed by GOULD S.E.L. Candidates for these positions should have a minimum of seven (7) years experience in all above described discipline requirements, plus a solid understanding of the hardware-related aspects of designing cost effective solutions to tomorrow's communications problems. Will also be involved in feasibility studies pertaining to the communications area.

We offer excellent salaries and comprehensive benefits. For immediate and confidential consideration, send your resume, including salary history, to Sue Abbondante, Dept. CW328, **GOULD INC.**, S.E.L. Computer Systems Division, 6901 W. Sunrise Blvd., Ft. Lauderdale, FL 33313. An Equal Opportunity Employer, M/F/H.

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Higher Education Computer Network

The Wyoming Higher Education Computer Network (WHECN) is operated by the University of Wyoming to serve the instructional and administrative computing needs of the State's seven community colleges. Each college has substantial administrative and academic computers in addition to a connection to the CDC CYBER 730 and 760 computing facility at the University in Laramie. Two positions are available and will be filled as soon as qualified applicants are located.

Manager/Programmer

This position will report to the Director, Division of Computer Services, and will have the responsibility for coordinating all WHECN activities. Duties will include budget, recommendation and monitoring, planning, procurement, and coordinating maintenance and operation of the WHECN computing facilities. Programming support and analysis will also be required to ensure the highest quality computational service to the community colleges. The Manager will supervise two other professional personnel.

A bachelor's degree and proven excellence in verbal and written communications skills are required as is a broad technical knowledge and firsthand experience of computational requirements within an educational institution. Six years of related experience including two years of supervisory experience is necessary. An advanced degree is preferred.

A substantial amount of in-state travel will be necessary. Salary range is $25,392 to $38,088. Starting salary will not exceed $31,740.

Coordinator - Instructional User Services

This position will coordinate all academic computing activities for the seven Wyoming Community Colleges. This includes systems programming (compilers, operating systems), software and hardware installation, applications and package support, as well as consulting services to faculty and staff. Computer assisted instruction, graphics, and commonications are some of the most active projects.

A bachelor's degree in Computer Science or a related field, or an equivalent combination of education and experience is required. At least two years of related experience in computer use and application is necessary.

This position will require some travel within the state. Salary range is $21,336 to $32,004. Starting salary will not exceed $26,676.

These positions offer a full University benefit package. Location is in Laramie, a pleasant city with a population of 25,000 in the Rocky Mountain area and home of the University, which serves 10,000 full-time students in all disciplines.

Qualified candidates should forward their resumes, current salary information, and three references with telephone numbers to Charles A. Folkner, Director, Division of Computer Services, P.O. Box 3945 University Station, Laramie, Wyoming 82071.

The University is an Equal Opportunity/Affirmative Action Employer.

BUSINESS COMPUTER PROGRAMMING INSTRUCTOR:

Must have a Bachelors Degree and 1 and 1/2 years business experience or an equivalent combination of education and/or experience. Masters Degree and teaching experience preferred. Must have the ability to teach DOS/VSE, ICCF/CICS, VSE, VSAM, RPGII, data base, ALC, PASCAL, and systems analysis and design on an IBM 4331.

Direct responses to: Eastern Iowa Community College District, Personnel Dept., 2804 Eastern Avenue, Davenport, Iowa 52803.

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The manager we seek should have an academic background and professional interest sufficient to facilitate interaction with a diverse faculty. He/she should have work experience with computer usage in an academic environment. Excellent communication and organizational skills are required for maintaining active relationships with in-house computer support groups and with outside vendors of hardware and software.

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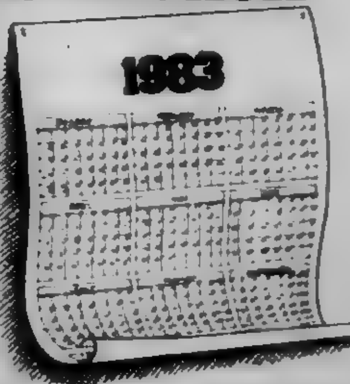

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Participate in the specification, design, debugging, testing and documentation of complex programs. Involvement includes networking operating systems. Requires 2-4 years' design experience demonstrating a working knowledge of Z-80, 8086, 68000 and/or C. Exposure to hardware design a plus.

Peripherals Development

Develop new peripheral software to run different applications and specialized arabic and scientific editors for a number of output devices including printers and typesetters. Requires 2-4 years' experience programming microprocessors and a working knowledge of PL/M and Z-80. BSCS or equivalent.

For the preceding positions, send resume with salary history (specifying position of interest) to Sam Keaton, Wang Laboratories, Inc., Dept. CW328, One Industrial Avenue, Lowell, MA 01851.

CAI SYSTEMS DEVELOPMENT

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Define and implement advanced CAI technology designed to support Wang office automation and data processing computer architectures. Will work with a small research oriented group, attempting to integrate voice, images, data and procedures for a state-of-the-art CAI product. Must be comfortable with firmware and hardware interfaces, and be capable of working with prototype systems. While the ultimate application is interactive education, you must have several years experience or education in systems programming. Interest or familiarity with authoring languages or a strong commitment to ergonomics and human engineering is important. Experience with, and interest in imaging technology, integrating video and graphics is desirable.

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Courseware Writer

Help shape courseware products by applying your expertise in course writing and the CAI authoring language. Implement the course design and production script by programming with the use of authoring tools, and writing/programming course material. Participate in new course development. Requires a minimum of 3 years' industry-related writing/training experience, an interest in programming, and familiarity with using application programs. Effective problem-solving and interpersonal skills required.

For the preceding positions, send resume with salary history (specifying position of interest) to Ellen Wyman, Wang Laboratories, Inc., Dept. CW328, One Industrial Avenue, Lowell, MA 01851.

If you're in the Boston area on Monday or Tuesday, March 28 & 29, plan to attend the Wang R&D Open House at Stouffer's Bedford Glen Hotel, 44 Middlesex Turnpike, Bedford, MA, from 6-9 p.m.

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Responsibilities include:

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Responsibilities include:

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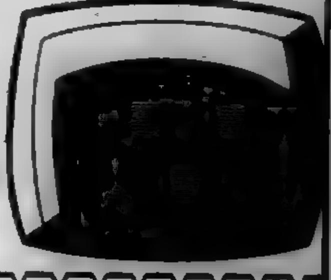

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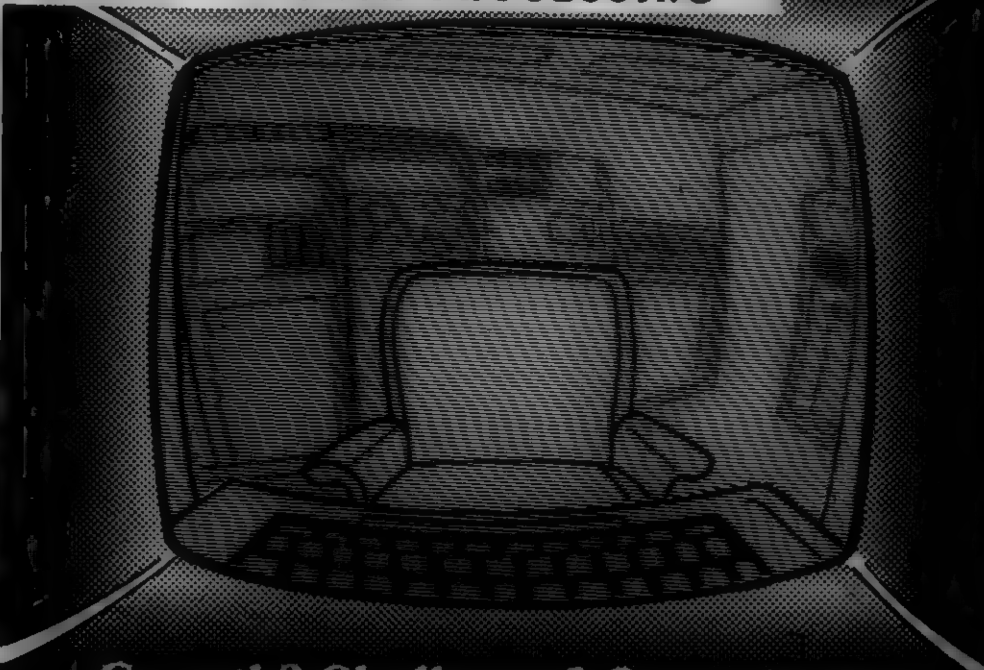

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AA/EOE

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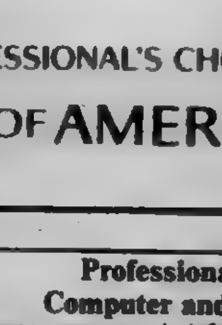
Dartmouth College



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iv) evaluating the obligation and performance of all financial, information processing, and other physical resources managed or monitored by the Department;

v) serving as a source of technical review and assessment capability, both for Departmental Managers and user community, for matters requiring resolution, modification, and development of altenative solutions and ensuring the implementation of the selected option.

MINIMUM REQUIREMENTS

1) Master's degree in Business or Public Administration or its equivalent.

2) Broad and extensive knowledge of financial, administrative, and technical management systems.

3) Experience in establishing and running a charge-back billing system in a complex organization setting.

4) Proven ability to manage in a complex, dynamic, project-oriented business environment, indicating good planning and organizational skills and an understanding for the need for controls, systems maintainance, and monitoring.

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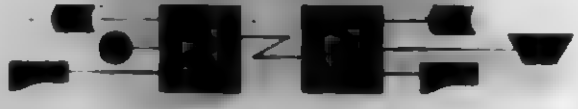

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University of the District of Columbia
Department of
Computer Information & Systems Science
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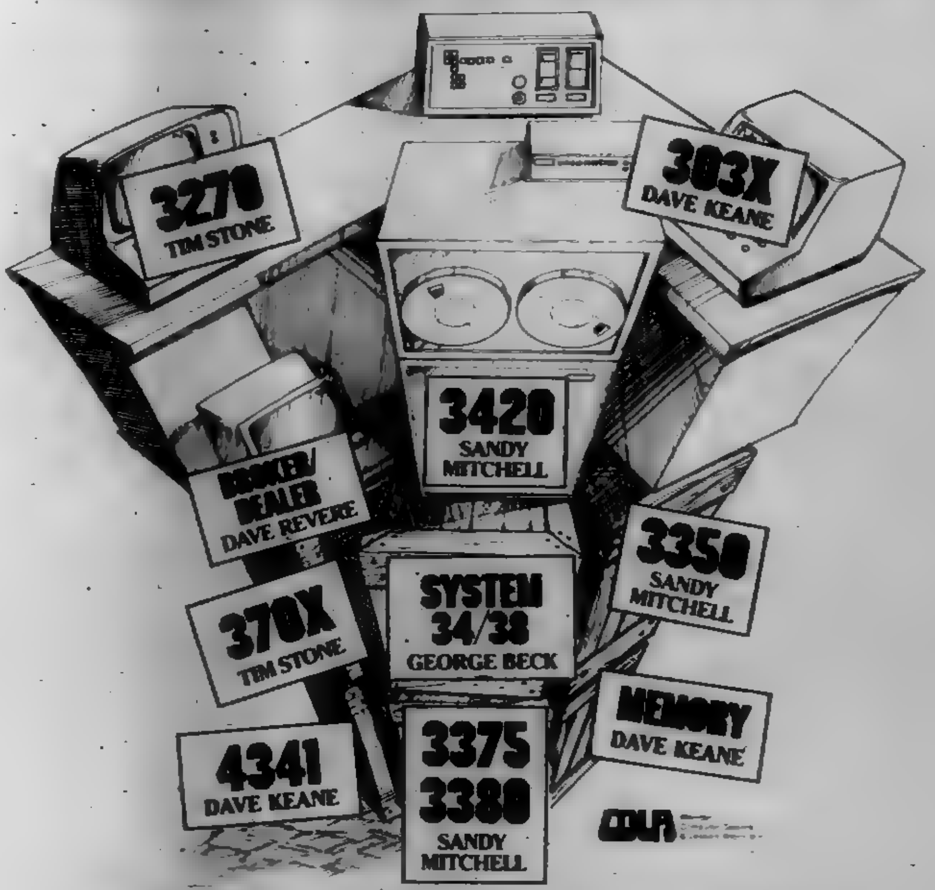

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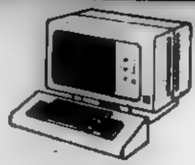

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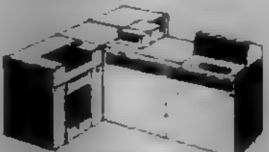

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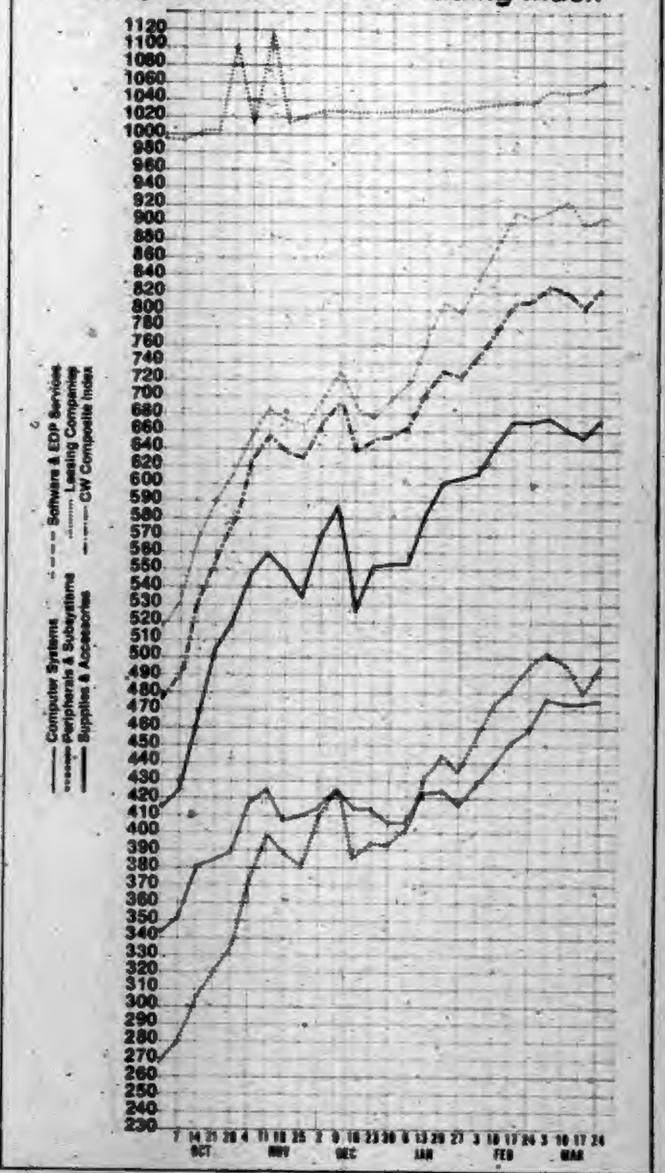
ADVERTISERS INDEX

Access Matrix ... SR/34-SR/35
Access Technology ... SR/15
Altos Computer ... 20-21
Aluminum Case Co. ... 80
Amer-Cal ... 92
Anchor Pad ... SR/24
Anderson Jacobson ... 94
Applied Computer Research ... 78
Applied Data Research ... 3
A.S.T. Research ... SR/36-SR/37
Auerbach Publishing ... 44
BASF ... SR/60
John Beall Company ... 101
BMC Software ... SR/27,SR/29
B.I. Moyle ... SR/8
Boole & Babbage ... 90-91
M. Bryce & Associates ... 45
Burroughs ... SR/16-SR/17
Bytek ... 10
CGA Computer Associates ... 103
CIE Systems ... SR/20-SR/21
CIE Terminals ... 88-89
Cincom Systems ... 34-35,37
Comdata ... 77
ComDesign ... 78
CompEd ... 100
Computer Enhancement ... SR/23
Computer Expo '83 ... 100
Computerland ... SR/18
Computer Management Research ... 81
Computer Office Systems ... 100
Computer Publications Inc. ... 80
Computerwoche ... 53
Computerworld Buyer's Guide ... SR/62
Computerworld Mexico ... 85
Computerworld Subscriptions ... 60
Computerworld Supplement ... ID/23
Concord Data Systems ... 38
Conference Management/DMW Group ... 46
Continental Resources ... SR/48
Control Concepts ... 83
Control Data Corp. ... 110
Cord Cable Co. ... 35
Corvus Systems ... SR/19
Cromemco, Inc. ... SR/39
CRWTH Computer Coursewares ... 111
CS Computer Systems ... ID/15
CW Deltak ... 115
CW On Communications ... 76
CXI, Inc. ... 84
Cylix ... 104-105
Dallas Market Center ... ID/16
Walter E. Daniels, P.A. ... 30
Data General ... 50-51,96-97
Datamation ... 22
Data Processing Design ... ID/11
Dataproducts ... 30
Dataroyal ... ID/24
Datasouth Computer Corp. ... 114
Datasphere ... 8
Decision Point, Inc. ... ID/10
Norm DeNardi Enterprises ... 65
Dialogue Research ... 95
Digilog ... 84
Digital Associates ... 92
Digital Equipment Corp./
—Educational Services ... 12-13
Digital Equipment Corp./
—Micro ... SR/44-SR/45
Digital Equipment Corp./
—NPM Peripherals ... 113
Digital Research ... SR/25
Dorlen Products ... 102
Duquesne Systems Inc. ... 61
Dysan Corp. ... 36
Eastman Kodak Co. ... 74-75
ECS Microsystems ... SR/63
EEC Systems ... 62
EPS Inc. ... SR/52
Floating Point Systems ... 80-81
Forte Data Systems ... SR/26
Four Phase Systems ... ID/6
Franklin Computer Corp. ... SR/40
Fusion Products ... ID/11
Future Software ... 42-43
Gejac, Inc. ... 37
General Research Corp. ... 47
General Systems ... 56
Giltronics ... SR/41
Hamilton Rentals ... 31
Hayes Microcomputer ... SR/10-SR/11
Hewlett-Packard ... 82
Tom Hopkins International ... 70
Human Designed Systems ... 109
IBEX II ... SR/42
IBM ... SR/61
Infodata Systems ... 9
Information Science Inc. ... 28-29
Informer Computer ... 26
Innovative Electronics ... 114
Intel ... 72-73
International Mobile Machines Corp. ... SR/64
IPL Systems ... 40-41
I.Q. Systems ... SR/38
ISSCO ... 66
Jones Futurex ... SR/42
KW Control Systems ... 108
Lear Siegler ... 106-107
Lee Data Corp. ... SR/56
Levi, Ray & Shoup, Inc. ... 69
Library Journal ... 23
Local Data ... 62
3M Company ... 48-49,112
MCBA ... 11
McCormack & Dodge ... 144
Memorex Corporation ... 52,98
Merlyn Corp. ... SR/35
MicroAge ... 19
Microcom ... SR/57
Micro Learning Concepts ... SR/30
Microrim ... SR/66
Mohawk Data Science ... 23,25,27
Money Magazine ... 32
MPPL Ltd. ... SR/52
Manager Software Products, Inc. ... 93
National Advanced Systems ... 64-65
National Computer Communications Corp. ... 7
NCR Corp. ... ID/8
NEC Info. Systems ... SR/59
Nestar ... SR/53
Newcorp Products ... 34
Newman Computer ... ID/3
North Star Computer ... SR/9
Ohio Scientific ... 16-17
Okidata ... SR/22
Omni Offices ... 20
O.S.M. Computers ... SR/12
Panasonic ... 18-19,ID/15
Para Research, Inc. ... 45
Perkin-Elmer ... 39
Phaser ... ID/13
Phaze Info. Machines Corp. ... ID/2
Popcom ... 38
Polygon Associates ... SR/47
Prentice Hall Inc, College Division ... 25
Professional Computer Resources ... ID/18
Professional Software Support ... SR/41
Programmatic Systems ... 66
Protocol Computers ... 68,69,70,71
Quadrum ... SR/31
QUME ... 22
3R Computer ... SR/28
Racal Vadic ... ID/12
RD Labs, Inc. ... 24
Reference Magazine ... SR/14
L.F. Rothschild ... 59
Rogue River Software ... 89
SAS Institute ... SR/32-SR/33,63
Saturn Systems ... 95
SDI ... ID/10
Shand, Morahan & Co. ... ID/3
Signal Technology ... 62
Softronics ... SR/47
Software AG ... 33
Software Assistance ... 83
Southern Systems ... 111
Sperry Univac ... 67
SPSS, Inc. ... 47
Storage Technology ... 86
Stratus Computer ... 79
System Development ... SR/38
Systems Documentation, Inc. ... SR/42
System Strategies ... 78
Tandem Computers ... ID/4-ID/5
Techland Systems ... 102
Technical Analysis Corp. ... SR/34
Telemetrix, Inc. ... 36
Televideo Systems ... 56-57,SR/4-SR/5
Telex ... ID/22
Term-Tronics, Inc. ... 94
Tominy ... SR/30
Tone Software ... 78
Triangle Software ... ID/17
Ungermann-Bass ... ID/21
Uniq Computer Co. ... ID/14A
United Telecom Computer Group ... 99
U.S. Data Systems ... SR/7
U.S. Robotics, Inc. ... SR/8
Ven-tel ... SR/43
Walker Interactive Products ... 3
Wang Laboratories ... ID/8,99
Whitesmith Ltd. ... SR/49
Wolfe Computer Testing ... 33
World Wide Business Centers ... ID/2
WYSE Technology ... ID/20
Zentec ... SR/50-SR/51
Zilog, Inc. ... SR/76
Zytron ... SR/46

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Computerworld Stock Trading Index



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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, MARCH 23, 1983

All statistics compiled
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TRADE QUOTES, INC
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EXCH		PRICE 1982-83 RANGE (1)	CLOSE MAR 23 1983	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
A	AMDAHL CORP	17- 44	43 1/2	+4 3/8	+11.1
N	BURROUGHS CORP	28- 48	45 7/8	+ 3/8	+0.8
O	COMPUTER AUTOMATION	7- 17	13 3/8	-1 3/8	-9.3
N	CONTROL DATA CORP	21- 51	48 1/8	+2	+4.2
N	CRAY RESEARCH INC	20- 48	43 5/8	+2 3/8	+5.7
N	DATA GENERAL CORP	20- 61	58	+5 1/8	+8.5
N	DATAPOINT CORP	11- 38	23 1/4	+ 5/8	+2.7
N	DIGITAL EQUIPMENT	82-132	127 1/4	+1 3/4	+1.3
A	ESCO INC	8- 12	11 7/8	+ 3/4	+6.7
N	ELECTRONIC ASSOC.	5- 12	10 1/8	+ 3/4	+8.0
N	FLOATING POINT SYST	18- 37	35	+1 1/2	+4.4
N	FOXBORO	22- 43	37 1/8	+ 5/8	+1.7
O	FULCRUM COMP GRP	1- 3	1/4	0	0.0
O	GENERAL AUTOMATION	3- 8	8 1/2	+ 1/8	+1.8
N	HARRIS CORP	20- 51	45 3/4	+1 1/2	+3.3
N	HEWLETT-PACKARD CO	36- 87	83 1/8	+2 1/2	+3.1
N	HONEYWELL INC	60-104	95	+ 1/2	+0.5
N	IBM	57-103	102 1/8	+3 1/4	+3.2
O	IPL SYSTEMS INC	5- 11	8 1/4	+ 1/4	+3.1
O	MAGNUSON COMP SYSTS	2- 5	3	0	0.0
N	MANAGEMENT ASSIST	7- 18	18 1/2	+ 7/8	+5.2
O	MINI-COMPUTER SYST	1- 2	1	0	0.0
N	MODULAR COMPUTER SYS	8- 15	10 1/8	-1 1/2	-12.8
N	MOHAWK DATA SCI	10- 18	16 7/8	+1 3/8	+8.8
N	NCR	38-113	112 3/4	+7 1/4	+6.8
N	PERKIN-ELMER	17- 33	28 1/2	+ 1/4	+0.8
N	PRIME COMPUTER INC	18- 45	42 3/4	+3	+7.5
N	SPERRY CORP	21- 38	35 3/8	+1 1/4	+3.6
O	TANDEM COMPUTERS INC	14- 34	27 1/4	+1 1/2	+5.8
N	TEXAS INSTRUMENTS	71-175	168 1/8	+7 1/8	+4.4
A	WANG LABS "B"	13- 37	33 1/2	+2 1/2	+8.0
A	WANG LABS "C"	11- 37	33 1/2	+2 1/2	+8.0
	LEASING COMPANIES				
O	BOOTHE FINANCIAL CP	22- 35	32 1/2	+ 1/4	+0.7
N	COMDISCO INC	7- 26	24 1/4	+1 3/8	+6.0
B	COMMERCE GROUP CORP	1- 1	3/8	+ 1/8	+50.0
O	COMPUTER INVSTRS GRP	1- 2	1/2	0	0.0
O	CONTINENTAL INFO SYS	9- 21	20 1/2	+ 1/2	+2.5
N	DPF INC	8- 14	12	0	0.0
O	ITEL	1- 3	1	0	0.0
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	18- 41	40 1/2	+ 1/2	+1.2

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON;
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
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EXCH		PRICE 1982-83 RANGE (1)	CLOSE MAR 23 1983	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 4	3 3/4	- 1/4	-6.2
O	ADVANCED SYSTEMS INC	8- 24	21 3/4	+ 3/4	+3.5
O	AGS COMPUTERS INC	7- 22	17 1/2	- 3/4	-4.1
N	ANACOMP INC	8- 22	21 7/8	+2 3/8	+12.1
O	ANALYSTS INTL CORP	5- 10	10	+1	+11.1
A	APPLIED DATA RES.	18- 50	50 1/4	+2 1/8	+4.4
O	ASK COMPUTER SYSTEMS	12- 35	28 7/8	+ 3/8	+1.2
O	ASTRADYNE COMP IND	1- 5	4 3/4	+1	+26.6
N	AUTOMATIC DATA PROC	21- 40	38 1/4	- 1/4	-0.6
O	CGA COMPUTER ASSOC	9- 14	13 3/4	- 1/2	-3.5
O	COMPUTER ASSOC INT'L	12- 47	40 1/4	0	0.0
O	COMPUTER HORIZONS	2- 12	17	+2 1/2	+17.2
O	COMPUTER NETWORK	4- 10	8 1/2	+ 5/8	+7.9
N	COMPUTER SCIENCES	11- 23	19 7/8	0	0.0
O	COMPUTER TASK GROUP	8- 19	19 3/4	+ 1/4	+1.3
O	COMPUTER USAGE	2- 22	18 1/4	-3 1/4	-15.5
O	COMPUTONE SYSTEMS	15- 38	24	-7	-22.5
O	COMSERV CORP	11- 20	16	- 1/4	-1.5
O	COMSHARE	8- 13	11 1/4	- 1/4	-2.1
A	CULLINET SOFTWARE	12- 35	32	+1 1/4	+4.0
O	CYCARE SYSTEMS INC	9- 18	16 3/8	0	0.0
O	DATA DIMENSIONS INC	1- 2	1/4	0	0.0
O	DATATAB	0- 2	5/8	- 1/8	-16.6
O	DYATRON CORP	2- 4	3 1/2	0	0.0
N	ELECTRONIC DATA SYST.	13- 38	37 3/4	- 1/4	-0.6
N	INFORMATICS INC	10- 28	28 3/4	+1 1/4	+4.5
O	INSYTE CORP	1- 3	1 7/8	0	0.0
O	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	4- 8	7 1/2	0	0.0
A	LOGICON	12- 36	35 3/4	+ 1/2	+1.4
O	MGMT SCI AMER INC	8- 28	23 1/4	+ 1/4	+1.0
O	MATHEMATICA INC	12- 22	18 1/2	+ 1/4	+1.3
O	MATHEMATICAL APP GRP	12- 22	19 1/2	0	0.0
O	NATIONAL DATA CORP	5- 24	20 1/2	- 1/2	-2.3
O	PANSOPHIC SYSTEMS	8- 25	23 1/4	- 1/4	-1.0
N	PLANNING RESEARCH	5- 18	15 1/4	+1 3/8	+9.8
O	PROGRAMMING & SYS	1- 4	3 1/8	- 3/8	-10.7
N	REYNOLDS & REYNOLD	17- 38	36 3/4	+ 1/2	+1.3
O	SEI CORP	11- 23	21 5/8	+ 1/8	+0.5
O	SHARED MEDICAL SYST	13- 35	34 1/8	+3 1/8	+10.0
O	SCIENTIFIC COMPUTERS	8- 13	12 1/4	- 1/4	-2.0
O	SOFTWARE AG	5- 17	8 7/8	- 3/8	-4.0
N	TYMSHARE INC	12- 30	23	+ 3/8	+1.6
A	URS CORP	5- 14	13 1/4	+ 1/2	+3.8
N	WYLY CORP	7- 13	12 5/8	+ 7/8	+7.4
	PERIPHERALS & SUBSYSTEMS				
P	AM INTERNATIONAL	2- 4	3 1/2	+ 1/8	+3.7
A	ANDERSON JACOBSON	8- 38	18 1/2	+ 1/2	+2.7
O	AUTO-TROL TECHNOLOGY	9- 21	14 3/8	- 5/8	-4.1
O	BANCTEC INC	7- 33	17 3/4	+1	+5.9
A	BEEHIVE INT'L	4- 11	10 3/8	+ 3/8	+3.6
A	BOLT,BERANEK & NEW	13- 40	35	+1	+2.9
O	CAMBEX CORP	1- 4	1 3/4	- 1/4	-12.5
N	CENTRONICS DATA COMP	8- 20	17 7/8	+ 1/4	+1.4
N	CETEC CORP	4- 9	9 1/8	+1 1/4	+15.8
O	COGNITRONICS	2- 14	12	+ 3/8	+3.2
O	COMPUTER COMMUN.	1- 2	1 3/8	0	0.0

EXCH		PRICE 1982-83 RANGE (1)	CLOSE MAR 23 1983	WEEK NET CHNGE	WEEK PCT CHNGE
A	COMPUTER CONSOLES	15- 44	38 1/4	-2 1/8	-5.5
O	COMPUTER DEVICES INC	4- 21	14 1/2	+ 7/8	+6.4
O	COMPUTER TRANSCEIVER	4- 9	8 1/8	+ 3/4	+9.8
N	COMPUTERVISION CORP	18- 45	41 1/8	+1 3/8	+3.4
N	CONRAC CORP	21- 38	32 7/8	+1 7/8	+6.0
A	DATA ACCESS SYSTEMS	1- 4	1 1/2	0	0.0
A	DATAPRODUCTS CORP	10- 41	22 5/8	+2 5/8	+13.1
A	DATARAM CORP	5- 12	11 3/4	+1 1/2	+14.6
O	DATUM INC	2- 12	11 3/4	+2	+20.5
O	DAVID JAMISON CARLYL	2- 7	3 7/8	- 3/8	-8.8
O	DECISION DATA COMPUT	3- 14	10 3/4	0	0.0
O	DELTA DATA SYSTEMS	1- 4	3 1/4	+ 1/8	+4.0
N	ELECTRONIC M & R	5- 10	10	+1	+11.1
O	EVANS & SUTHERLAND	18- 50	42	+ 1/8	+0.3
O	GANDALF TECHNOLOGIES	10- 22	16	- 3/8	-2.2
N	GEN'L DATA COMM IND	6- 18	14 7/8	-1 3/4	-10.5
O	GENERAL TERMINAL CP	0- 2	7/8	+ 1/8	+16.6
O	GREAT SOUTHWEST IND	2- 6	3	0	0.0
N	HAZELTINE CORP	22- 64	63 3/4	+5 7/8	+10.1
O	ICOT CORP	3- 10	8 3/4	+2 1/8	+28.8
O	INFORMATION INTL INC	10- 22	18	- 3/4	-3.7
O	INTEL CORP	21- 48	47 1/2	+ 1/4	+0.5
O	IPL SYSTEMS INC	5- 11	8 1/4	+ 1/4	+3.1
A	LUNDY ELECTRONICS	7- 18	13 3/4	+ 3/4	+5.7
A	MSI DATA CORP	14- 36	18 7/8	0	0.0
O	NETWORK SYSTEMS CORP	15- 43	38 1/2	- 3/4	-1.8
O	OMEX	3- 5	3 1/2	0	0.0
N	PARADYNE CORP	18- 34	34 5/8	+2 5/8	+11.6
A	PENRIL CORP	7- 13	11 3/8	-1 1/8	-9.0
O	QANTEX CORP	[illegible]- 28	22 1/4	+ 1/2	+2.2
N	RECOGNITION EQUIP	4- 13	8 7/8	- 3/8	-3.6
O	SCAN DATA	1- 3	1 3/8	0	0.0
N	STORAGE TECHNOLOGY	15- 33	22 1/4	+ 5/8	+2.8
O	SYKES DATATRONICS	6- 27	10 3/8	+1 3/4	+20.0
A	T BAR INC	7- 14	12 3/8	+ 3/8	+3.1
A	TAB PRODUCTS CO	8- 25	24 1/2	+1 3/4	+7.6
A	TEC INC	8- 12	7 7/8	- 1/4	-3.0
N	TEKTRONIX INC	38- 75	68 3/8	+ 1/8	+0.1
N	TELEX	5- 27	24	+1	+4.3
O	TESDATA SYSTEMS CP	3- 10	9	+ 7/8	+10.7
N	TIMEPLEX INC	7- 24	18	-1 1/8	-5.9
O	VISUAL TECHNOLOGY	8- 20	18 1/4	- 1/4	-1.2
O	WILTEK INC	1- 3	2 1/2	- 3/8	-13.0
	SUPPLIES & ACCESSORIES				
N	AMERICAN BUS PRODS	11- 32	30	- 5/8	-2.0
B	BALTIMORE BUS FORMS	1- 2	1	0	0.0
N	BARRY WRIGHT	13- 25	24 3/4	- 1/4	-1.0
O	CYBERMATICS INC	1- 1	1 1/4	0	0.0
A	DUPLEX PRODUCTS INC	12- 21	20 3/8	- 1/8	-0.6
N	ENNIS BUS. FORMS	18- 33	32 5/8	+1 1/8	+3.5
N	3M COMPANY	48- 82	80	+2	+2.5
N	MOORE CORP LTD	28- 47	46 3/4	0	0.0
N	NASHUA CORP	8- 18	13 1/4	- 5/8	-4.5
O	STANDARD REGISTER	30- 68	63	0	0.0
N	WALLACE BUS FORMS	33- 58	52 1/2	0	0.0

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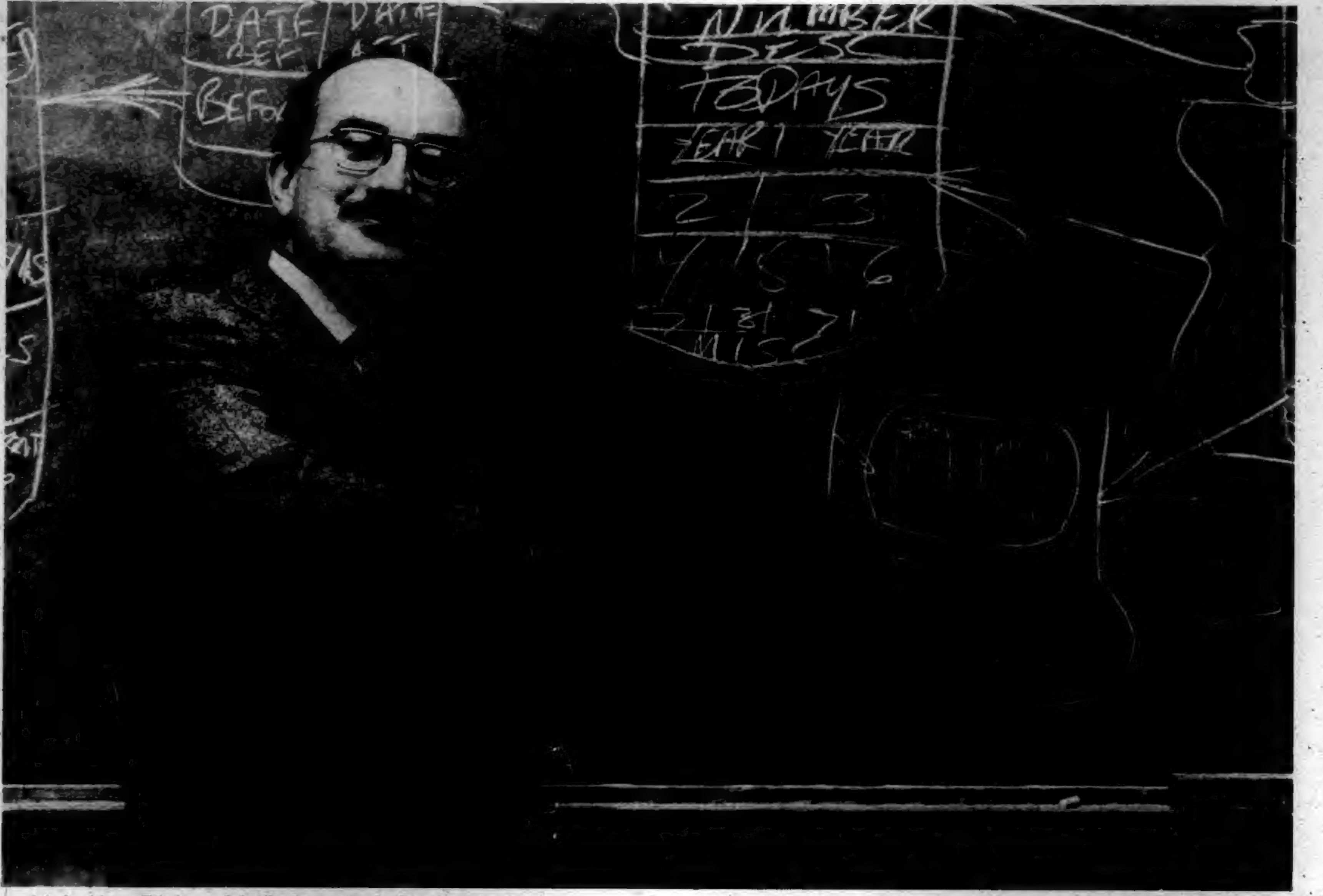

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